ONGOING MONITORING REPORT, OCTOBER 2023 – MARCH 2024

Robertson Barracks

Department of Defence

Reference: 754-MELEN338204

30 July 2025

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Restriction on Disclosure and Use of Data

This report and conclusions must be read in the context of the limitations described in “Important information about your Tetra Tech Coffey Environmental Report” in Appendix F.

EXECUTIVE SUMMARY[1]

Background

The Department of Defence (Defence) historically used aqueous film-forming foams (AFFF) containing per- and poly-fluoroalkyl substances (PFAS) in firefighting and fire training activities at Robertson Barracks (the base) in the Northern Territory (NT). As a result, PFAS has contaminated soils and is moving off the base in surface water and to a lesser extent, groundwater.

Defence undertook an investigation into PFAS at Robertson Barracks in 2018. A Detailed Site Investigation (DSI) report and Human Health and Ecological Risk Assessment (HHERA) reports were prepared. Defence used these reports to develop the PFAS Management Area Plan (PMAP) which summarises how Defence will manage PFAS at the base. The PMAP includes an Ongoing Monitoring Plan (OMP) to monitor changes in PFAS at the base.

Objective

The objective of the OMP is to monitor changes in PFAS concentrations in groundwater and surface water at and around Robertson Barracks to help Defence manage PFAS contamination.

PFAS Management Area

The PFAS Management Area (as shown in Figure 1, Appendix A) includes the base, the southern drainage channel leading to Milners Creek, and part of the Close Training Area (CTA) to the east of Thorngate Road, and the Shoal Bay Receiving Station (SBRS), where groundwater is used for drinking water supply.

Three PFAS source areas are present on the base where historic use of PFAS containing firefighting foams has occurred leading to contamination of soils including:

- **Source Area 1**: The Emergency Response Squadron (ERS) historically used this source area in the northeast of Robertson Barracks. The ERS stored concentrated AFFF and tested fire-fighting equipment.
- **Source Area 2:** The ERS parked their firefighting trucks in this area prior to their move to Source Area 1.
- **Source Area 3:** Underground storage tank (UST) refuelling area and wash down bays where fire-fighting tankers may have been used for wash down or testing using PFAS containing foams.

Ongoing Monitoring Report

Tetra Tech Coffey was engaged by Defence to prepare this Ongoing Monitoring Report (OMR) to summarise the groundwater and surface water sampling completed by AECOM Australia Pty Ltd (AECOM) between October 2023 and March 2024. The following sampling events are discussed in this OMR:

- **Groundwater monitoring:** October 2023 and March 2024
- **Surface water sampling:** November 2023, December 2023, and March 2024

Interpretive Analysis

PFAS concentration data collected during this reporting period were compared with historical results to assess changes in contamination trends over time.

PFAS concentrations remain within the same order of magnitude as historical data, with the highest concentrations measured near the PFAS source areas. Statistical analysis indicated that most PFAS concentrations were stable, or no trend was observed in groundwater PFAS concentrations with time. Seasonal variations in PFAS concentrations were observed, particularly in surface water following high rainfall events.

[1] This executive summary must be read in the context of the full report and the attached limitations.

Groundwater Results

Groundwater at Robertson Barracks flows to the east and northeast.

The highest PFAS concentrations in groundwater continue to be associated with identified source areas, particularly Source Area 1 (MW066), where the sum of perfluorooctane sulfonic acid and perfluorohexane sulfonic acid (sum of PFOS+PFHxS) was detected at a maximum of 0.36 µg/L.

PFAS concentrations outside the source areas remain consistent with previous results. No new exceedances of human health guidelines for drinking water were recorded during the reporting period.

Statistical trend analysis of sum of PFOS+PFHxS concentrations in MW034 showed an increasing trend, however, most monitoring wells confirmed stable trends.

What is an order of magnitude?

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

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

At the end of the wet season, concentrations increase in the Source Area 1 monitoring wells, suggesting mobilisation of PFAS from soils in the source area. However, concentrations decrease in the Northern and Southern monitoring wells at the same time, indicating a dilution effect and demonstrating that the increased concentrations in Source Area 1 are not resulting in off-base impacts. Given the tropical climate, the magnitude of rainfall variability between the dry and wet seasons is substantial, which likely contributes to the observed seasonal changes in PFAS concentrations.

Surface Water Results

PFAS concentrations in surface water were consistent with historical data and exhibited seasonal variations similar to previous years. Lower concentrations of sum of PFOS+PFHxS were reported at the end of the wet season indicating dilution is occurring as a result of increased rainfall and runoff. Despite these fluctuations, concentrations in surface water remained below health-based recreational guidelines, indicating no immediate change to the existing risk profile.

Conclusions

The findings of this OMR indicate that PFAS concentrations in groundwater and surface water remain consistent with previous assessments. The conceptual site model (CSM) was reviewed in light of this data, and no changes to the risk profile were identified.

Ongoing monitoring under the OMP will continue to track PFAS concentrations and potential risks to human health and the environment.

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ACRONYMS/ABBREVIATIONS

PER- AND POLY-FLUOROALKYL SUBSTANCES

Acronym/Abbreviation	Definition
Perfluoroalkane sulfonic acids (PFSAs)	
PFBS	Perfluorobutane sulfonic acid
PFPeS	Perfluoropentane sulfonic acid
PFHxS	Perfluorohexane sulfonic acid
PFHpS	Perfluoroheptane sulfonic acid
PFOS	Perfluorooctane sulfonic acid
PFDS	Perfluorodecane sulfonic acid
Perfluoroalkyl carboxylic acids (PFCAs)	
PFBA	Perfluorobutanoic acid
PFPeA	Perfluoropentanoic acid
PFHxA	Perfluorohexanoic acid
PFHpA	Perfluoroheptanoic acid
PFOA	Perfluorooctanoic acid
PFNA	Perfluorononanoic acid
PFDA	Perfluorodecanoic acid
PFUnDA	Perfluoroundecanoic acid
PFDoDA	Perfluorododecanoic acid
PFTrDA	Perfluorotridecanoic acid
PFTeDA	Perfluorotetradecanoic acid
Perfluoroalkyl sulfonamides	
FOSA	Perfluorooctane sulfonamide
MeFOSA	N-Methyl perfluorooctane sulfonamide
EtFOSA	N-Ethyl perfluorooctane sulfonamide
MeFOSE	N-Methyl perfluorooctane sulfonamidoethanol
EtFOSE	N-Ethyl perfluorooctane sulfonamidoethanol
MeFOSAA	N-Methyl perfluorooctane sulfonamidoacetic acid
EtFOSAA	N-Ethyl perfluorooctane sulfonamidoacetic acid
(n:2) Fluorotelomer sulfonic acids	
4:2 FTS	4:2 Fluorotelomer sulfonic acid
6:2 FTS	6:2 Fluorotelomer sulfonic acid
8:2 FTS	8:2 Fluorotelomer sulfonic acid
10:2 FTS	10:2 Fluorotelomer sulfonic acid

Acronym/Abbreviation	Definition
AFFF	Aqueous Film-Forming Foam
ASC NEPM	National Environment Protection Measure (Assessment of Site Contamination)
BOM	Bureau of Meteorology
CSM	Conceptual Site Model
CSR	Contaminated Site Register
CTA	Close Training Area
Defence	Department of Defence
DO	Dissolved Oxygen
DSI	Detailed Site Investigation
ERS	Emergency Response Squadron
FSANZ	Food Standards Australia New Zealand
HEPA	Heads of Environment Protection Authority
HHERA	Human Health and Ecological Risk Assessment
LOR	Limit of Reporting
MTR	Marksmanship Training Range
NATA	National Association of Testing Authorities
NEMP	PFAS National Environmental Management Plan
NHMRC	National Health and Medical Research Council
NT	Northern Territory
OMP	Ongoing Monitoring Plan
OMR	Ongoing Monitoring Report
PFAS	Per- and Poly-fluoroalkyl Substances
PMAP	PFAS Management Area Plan
QA	Quality Assurance
QC	Quality Control
RPD	Relative Percent Difference
SAQP	Sampling and Analysis Quality Plan
SBRS	Shoal Bay Receiving Station
SWL	Standing Water Level
Tetra Tech Coffey	Tetra Tech Coffey Pty Ltd
UST	Underground Storage Tank

UNITS OF MEASUREMENT

Acronym/Abbreviation	Definition
kg	kilogram(s)
km^2	square kilometre(s)
L	litre(s)
m	metre(s)
m AHD	metres Australian Height Datum
m BTOC	metres below top of casing
mg	milligram(s)
mg/L	milligrams per litre
µg	microgram(s)
µg/L	micrograms per litre
µg/kg	micrograms per kilogram
µS/cm	microsiemens per centimetre

1. INTRODUCTION

Tetra Tech Coffey Pty Ltd (Tetra Tech Coffey) was engaged by Department of Defence (Defence) to prepare this Ongoing Monitoring Report (OMR) for Robertson Barracks (the base), Northern Territory (NT). The location of the base is presented in Figure 1, Appendix A.

This OMR summarises the results of ongoing groundwater and surface water sampling undertaken by AECOM between October 2023 and March 2024 (the reporting period) within the Robertson Barracks PFAS Management Area, as well as groundwater sampling from selected bores within Shoal Bay Receiving Station (SBRS) north of the base. The location of the Management Area and SBRS are presented in Figure 1, Appendix A. This report includes comparisons to previously collected data and provides interpretation of the monitoring results.

1.1 BACKGROUND

Defence undertook extensive investigations into PFAS at the base in 2018, as documented in the Robertson Barracks Detailed Site Investigation ([DSI] Senversa, 2018a) Senversa, 2018a) and Human Health and Ecological Risk Assessment (HHERA) (Senversa, 2018b) ('the investigation reports').

These investigations assessed the potential risks posed by PFAS to human health and environment both on and around the base. The findings of the investigations led to the preparation of a PFAS Management Area Plan (PMAP), which summarised Defence's plans to manage PFAS moving off the base in groundwater and surface water. The PMAP included an ongoing monitoring plan (OMP) to monitor changes in PFAS concentrations in surface water and groundwater.

The OMP describes how groundwater, surface water and sediment are to be sampled at and around the base. The monitoring program includes sampling during both the wet and dry seasons to measure how PFAS movement changes under different climate conditions.

1.2 PURPOSE AND OBJECTIVES

The objective of the ongoing monitoring program is to continue to assess changes in the concentrations and extent of PFAS within the environment, where Defence's previous use of PFAS containing aqueous film-forming foam (AFFF) for firefighting has led to a potentially elevated risk to receptors, or potential future risk to receptors.

The objective of the OMR is to assess the changes in the extent, concentration and transport (pathways and flow rates) of PFAS and compare the results against human health and ecological guidelines and historical data to provide:

- A basis for targeted and effective risk management decision-making to protect human and environmental receptors.
- An early warning of changes in the extent of PFAS contamination where additional management may be required.

1.3 SCOPE OF ONGOING MONITORING REPORT

The scope of works for this OMR included assessing changes to the extent of PFAS in groundwater and surface water during the reporting period (October 2023 through March 2024) compared to historical data, and assessing potential changes to the conceptual site model (CSM) and risk profile at the base using data collected by AECOM.

The following sampling events were included as part of this OMR:

- Groundwater monitoring completed in October 2023 and March 2024.
- Surface water sampling completed in November 2023, December 2023 and March 2024.

Data was evaluated from the following OMP factual reports (included in Appendix B):

- Sampling Event Factual Report, Dry Season 2023, PFAS OMP Robertson Barracks, 21 March 2024 (AECOM, 2024b)
- Wet Season Sampling Event Factual Report, 2024, PFAS OMP – Robertson Barracks, 3 July 2024 (AECOM, 2024c)

In addition to the above reports, the following previous reports (and associated data) were also assessed as part of this OMR:

- Ongoing Monitoring Report, PFAS OMP – Robertson Barracks (November 2021 – March 2023), 16 January 2024 (AECOM, 2024a)
- Interpretive Report 2020, PFAS OMP – Robertson Barracks, 28 January 2021 (AECOM, 2021)
- Sampling Analysis and Quality Plan, PFAS OMP – Robertson Barracks, 25 September 2022 (AECOM, 2022)
- Detailed Site Investigation, Robertson Barracks, 31 May 2018 (Senversa, 2018a)
- Robertson Barracks, PFAS Management Area Plan, November 2018 (Defence, 2018)
- Robertson Barracks, PFAS Ongoing Monitoring Plan, 15 February 2023 (Defence, 2023)

2. MANAGEMENT AREA SETTING

2.1 MANAGEMENT AREA

The location of the base and the Management Area is shown in Figure 1, Appendix A. The Management Area comprises the following three areas:

- The base where AFFF containing PFAS was historically used or stored.
- The drainage channel running along the southern boundary of the Barracks, which discharges to Milners Creek to the east of the base.
- A portion of the western part of the Close Training Area (CTA).

Outside the Management Area, the monitoring previously included two groundwater bores used for drinking water supply at SBRS. These two bores were tested as part of the DSI (Senversa, 2018a), and were included as part of ongoing monitoring despite no previous detections of PFAS.

2.2 ENVIRONMENTAL SETTING

The Management Area identification and setting are summarised in Table 2-1 below. The Management Area is shown in Figure 1, Appendix A.

Table 2-1. Management Area Setting

Element	Description
Base Name	Robertson Barracks
Base ID	1200
Address	The Management Area includes the following addresses: • Robertson Barracks – Robertson Rd, Thorngate Road, Holtze NT 0829 • Part of the western section of the Close Training Area (CTA) – Thorngate Road, Holtze NT 0829 • Southern drainage channel located immediately south of Robertson Barracks
Monitoring Area	The Management Area covers 723.4 hectares (ha) (7.23 square kilometres [km^2]).
Land Parcels	Robertson Barracks (including the Marksmanship Training Range [MTR]): Tenure 805/990 CTA: Tenure 820/13
Municipality	Litchfield Municipality
Current Land Use Zoning	Commonwealth Land
Location	The Management Area is located approximately 17 km east of Darwin city centre. The area surrounding the Management Area contains predominantly semi-rural residential land uses, with open wetland and swamp areas as well as multiple quarrying areas including within the CTA.
Regional Meteorology	The Management Area lies within the monsoonal tropic area of northern Australia. Darwin has a typically tropical climate, with distinct, monsoonal wet (October to April) and dry (May to September) seasons. Most of the rainfall occurs from November to April, although isolated rainfall events also occur at the beginning and end of the dry season. Evaporation is relatively constant, with peaks during the wet season build-up. Maximum temperatures also occur during the wet season build-up, and minimum temperatures are reached in July. Mean annual rainfall, measured between 1941 and 2024, is 1,727 millimetres (measured at Darwin Airport Bureau of Meteorology [BOM] Station 014015 located approximately 5.5 km south-west of the base) (www.bom.gov.au, accessed 26 August 2024).
Topography	The Management Area is slightly undulating and low lying, with wetlands and swamps. It slopes toward the east, with the elevation ranging from approximately 37 metres Australian Height Datum (m AHD) in the northwest to 19 m AHD in the northeast. The surrounding area slopes to the northeast toward Shoal Bay.
Geology	The Management Area is generally underlain by the Bathurst Island Formation, which overlies the Wildman Siltstone Formation, except for an outcrop of the Acacia Gap Quartzite Member located within the CTA. The nature of each of these formations is summarised below: • Bathurst Island Formation typically comprises radiolarian claystone, sandy claystone, clayey sandstone, quartz sandstone, glauconitic sandstone and basal conglomerate up to 50 m in thickness. • Wildman Siltstone Formation comprises siltstone, silty sandstone and minor quartzite encountered between 50 m to over 1,000 m below ground level (m bgl). • Acacia Gap Quartzite Member comprises quartzite, commonly pyritic sandstone with interbedded siltstone.

Element	Description
Hydrogeology	The upper aquifer of the Tertiary colluvial and alluvial deposits and the Bathurst Island Formation are unconfined. Groundwater levels in the aquifer have been recorded at ground surface during the wet season and approximately 10 m bgl during the dry season. During the wet season, groundwater discharges to Milners Creek and some of the drains on the base when levels rise to near the site surface. However, as groundwater drops during the dry season, the drains and parts of Milners Creek stop flowing. Groundwater flow directions at the base generally follow topography and flows to the east or northeast. The groundwater seepage rate for the upper portion of the Bathurst Island Formation aquifer is between 46 m/year (dry season) to 77 m/year (wet season). The lower portion of Bathurst Formation aquifer has a seepage rate of approximately 2 m/year.
Surface Water Drainage	Robertson Barracks is in the Kings Creek Catchment, which flows north out into Shoal Bay, located northeast of Darwin Harbour. Robertson Barracks is situated partly on a wetland area, which extends to the west of the Barracks and drains south along the western boundary into the southern drainage channel, which discharges into the southern tributary of Milners Creek located in the CTA to the east of the base. There are several lined and unlined drainage channels located within the base that generally follow the local topography. Stormwater on the base discharges to open channels before discharging along points on the eastern, western and southern boundaries to the broader surface water system. The drainage lines in the south and southwest of Robertson Barracks discharge to the unlined southern drainage channel, which joins the headwaters of Milners Creek. The drainage lines in the central portion of Robertson Barracks discharge to a drain that runs underneath Thorngate Road to the east and into the western tributary of Milners Creek (in the CTA). The two tributaries of the Milners Creek system converge within the CTA, with the creek then flowing to the northeast and to the area known as Milners Swamp. These two tributaries of Milners Creek flow only at certain times of the year depending on rainfall. Milners Swamp drains into Kings Creek, which flows through Noogoo Swamp before entering Shoal Bay. Various artificial lakes are scattered across the CTA from historical quarrying activities. The lakes in the CTA are not connected to the surface water discharge system from the base or connected to Milners Creek.
Vegetation	The base and surrounds include both developed and undeveloped land areas that include fields, streams, wetlands, and forested areas.
Current Land Use	Robertson Barracks is the home of Australia's 1st Brigade, whose mission is to provide forces to conduct operations to defend Australia and its national interests. 1st Brigade is a Combat Brigade with the purpose of contributing to provide enabled land forces. The following units and regiments are located at Robertson Barracks: • 1st Aviation Regiment • 1st Combat Service Support Battalion • 8th/12th Medium Regiment • 1st Command Signals Regiment • 5th Battalion (Motorised) Royal Australian Regiment • 17 Combat Service Support Force Elements • Matilda Lines – Marine Rotational Force – Darwin • 1st Combat Engineer Regiment • Joint Logistic Unit – North • 1st Brigade Headquarters In addition to the above, Robertson Barracks contains training areas (including live training areas at the MTR and CTA), accommodation and recreational facilities. The surrounding land use is predominantly Commonwealth owned, with no privately-owned rural residential homes within a 1 km radius of the base. Identified land uses in each direction from the base are summarised below.

Element	Description
	• **North:** The SBRS is located to the north of Robertson Barracks. This area predominantly comprises open woodlands, wetlands and swamps overlying an undulating topography. The littoral and marine zones of Shoal Bay lie immediately north of the SBRS. • **East:** Former sand and gravel quarries lie immediately to the north and northeast. CTA (Commonwealth owned and managed by Defence) lies directly east of Robertson Barracks and is used for live fire training by Defence. Further east is the Darwin Correctional Facility. • **South:** Small woodland open reserve area, light industrial, commercial retail, office facilities and the Stuart Highway. • **West:** Open woodlands, tall shrubland, plains and swamps as well as an area managed by Airservices Australia (not related to fire training exercises). Further west are semi-rural residential dwellings and Knuckey Lagoons Conservation Reserve. Thorak Regional Cemetery is located approximately 900 m northwest of Robertson Barracks.

2.3 SOURCE AREAS

The PMAP (Defence, 2018) identified the following locations as key PFAS source areas, shown in Figure 1, Appendix A:

- **Source Area 1**: The Emergency Response Squadron (ERS) were formerly located within Building 137 at this source area in the northeast of Robertson Barracks. The ERS stored concentrated AFFF, as well as undertook maintenance, testing and refilling of fire-fighting equipment. The ERS later moved to the southwest of the base.
- **Source Area 2:** This was the location of the former 2 Cavalry Regiment. Anecdotal information indicated that the ERS parked their vehicles in this area prior to their move to Building 137 (Source Area 1).
- **Source Area 3:** Underground storage tank (UST) refuelling area and wash down bays, which may have been utilised for firefighting tankers for wash down or testing purposes using PFAS containing foams.

2.4 REMEDIATION PROJECTS

No remediation projects were undertaken at the base during the reporting period. This is consistent with the base PMAP (Defence, 2018), which outlines that active remediation—such as treatment or removal of PFAS-impacted soil or groundwater—is not required under current site conditions.

The PMAP determined that the identified PFAS impacts do not pose an unacceptable risk to human health or the environment based on existing land use and exposure scenarios. As such, the preferred management approach is to undertake periodic sampling to monitor trends and the extent of PFAS, alongside administrative and exposure control measures already in place.

Remediation would only be considered if future monitoring indicates a change in PFAS behaviour, distribution, or risk profile that would warrant a revised management response. The current strategy remains focused on collecting data to support assessment of risks and to inform future decisions, in line with the PMAP's adaptive management framework.

2.5 INFRASTRUCTURE PROJECTS

Development works at the base have included several infrastructure projects over the reporting period that may have resulted in the disturbance and stockpiling of soil, including (but not limited to):

- EST07444 Robertson Barracks Redevelopment project
- EST09535/EST09536 L121 Upgrades

- EST08306 Military Working Dogs Upgrades
- Other minor trenching and stockpiling works across the base

Each project is responsible for how they manage any potential PFAS-impacted soil and/or groundwater under their approved Environmental Clearance Certificates. However, due to the movement of soil as part of these projects, there is a potential for some mobilisation of PFAS. PFAS-impacted materials encountered or handled by these projects are managed through implementation of Defence's PFAS Construction and Maintenance Framework (Department of Defence, 2025).

Tetra Tech Coffey is not aware of any other practices or recent incidents which are likely to have resulted in changes to the nature or extent of PFAS at the base.

3. SAMPLING AND ANALYTICAL SCOPE AND METHODOLOGY

AECOM prepared a sampling analysis and quality plan (SAQP) (AECOM, 2022) that included details for how the sampling required by the OMP is to be undertaken. The SAQP (included in Appendix B) provides the details of the sampling locations and media, sampling schedule, justification of sampling approaches, sampling methodologies, analytical schedule and the approach to ensuring quality assurance and quality control (QA/QC) requirements were achieved.

3.1 SUMMARY OF COMPLETED MONITORING OCTOBER 2023–MARCH 2024

Table 3-1 below provides a summary of the monitoring works completed by AECOM as part of the SAQP (AECOM, 2022) between October 2023 and March 2024. The groundwater and surface water sampling locations are shown in Figure 2 and Figure 3, Appendix A, respectively.

Table 3-1. Summary of Monitoring Works

Monitoring Event	Sampling Matrix	Sampling Date	Number of Samples Required in SAQP	Number of Samples Collected
End of dry season 2023	Groundwater	5–9 October 2023	18	17
Start of wet season 2024	Surface water	28 November 2023 and 11–15 December 2023	9	9
End of wet season 2024	Groundwater	1–12 March 2024	18	18
	Surface water	1–8 March 2024	9	9

3.2 DEVIATIONS FROM THE SAQP

The SAQP detailed sediment sampling locations and methodologies (AECOM, 2022). The requirement for sediment sampling was removed from the updated OMP (Defence, 2023), and therefore, sediment was not sampled during this reporting period. This update reflects the findings of previous monitoring rounds and the current conceptual site model, which identified that PFAS risks to ecological receptors from sediment are low and acceptable. Ongoing monitoring efforts were refocused on media where changes in concentrations are more likely to indicate a change in the potential risks to receptors, namely groundwater and surface water.

Additional deviations from the scope outlined in the SAQP, which were outlined in the associated sampling event factual reports, are summarised in Table 3-2 below.

Table 3-2. Summary of Sampling Analysis and Quality Plan Deviations

SAQP Requirement	Deviation	Impact of Deviation on Data Set
Dry Season 2023		
Sampling of all OMP groundwater locations	Monitoring location MW004 was not sampled due to root growth preventing deployment of HydraSleeve™.	***Minor impact*** - The lack of data from MW004 has a minor impact on the understanding of concentration changes within the source area. This location has previously been able to be sampled during the wet season when roots are inundated.
	Monitoring location MW023 was dry and not able to be sampled. Monitoring location MW024 was sampled in-lieu of MW023.	***No impact*** - The alternative well, MW024, was considered suitable due to its location (approximately 405 m down hydraulic gradient of MW023) and screen interval (2.0 to 8.0 m bgl as is MW023) to provide coverage for the assessment of PFAS impacts in the area. The overall dataset is not considered to have been impacted by this change.
Water quality parameter collection for groundwater.	The water quality parameter data at location MW030 was lost due to electronic data collection fault, where the data was not saved and could not be retrieved.	***Minor impact*** - The lack of water quality parameter data is considered to have only a minor impact on the understanding of groundwater conditions in this location.
Wet Season 2024		
Collection of field parameters and observations at each sample location.	The water quality monitor utilised on 1 March 2024 during the end of wet season surface water sampling event malfunctioned during fieldworks, and dissolved oxygen (DO) readings were not taken at SW086, SW091, SW123, MW018, MW021, MW021D and MW023.	***Minor impact*** - The DO readings collected on this day (prior to the malfunction) were removed from the dataset as a precaution. The lack of this data has a minor impact on the understanding of groundwater conditions in this location.
	Electrical conductivity readings for the groundwater samples were not accurate due to faulty equipment.	***Minor impact*** - Historical end of wet season field parameters is considered reliable. The lack of this data has a minor impact on the understanding of groundwater conditions in this location.
Collection of gauging data within the 24-hour methodology period	MW001 was not gauged within the 24-hour gauging period with the other wells.	***Minor impact*** - Nearby well (MW030) recorded approximately a 100 mm difference between the gauging and sampling event, which was considered to have a minor impact upon interpreting groundwater contours displayed in the respective report.
No end of wet season analysis completed for SW001 and SW075	Locations were visited and sampled; however, the laboratory did not analyse the samples and disposed of them prior to analysis.	***Minor impact*** – Late wet season surface water PFAS data was lost for these locations. However, results both upgradient and downgradient of these locations have shown non-detects for the March 2024 sampling round. The lack of this data has a minor impact on the understanding of surface water conditions in this location.

4. QUALITY ASSURANCE AND QUALITY CONTROL

AECOM implemented a QA/QC program as part of their field sampling procedures compliant with guidance provided in relevant Australian Standards, Heads of Environment Protection Authority (HEPA) 2020 PFAS National Environmental Management Plan Version 2.0 (HEPA, 2020), (herein referred to as the PFAS NEMP 2.0) and industry practice. The implemented QA/QC program included the following:

- The use of appropriately qualified/trained environmental scientists to conduct the assessment.
- The use of standardised field records to document the findings of the assessment.
- Appropriate preservation of samples during transport from the field to the laboratory.
- The use of chain-of-custody documentation to ensure the traceability of sample transport and handling.
- The use of laboratories accredited by the National Association of Testing Authorities Australia (NATA) for the analysis of samples.
- The collection and analysis of field QC samples.
- Review of internal analysis of laboratory QC samples.
- The use of appropriate laboratory reporting limits.
- Compliance with sample holding times.
- Comparison of field and analytical data to check for the occurrence of apparently unusual or anomalous results.

A review of the QA/QC sampling measures implemented as a part of the sampling program has been undertaken to evaluate the precision and accuracy of the results and to assess whether the results can be relied on in drawing conclusions about the nature and extent of PFAS impacts in the Management Area.

AECOM undertook a review to validate the QA/QC results for each sampling event included within the following factual reports provided in Appendix B, namely:

- AECOM, PFAS OMP Robertson Barracks, Sampling Event Factual Report, Dry Season 2023 (AECOM, 2024b)
- AECOM, PFAS OMP - Robertson Barracks, Wet Season Sampling Event Factual Report, 2024 (AECOM, 2024c)

Tetra Tech Coffey has undertaken a review of the QA/QC results by AECOM as detailed below.

The steps in the sampling and analysis process are subject to natural and inherent variability, and this can affect the results produced and the overall quality of the data sets generated. To minimise the effect of this, standard procedures are used for works carried out in the field and in the laboratory. The use of such procedures represents one aspect of the quality assurance process. To measure the effectiveness of the QA process, QC samples can be tested, and other QC tests can be conducted during the analysis of samples taken in the field.

4.1 QUALITY ASSURANCE

Tetra Tech Coffey reviewed the QA measures deployed by AECOM during the sampling events in this reporting period. A summary of the QA measures, and outcomes of the review, are provided in Table 4-1 below.

Table 4-1. QA Measures Reviewed

Item	Detail	Yes	No	Comment
Sampling Methodologies	Samples to be collected, and decontamination/avoidance of cross-contamination measures to be employed in accordance with approved SAQP (AECOM, 2022).	☐	☒	Minor deviations to SAQP occurred; however, these are not considered to have affected the integrity of the data collected. Further details on deviations are provided in Section 3.2.
Sample Handling	All samples to be given a unique identifier and labelled with relevant project details. All samples were placed in chilled, insulated coolers.	☒	☐	Some samples received at the laboratories exceeded the recommended temperature range of ≤ 6°C (up to 30.5°C). As key PFAS compounds analysed are not volatile, the samples were received at the ambient water temperatures (~30°C) and samples were cooled immediately upon collection, this is not considered to affect the interpretation of results.
Frequency of QC Samples	QC samples collected at a rate of one (1) QC sample for 10 primary samples in accordance with PFAS NEMP.	☒	☐	
Rinsate Samples	Rinsate samples to be prepared in the field using empty bottles and PFAS-free de-ionised water used for cleaning of non-disposable sampling equipment. Rinsate samples to be collected at a minimum rate of 1 sample per day per piece of reusable sampling equipment.	☒	☐	

4.2 QUALITY CONTROL

Quality control samples and tests can be used to assess both the accuracy and the precision of the results produced.

Measures of accuracy provide information on how close the reported result is to the true result. For practical reasons, measures of accuracy are usually provided by the laboratory in the overall process.

Measures of precision provide information on the variability in the results. Precision can be assessed as:

- “Repeatability” or intra-laboratory variation – the degree of variation in a result when the same laboratory analyses a sample (or blind replicate) several times, and
- “Reproducibility” or inter-laboratory variation – the degree of variation in a result when a different laboratory separately analyses a sample.

In addition, blank samples can be used to assess whether extraneous materials and factors have contributed to the results obtained from the sampling and analysis process.

4.2.1 Field Quality Control

Precision of the sample collection, transport and analysis process is measured by the relative percent difference (RPD) between duplicate results. Acceptance targets for duplicates are dependent on matrix type, contaminant type and contaminant concentrations. RPDs less than 30 percent are considered acceptable, unless:

- Results are less than 10 times the limit of reporting (LOR) – in which instance there is no limit, or
- Results less than 20 times the LOR have an RPD of less than 50 percent.

Results in this reporting period had RPDs within the acceptable control limits, except for MW034 in the Wet Season Factual Report, 2024 (AECOM, 2024c), where an RPD of 33 percent (interlaboratory duplicate) was calculated for perfluorooctane sulfonic acid (PFOS). As all other results were within the acceptable limit, this elevated RPD is not considered to adversely affect the interpretation of results.

A review of the results of the QC replicate sampling indicated a good correlation between the intra-laboratory duplicate results (samples analysed at the primary laboratory) and interlaboratory duplicate results (samples analysed at the secondary laboratory).

Rinsate blanks, trip blanks and field blanks were collected as a part of the AECOM sampling program and analysed for PFAS. All results were below the laboratory reporting limits, indicating that the potential for cross-contamination between sampling locations, during sampling or during sample transport was low and acceptable.

The results from the QC sampling indicate that the dataset may be relied on to assess risks to receptors and changes in concentrations as a part of this report.

4.2.2 Laboratory Quality Control

Laboratories are accredited by the NATA based on their ability to provide quantitative evidence of their ability and competence to produce reliable results against recognised benchmarks. NATA-accredited laboratories can demonstrate the ability to produce reliable, repeatable results for a range of parameters within a range of sample matrices. Each laboratory method undergoes a validation process before it is adopted by the laboratory and accredited by NATA. As part of the validation process, the precision and accuracy of the method are established.

In addition, laboratories conduct their own QC testing to indicate their performance on each reported batch of samples. The results of this testing are compared with the validated precision and accuracy.

No non-conformances were reported.

4.3 SUMMARY

The QA/QC review process undertaken for this OMR included:

- Data integrity check – verifying the data are complete, accurate and consistent with established standards and procedures.
- Methodology review – ensuring the correct sampling and analytical methods were used.
- Validation of results – comparing the results with QA/QC criteria (such as RPDs and laboratory control limits) to confirm the data are within acceptable ranges.
- Identification of anomalies – checking for any errors or inconsistencies in the data and investigating causes.
- Documentation – ensuring all QA/QC procedures and findings are documented.

Following the review, Tetra Tech Coffey considers the data obtained during this reporting period, along with the historical data assessed, to be reliable, i.e., representative of actual PFAS concentrations and site conditions at the time of monitoring, and therefore, suitable for understanding risk within the Management Area.

5. ASSESSMENT CRITERIA

Adopted screening criteria references national guidance from the PFAS NEMP, Defence estate and environmental strategies, and Defence PFAS-specific strategies and guidance. PFAS screening values are derived from the following documents:

- HEPA *PFAS National Environmental Management Plan Version 3.0,* 2025 (HEPA, 2025)[2].
- Department of Health (DoH). *Health based Guidance Values for PFAS for use in Site Investigations in Australia.* April 2017 (Department of Health, 2017).
- National Health and Medical Research Council (NHMRC), 2019. Guidance on PFAS in Recreational Water. August 2019 (NHMRC, 2019).
- National Environment Protection (Assessment of Site Contamination) Measure 1999 (ASC NEPM), Schedule B1, as amended in 2013 (NEPC, 2013).

Adopted PFAS screening values for groundwater and surface water are provided in Table 5-1 below.

Table 5-1. PFAS Screening Criteria

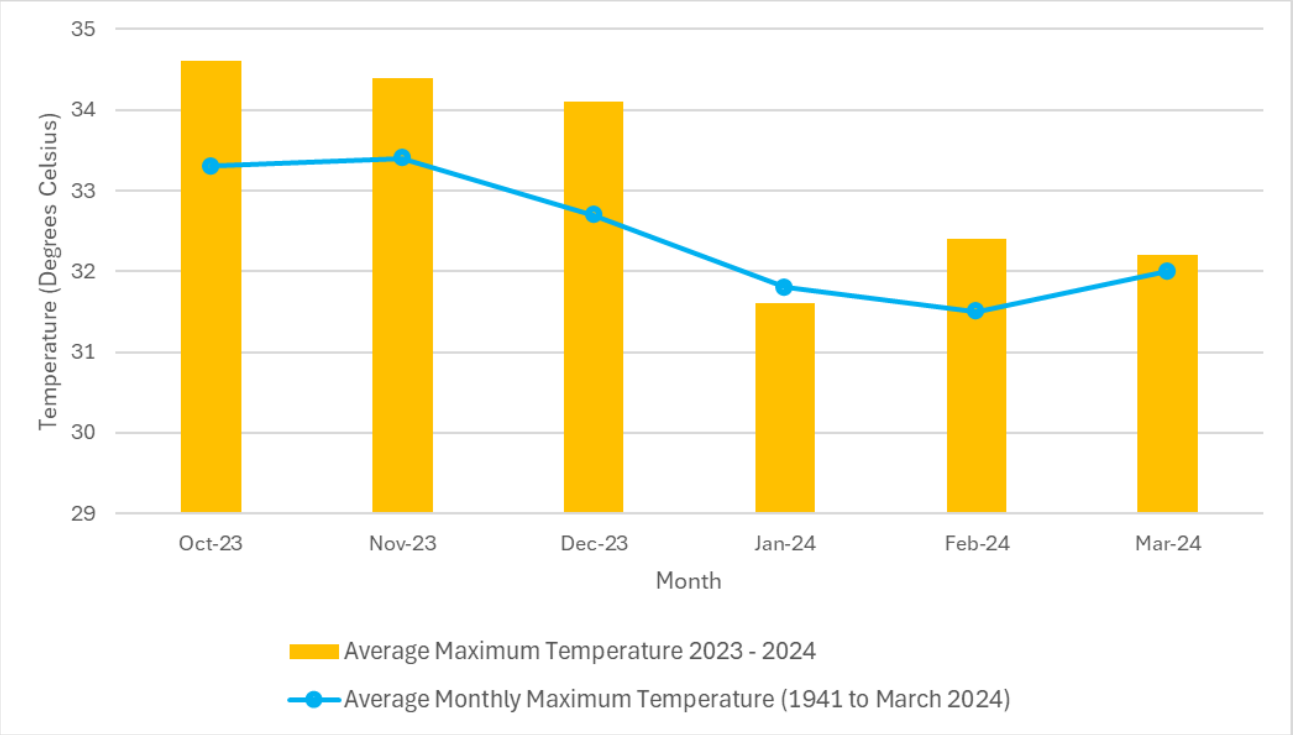
Media	Pathway	Compound	Criteria	Comment / Reference
Groundwater and Surface Water	Freshwater	PFOS	0.00023 µg/L	PFAS NEMP 99% species protection.
		PFOA	19 µg/L	
Groundwater	Drinking water	Sum of PFHxS+ PFOS[1]	0.07 µg/L	The values presented in the PFAS NEMP are from Department of Health (DoH) 2017. DoH utilised the tolerable daily intake for PFOS and PFOA from Food Standards Australia New Zealand (FSANZ; 2017) and the methodology described in Chapter 6.3.3 of National Health and Medical Research Council (NHMRC) Australian Drinking Water Guidelines, 2016, to determine drinking water values.
		PFOA	0.56 µg/L	
Surface Water	Recreational use	Sum of PFHxS+ PFOS[1]	2 µg/L	The values presented in the PFAS NEMP were based on NHMRC guidance on the assessment of PFAS in surface water. The NHMRC adjusted the ingestion rate with consideration to an event frequency (150 events per year) to calculate an annual ingestion rate of 30 L per year.
		PFOA	10 µg/L	

Notes:
1. HEPA (2025) notes where the criteria refer to the sum of PFOS+PFHxS; this includes PFOS only, PFHxS only, and the sum of the two.

[2] Sampling and sample analysis were conducted in accordance with PFAS NEMP 2.0, as NEMP 3.0 had not yet been published at that time (October 2023 and March 2024). However, the interpretation of the results was conducted in accordance with NEMP 3.0, which was published in March 2025.

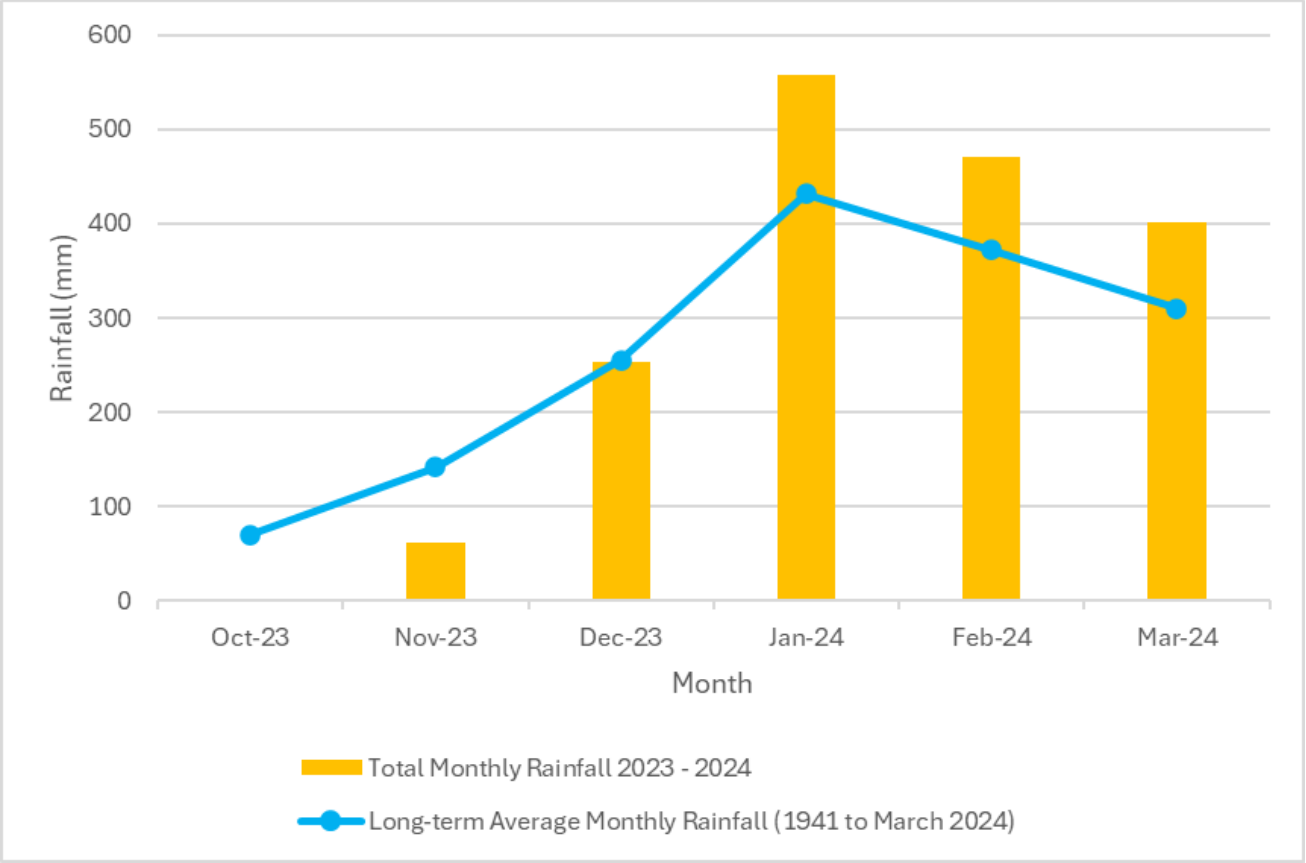
6. CLIMATE

The monitoring period between October 2023 and March 2024 was characterised by above average temperatures in all months except January 2024, where the average temperature was slightly (0.2°C) below the long-term average. A graph of monthly reported temperatures alongside the long-term average is shown in Graph 6-1.



Graph 6-1. Average monthly maximum temperatures (October 2023–March 2024) vs long-term average monthly temperature (Darwin Airport, station ID 041015) (BOM, 2024).

Monthly rainfall values during the months of October and November 2023 were below the long-term average, with rainfall increasing to match the average in December, followed by higher-than-average rainfall in the early months of 2024 (January through March). A graph of monthly reported rainfall alongside the long-term average is shown in Graph 6-2.



Graph 6-2. Total monthly rainfall vs long-term averages (Darwin Airport, station ID 041015) (BOM, 2024).

Surface water sampling (on-base and off-base) occurred twice in the wet season. The first event of this reporting period occurred in November 2023 and December 2023 as soon as practicable after the start of the higher rainfall period, as the end of the dry season/start of the wet season is normally characterised by spikes in surface water concentrations (i.e., “first-flush” sampling). Given the below average rainfall in October and November 2023, the sampling in November 2023 and December 2023 is considered to have functioned as the first-flush event for this wet season. The second sampling event occurred at the end of the wet season in March 2024, as it did in 2023.

7. MONITORING DATA SUMMARY

A summary of the monitoring completed in the reporting period is provided in Table 3-1, Section 3.1. The groundwater and surface water sampling locations are shown in Figure 2 and Figure 3, Appendix A, respectively. A detailed analysis of these results is provided in Section 8.

The monitoring events completed during the reporting period have been reported in the following factual reports:

- AECOM, PFAS OMP Robertson Barracks, Sampling Event Factual Report, Dry Season 2023 (AECOM, 2024b), including the:
  - October 2023 groundwater monitoring event.
- AECOM, PFAS OMP Robertson Barracks, Wet Season Sampling Event Factual Report, 2024 (AECOM, 2024c), including the:
  - November and December 2023 surface water monitoring event;
  - March 2024 groundwater monitoring event; and the
  - March 2024 surface water monitoring event.

7.1 GROUNDWATER RESULTS

7.1.1 Monitoring Well Network Condition

The monitoring well network was observed to be in good condition, with the following exception:

- MW004 was blocked during the dry season (2023) sampling event and could not be sampled. The blocking was likely caused by tree roots deeper in the well. MW004 was sampled during the following wet season (March 2024) when water levels were higher and above the blockage. The well was redeveloped by a drilling contractor on 11 November 2024 via airlifting techniques to remove any sediment and any sediment and debris. Roots were encountered at 8.10 m bTOC and, following removal, the total depth of the well was confirmed to be 8.46 m bTOC. The well is now accessible for future monitoring events.

7.1.2 Groundwater Field Observations

The field observations recorded during the groundwater monitoring events (GMEs) (October 2023 and March 2024), including groundwater elevation and water quality parameters, are provided in Table C1, Appendix C, and summarised in Table 7-1 below.

Table 7-1. Groundwater Field Observations Summary

	Dry Season 2023	Wet Season 2024
Factual Report	AECOM, 2024b	AECOM, 2024c
Sample Dates	5 – 9 October 2023	1 – 12 March 2024
Colour	Groundwater at MW066, MW112 and MW113 was observed to be colourless. Groundwater at MW024 was observed to be brown. Groundwater at all other monitoring wells was observed to be light or pale brown.	Groundwater at MW004, MW004D, MW012, MW021D, MW032, MW112 and MW113 was observed to be colourless. Groundwater at MW001, MW012D, MW021, MW031 and MW080 was observed to be light or pale brown. Groundwater at MW018, MW023, MW029 and MW030 was observed to be brown. Groundwater at MW034 was observed to be white. Groundwater at MW066 was observed to be grey.
Turbidity	Moderate turbidity was observed at locations MW012, MW024, MW029, MW031, MW032, MW034. Low turbidity was observed at all other locations.	Moderate turbidity was observed at MW001, MW018, MW029 and MW030. Low turbidity was observed at all other locations.
Odour	All samples were noted to be odourless.	An organic odour was noted in MW034. All other samples were noted as odourless.
Other Observations	No sheen was observed at any location. Suspected root impaction was observed at MW004. MW023 was dry; contingency well MW024 was sampled in lieu of MW023. Field observations were not recorded for MW030 due to an equipment error.	An organic sheen was observed in MW031. No other sheens were noted.

7.1.3 Groundwater Elevation

The standing water level (SWL) was gauged in all wells prior to sampling, measured in metres below top of casing (m BTOC) and converted to groundwater elevations in metres Australian Height Datum (m AHD). The groundwater gauging results are presented in Table C1, Appendix C, and summarised in Table 7-2 below.

Table 7-2. Summary of Groundwater Elevations

Sampling Event	Number of Wells	Minimum Groundwater Level		Maximum Groundwater Level	
		m bTOC	m AHD	m bTOC	m AHD
Dry season (October 2023)	15	2.322 (MW024)	1.56 (MW024)	8.541 (MW021D)	21.89 (MW029)
Wet season (March 2024)	16	0.746 (MW030)	16.08 (MW021D)	4.612 (MW12D)	23.76 (MW029)

7.1.4 Groundwater Flow Directions

The groundwater elevation data are tabulated in Table C1, Appendix C. Inferred groundwater contours and flow directions from the October 2023 and March 2024 GMEs are presented in Figure 4A and Figure 4B, Appendix A, respectively.

Groundwater elevation is observed to be the highest in the western portion of the base, with groundwater flowing in a north-easterly direction toward the CTA from the northern portion of the base. Groundwater in the southern end of the base is observed to flow east toward the catchment of Milners Creek. This is consistent with previous investigations.

7.1.5 Groundwater Quality Field Measurements

Groundwater quality field measurements recorded during sampling are tabulated in Table C1, Appendix C. A summary of the maximum and minimum field parameters for the reporting period, along with historical maximum and minimums, is presented in Table 7-3 below.

Table 7-3. Groundwater Quality Parameter Ranges

	Historical (April 2019 to March 2023)	Dry Season (October 2023)	Wet Season (March 2024)
Number of Samples	143	16[1]	18
Dissolved Oxygen (mg/L)	0.00 (MW029) – 36.40[3] (MW113) *Poor to well oxygenated conditions*	1.32 (MW0018) – 6.37 (MW113) *Well oxygenated conditions*	0.72 (MW0031) – 5.22 (MW112)[2] *Poor to well oxygenated conditions*
Electrical Conductivity (µS/cm)	29.1 (MW032) – 1,902.0 (MW024) *Freshwater conditions*	24.8 (MW012) – 15,838.2 (MW024) *Freshwater to saline conditions*	0.6 (MW112) – 392.3 (MW113) *Freshwater conditions*
pH	3.70 (MW031) – 7.81 (MW021) *Acidic to neutral conditions*	3.65 – (MW066) 6.70 (MW112) *Acidic to neutral conditions*	4.90 – (MW030) 7.00 (MW018 and MW113) *Acidic to neutral conditions*
Corrected Redox (mV)	44.6 (MW004) – 655.8 (MW066) *Slightly oxidising to oxidising conditions*	104.2 (MW004D) – 466.0 (MW021) *Oxidising conditions*	204.3 (MW004D) – 465.7 (MW112) *Oxidising conditions*
Temperature (°C)	24.8 (MW113) – 33.7 (MW034)	28.7 (MW112) – 31.8 (MW012D)	27.1 (MW001) – 36.8 (MW113)

Notes:
1. One sample (MW030) did not have field parameters recorded due to an equipment malfunction.
2. Dissolved oxygen was not recorded for some samples due to equipment malfunction.
3. This value is noted as a likely field reporting or equipment error.

7.1.6 Groundwater PFAS Analytical Results

The groundwater analytical results, including historical results, are presented in Table C2, Appendix C. Groundwater sampling locations are shown in Figure 2, Appendix A.

A summary of PFOS, sum of PFOS+PFHxS, and PFOA concentrations in this reporting period, and deviations from the historical groundwater dataset, are provided in Table 7-4 and Table 7-5 below. Groundwater concentration ranges reported in this monitoring period for sum of PFOS+PFHxS and PFOA are presented in Figure 5A and Figure 5B (Appendix A), respectively.

Deviations from the historical groundwater dataset are summarised in Table 7-5.

Table 7-4. Summary of PFOS, Sum of PFOS+PFHxS and PFOA Concentrations in Groundwater

Sampling Event	Number of Samples[1]	Analyte	Concentration Range (µg/L) (Sample ID)[4]	Number of samples above LOR[1]	Number of samples above Human Health Criteria[1]	Number of samples above Ecological Criteria[1,2]
End of Dry Season (October 2023)	24	PFOS	<0.01 (Multiple) – 0.36 (1200_MW066_231009)	14	*n/a*[3]	14
		Sum of PFOS+PFHxS	<0.01 (Multiple) – 0.45 (1200_MW066_231009)	14	6	*n/a*[3]
		PFOA	<0.01 (Multiple) – 0.02 (1200_MW066_231009)	1	0	0
Wet Season (March 2024)	18	PFOS	<0.01 (Multiple) – 0.16 (1200_MW066_240307)	8	*n/a*[3]	8
		Sum of PFOS+PFHxS	<0.01 (Multiple) – 0.34 (1200_MW066_240307)	8	5	*n/a*[3]
		PFOA	<0.01 (Multiple) – 0.02 (1200_MW066_240307)	1	0	0

Notes:

1. All samples (primary and duplicates)
2. As ecological criteria are below laboratory limit of reporting (LOR), only samples above the LOR have been included.
3. *n/a* indicates that there are no criteria for the relevant analyte.
4. Sample ID naming convention: 1200_Location ID(MW#)_Date(YYMMDD)

Table 7-5. Deviations from Historical Groundwater Dataset

Deviation	PFOS			Sum of PFOS+PFHxS			PFOA		
First Time Detections	*None*[3]			*None*[3]			1200_MW021_231006 (0.02 µg/L)		
New Exceedances of Ecological Criteria[2]	*None*[3]			*n/a*[4]			*None*[3]		
New Exceedances of Human Health Criteria[1]	*n/a*[4]			*None*[3]			*None*[3]		
New Minimums	*None*[3]			*None*[3]			*None*[3]		
New Maximums	**Sample**	**New max.**	**Previous max.**	**Sample**	**New max.**	**Previous max.**	**Sample**	**New max.**	**Previous max.**
	QC100[5] (28/11/2023)	0.03 µg/L	<0.01 µg/L	QC100[5] (28/11/2023)	0.03 µg/L	<0.01 µg/L	-	-	-

Notes:

1. Human health criteria for groundwater denotes drinking water guidelines (PFAS NEMP 3.0 (HEPA, 2025))
2. As ecological criteria are below laboratory LOR, only samples above the LOR have been included.
3. *None* indicates that no new deviations were detected in this monitoring period.
4. *n/a* indicates that there are no criteria for the relevant analyte.
5. Duplicate of MW004D. The primary sample and triplicate sample also reported first time detects of between 0.01 and 0.026 µg/L.

7.2 SURFACE WATER RESULTS

7.2.1 Surface Water Field Observations

The field observations recorded during the surface water sampling events (November 2023, December 2023 and March 2024) are provided in Table C3, Appendix C, and summarised in Table 7-6 below.

Table 7-6. Surface Water Field Observations Summary

	Beginning of Wet Season 2023	End of Wet Season 2024
Factual report	(AECOM, 2024c)	(AECOM, 2024c)
Sample dates	28 November and 11 – 15 December 2023	1 – 8 March 2024
Flow	Locations SW001, SW007, SW023, SW028 and SW075 were observed as have a low level of flow. Locations SW091 and SW123 were observed as having a moderate level of flow. Locations SW059 and SW086 were observed as pooled.	Locations SW001, SW007, SW023, SW028, SW059, SW075 and SW086 were observed as have a low level of flow. Locations SW091 and SW123 were observed as having a moderate level of flow.
Colour	Samples from locations SW007, SW023, SW028, SWSW059, SW075, SW091 and SW123 were all observed to be colourless. The sample from MW001 was observed to be pale brown, whilst the sample from MW086 was noted to be brown.	Samples from locations SW007, SW023, SW028, SWSW059, SW075 and SW123 were all observed to be colourless. Samples from locations SW001, and SW086 were observed to be pale brown. The sample from MW091 was observed to be pale yellow.
Turbidity	Moderate turbidity was observed in the sample collected at location SW091. Low turbidity was recorded at all other locations.	Moderate turbidity was observed in samples collected at locations SW001 and SW086. Low turbidity was recorded at all other locations.
Odour	An organic odour was recorded in the sample collected at SW091. All other samples were recorded as odourless.	All samples were recorded as odourless.
Other observations	An organic sheen was observed in the sample collected at SW091. No other sheens were observed.	No samples were observed to have a visible sheen.

7.2.2 Surface Water Quality Field Measurements

Surface water quality field measurements recorded during sampling are tabulated in Table C3, Appendix C. A summary of the maximum and minimum field parameters for the reporting period, along with historical maximum and minimums is presented in Table 7-7 below.

Table 7-7. Surface Water Quality Parameter Ranges

	Historical (April 2019 to March 2023)	Start of Wet Season 2023	End of Wet Season 2024
Number of Samples	64	9	9
Dissolved Oxygen (mg/L)	0.56 (SW123) – 73.40[1] (SW001) *Poor to well oxygenated conditions*	1.48 (SW086) – 5.35 (SW023) *Well oxygenated conditions*	2.54 (SW007) – 5.22 (SW023) *Well oxygenated conditions*
Electrical Conductivity (µS/cm)	5.6 (SW028) – 246.7 (SW001) *Freshwater conditions*	33.4 (SW028) – 80.0 (SW007) *Freshwater conditions*	14.4 (SW028) – 61.7 (SW086) *Freshwater conditions*
pH	5.01 (SW059) – 8.40 (SW091) *Acidic to slightly alkaline conditions*	5.0 (SW086) – 8.3 (SW023) *Acidic to slightly alkaline conditions*	5.5 (SW007) – 7.0 (SW023) *Acidic to neutral conditions*
Corrected Redox (mV)	238.4 (SW091) – 475.8 (SW023) *Oxidising conditions*	-4.4 (SW075) – 315.0 (SW086) *Slightly reducing to oxidising conditions*	224.2 (SW075) – 293.9 (SW091) *Oxidising conditions*
Temperature (°C)	24.4 (SW007) – 35.6 (SW007)	27.6 (SW028) – 31.8 (SW075)	27.6 (SW059) – 35.3 (SW028)

Notes:
1. This value is noted as a likely field reporting or equipment error.

7.2.3 Surface Water PFAS Analytical Results

The surface water analytical results, including historical results, are presented in Table C4, Appendix C . Groundwater sampling locations are shown in Figure 3, Appendix A.

A summary of PFOS, sum of PFOS+PFHxS and PFOA concentrations in this reporting period is provided in Table 7-8 and Table 7-9 below and presented in Figures 6A and 6B (Appendix A), respectively.

Deviations from the historical surface water dataset are summarised in Table 7-9.

Table 7-8. Summary of PFOS, Sum of PFOS+PFHxS and PFOA Concentrations in Surface Water

Sampling Event	Number of Samples[1]	Analyte	Concentration Range (> LOR) (µg/L) (Sample ID)[4]	Number of Samples above LOR[1]	Number of Samples above Human Health Criteria[1]	Number of Samples above Ecological Criteria[1,2]
Start of Wet Season 2024	13	PFOS	<0.01 (Multiple) – 0.11 (1200_SW123_231128)	7	*n/a*[3]	7
		Sum of PFOS+PFHxS	<0.01 (Multiple) – 0.18 (1200_SW123_231128)	6	0	*n/a*[3]
		PFOA	<0.01 (Multiple)	0	0	0
End of Wet Season 2024	7	PFOS	<0.01 (Multiple) – 0.14 (1200_SW059_240307)	3	*n/a*[3]	3
		Sum of PFOS+PFHxS	<0.01 (Multiple) – 0.19 (1200_SW059_240307)	3	0	*n/a*[3]
		PFOA	<0.01 (Multiple)	0	0	0

Notes:
1. All samples (primary and duplicates)
2. As ecological criteria are below laboratory LOR, only samples above the LOR have been included.
3. *n/a* indicates that there are no criteria for the relevant analyte.
4. Sample ID naming convention: 1200_Location ID(MW#)_Date(YYMMDD)

Table 7-9. Deviations from Historical Surface Water Data Set

Deviation	PFOS			Sum of PFOS+PFHxS (Sum)			PFOA
First Time Detections	1200_QC100_231215 (0.07 µg/L)[3]			1200_QC100_231215 (0.08 µg/L)[3]			*None*[4]
New Exceedances of Ecological Criteria[2]	1200_QC100_231215 (0.07 µg/L)[3]			n/a[5]			*None*[4]
New Exceedances of Human Health Criteria[1]	n/a[5]			*None*[4]			*None*[4]
New Minimums	*None*[4]			*None*[4]			*None*[4]
New Maximums	**Sample**	**New max.**	**Previous max.**	**Sample**	**New max.**	**Previous max.**	*None*[4]
	QC100 (SW007 duplicate) (15/12/2023)	0.07 µg/L	<0.01 µg/L	QC100 (SW007 duplicate) (15/12/2023)	0.08 µg/L	<0.01 µg/L	

Notes:

1. Human health criteria for groundwater denotes drinking water guidelines (PFAS NEMP 3.0 (HEPA, 2025))
2. As ecological criteria are below laboratory LOR, only samples above the LOR have been included.
3. Duplicate of 1200_SW007_231215 (<LOR)
4. *None* indicates that no deviations were detected during this monitoring period.
5. *n/a* indicates that there are no criteria for the relevant analyte.

8. INTERPRETIVE ANALYSIS

In addition to reporting period data, historical data from 2017 to 2023 were included in the assessment to analyse temporal trends. The historical data were obtained from the historical documents as outlined in Section 1.3 of this report.

Where sufficient data were available, Mann-Kendall statistical analysis has been used to assess trends at individual monitoring locations. Where a location appears to be seasonally influenced, and where there is sufficient dataset, the Mann-Kendall statistical analysis was undertaken for the separated wet season and dry season datasets (i.e., seasonal Kendall test).

For surface water, in addition to Mann-Kendall analysis (where there was sufficient data), temporal trend assessment of scatter plots presenting concentrations against daily rainfall averages was also carried out.

8.1 HYDROGEOLOGY

Historical and recent groundwater elevations recorded during GMEs are presented in Table C1, Appendix C, with inferred groundwater contours and flow directions presented in Figure 4A and Figure 4B, Appendix A, for the end of dry season 2023 and end of wet season 2024, respectively.

Groundwater levels fluctuate over wet and dry seasons, with the highest groundwater levels recorded in the late wet season and the lowest groundwater levels in the late dry season.

Groundwater levels fluctuated between 1.6 m bgl (MW001, located in the southeast corner of the base) and 6.6 m bgl (MW021D, located east of the base within the CTA) between the wet and dry seasons.

Inferred groundwater flow during the reporting period at the base was in a north-easterly direction and follows localised topography. This is consistent with previous investigations.

8.2 GROUNDWATER RESULTS

The highest PFAS concentrations during the monitoring period (October 2023 and March 2024) were detected within Source Area 1 at MW066 (consistent with the CSM), with concentrations of sum of PFOS+PFHxS reported at 0.36 µg/L and 0.16 µg/L (October 2023 and March 2024, respectively).

Groundwater at MW066 has historically had the highest concentrations of sum of PFOS+PFHxS (with maximum concentration of 1.71 µg/L reported in February 2018) measured on the base.

The maximum sum of PFOS+PFHxS concentrations outside PFAS source areas were reported at:

- MW034, located in the northeastern corner of the base, with concentrations of sum of PFOS+PFHxS reported at 0.12 µg/L and 0.1 µg/L (October 2023 and March 2024 respectively), and
- MW004, located in the southeastern corner of the base, with a concentration of 0.1 µg/L (at both October 2023 and March 2024 GMEs).

Concentrations of PFOS, PFHxS and/or PFOA in groundwater did not exceed previous maximum concentrations at any wells in this reporting period. New minimums were reported at fourteen locations during this reporting period, namely:

- Ten locations for new PFOS minimums,
- Ten locations for new sum of PFOS+PFHxS minimums, and
- Four locations for new PFOA minimums.

Refer to Table 7-5, Section 7.1.6 for a summary of new minimums. Most of the PFAS concentrations in groundwater were within historical ranges; however, some decreases were reported.

8.3 GROUNDWATER TRENDS

8.3.1 Overview

Groundwater analytical results are presented in Table C2, Appendix C. Temporal graphs and Mann-Kendall trend analysis outputs for sum of PFOS+PFHxS and PFOA concentrations in groundwater are included in Appendix D and Appendix E, respectively. The groundwater wells have been grouped into regions of interest, as summarised in Table 8-1 below.

Table 8-1. Summary of Groundwater Well Groupings

Region of Interest	Groundwater Locations	Temporal Graph Reference (Appendix D)
Source Area 1	MW066, MW012, MW012D, MW021, MW021D	Graph D1 and Graph D2
Northern Bores	MW023, MW032 and MW034	Graph D3 and Graph D4
Source Area 2 and 3	MW004, MW004D, MW018, MW031 and MW080	Graph D5 and Graph D6
Southern Bores	MW001, MW029 and MW030	Graph D7 and Graph D8
Shoal Bay Receiving Station	MW112 and MW113	Graph D9 and Graph D10

The Mann-Kendall trend test was used to analyse trends in groundwater constituent concentrations with time. Mann-Kendall analysis is a non-parametric test used to identify trends in time series data. The significance of a trend is determined by the confidence factor (i.e., *p value*) of the analysis, which was applied as follows:

- A confidence factor over 95 percent was selected to indicate a statistically significant *increasing* or *decreasing* trend, depending on the associated test statistic (positive indicating increasing, and negative indicating decreasing).
- A confidence factor between 90 to 95 percent was selected to indicate a *probably increasing* or *probably decreasing* trend
- A confidence factor less than 90 percent indicates *stable* or *no trend* in concentration over time.

Trend analysis was not undertaken for locations which consistently reported concentrations below the LOR. Within each dataset evaluated for trend, where individual sample results were less than the LOR, a value equal to half the LOR was adopted for the Mann-Kendall analysis.

8.3.2 Source Area 1

A summary of the groundwater concentration trends at Source Area 1 monitoring well locations is provided below.

- MW066 – located within Source Area 1
- MW012 and MW012D – located west and up-hydraulic gradient of Source Area 1
- MW021 and MW021D – located east and down-hydraulic gradient of Source Area 1

At downgradient location MW021D, a detectable sum of PFOS+PFHxS was reported in two monitoring rounds (February 2018 [0.02 µg/L] and March 2024 [0.03 µg/L]), at concentrations above the LOR of 0.01 µg/L.

The temporal trend analysis graphs (Graphs D1 and D2, Appendix D) show that monitoring well MW066 experiences the following seasonal fluctuations:

- When there is an increase in concentration of PFOA between wet and dry seasons, it has occurred at the end of the wet season (February 2018, April 2020, March 2023). However, this increase in concentration is not consistent after every wet season.

- There is no apparent seasonal trend for sum of PFOS+PFHxS, with increasing trends shown to occur both at the end of the wet season (such as February 2018, April 2020, March 2023) and the end of the dry season on two occasions (November 2021 and September 2022). The end of wet season 2024 (March 2024) showed a decreased concentration.

Results from all other monitoring wells were below the laboratory LOR for PFOA and sum of PFOS + PFHxS.

A summary of the statistical analysis results is presented in Table 8-2 below.

Mann-Kendall trend tests were not completed with data from MW012, MW012D, MW021 or MW021D, as most results were below the laboratory LOR for both PFOA and sum of PFOS+PFHxS.

Stable trends in groundwater concentrations of PFOA and sum of PFOS+PFHxS are indicated at MW066.

Table 8-2. Source Area Mann-Kendall Summary

Monitoring Well	Analyte	Historical Range	Current Monitoring Period	Mann-Kendall Trend	
		Min. – Max. (µg/L)	Min. – Max. (µg/L)	Trend	Confidence Factor
MW066	PFOA	0.01 – 0.09	0.02	Stable	66.6%
	Sum of PFOS+PFHxS	0.33 – 1.71	0.34 – 0.45	Stable	77.2%
MW012	PFOA	<0.01	<0.01	*n/a*[1]	*n/a*[1]
	Sum of PFOS+PFHxS	<0.01	<0.01	*n/a*[1]	*n/a*[1]
MW012D	PFOA	<0.01	<0.01	*n/a*[1]	*n/a*[1]
	Sum of PFOS+PFHxS	<0.01	<0.01	*n/a*[1]	*n/a*[1]
MW021	PFOA	<0.01	<0.01	*n/a*[1]	*n/a*[1]
	Sum of PFOS+PFHxS	<0.01	<0.01	*n/a*[1]	*n/a*[1]
MW021D	PFOA	<0.01	<0.01	*n/a*[1]	*n/a*[1]
	Sum of PFOS+PFHxS	<0.01 – 0.02	0.03	*n/a*[1]	*n/a*[1]

Notes:
1. *n/a* indicates insufficient data to conduct Mann-Kendall analysis

8.3.3 Northern Monitoring Wells

A summary of the Northern monitoring well locations is provided below.

- MW032 and MW034 – located on the northwestern boundary of the base
- MW023 – located in the CTA, east of the northern portion of the base.

Mann-Kendall trend analysis was not completed for MW023 PFOA and sum of PFOS+PFHxS concentrations, or for MW032 PFOA concentrations, as all results were below the laboratory LORs for those analytes.

The temporal graphs (Graph D3 and Graph D4, Appendix D) indicate the following seasonal fluctuations:

- MW032 – From 2019, concentrations of sum of PFOS+PFHxS were generally reported to be higher at the end of the dry season than those reported at the end of wet season, indicating a potential dilution effect. This location is approximately 700 m north, and cross-gradient, from the nearest source area and would receive rainfall infiltration from areas not impacted by PFAS, resulting in potential dilution.

- MW034 – When there is an increase in the concentration of both PFOA and sum of PFOS+PFHxS between wet and dry seasons, it has occurred at the end of the dry season (December 2019, November 2020, November 2021, October 2023); however, it has not occurred consistently after every dry season.

A summary of statistical analysis results is presented in Table 8-3 below.

There was no trend reported for sum of PFOS+PFHxS at MW032 and PFOA at MW034. A statistically significant increasing trend for sum of PFOS+PFHxS is shown at MW034.

Table 8-3. Northern Monitoring Wells Mann-Kendall Summary

Monitoring Well	Analyte	Historical Range	Current Monitoring Period	Mann-Kendall Trend	
		Min. – Max. (µg/L)	Min. – Max. (µg/L)	Trend	Confidence Factor
MW023	PFOA	<0.01	<0.01	*n/a*[1]	*n/a*[1]
	PFOA	<0.01	<0.01	*n/a*[1]	*n/a*[1]
MW032	PFOA	<0.01	<0.01	*n/a*[1]	*n/a*[1]
	Sum of PFOS+PFHxS	<0.01 – 0.09	0.06	No trend	78.2%
MW034	PFOA	<0.01 – 0.03	<0.01 – 0.015	No trend	61.5%
	Sum of PFOS+PFHxS	0.02 – 0.21	0.13 – 0.15	Increasing	99.7%

Notes:
1. *n/a* indicates insufficient data to conduct Mann-Kendall analysis

8.3.4 Source Area 2 and 3 Monitoring Wells

A summary of the monitoring well locations in Source Areas 2 and 3 is provided below.

- MW004 and MW004D, located within Source Area 2
- MW031, located east of Source Area 2, on the eastern boundary of the base
- MW080, located immediately northeast of Source Area 3

Temporal graphs and Mann-Kendall trend analysis were not completed for PFOA and sum of PFOS+PFHxS data at MW004D and MW031, and PFOA at MW004 and MW080, as either all or the majority of results were below the laboratory LORs.

The temporal graphs (Graph D5 and D6, Appendix D) do not indicate any apparent temporal trends in PFOA and sum of PFOS+PFHxS concentrations.

A summary of statistical analysis results is presented in Table 8-4 below.

A stable trend is reported for sum of PFOS+PFHxS at MW004, and no trend is reported for sum of PFOS+PFHxS at MW080.

Table 8-4. Source Area 2 and 3 Mann-Kendall Summaries

Monitoring Well	Analyte	Historical Range	Current Monitoring Period	Mann-Kendall Trend	
		Min. – Max. (µg/L)	Min. – Max. (µg/L)	Trend	Confidence Factor
MW004	PFOA	<0.01	<0.01	*n/a*[1]	*n/a*[1]
	Sum of PFOS+PFHxS	0.04 – 0.44	0.13	Stable	53.5%
MW004D	PFOA	<0.01	-[2]	*n/a*[1]	*n/a*[1]
	Sum of PFOS+PFHxS	<0.01 – 0.03	-[2]	*n/a*[1]	*n/a*[1]
MW031	PFOA	<0.01	-[2]	*n/a*[1]	*n/a*[1]
	Sum of PFOS+PFHxS	<0.01 – 0.03	-[2]	*n/a*[1]	*n/a*[1]
MW080	PFOA	<0.01	-[2]	*n/a*[1]	*n/a*[1]
	Sum of PFOS+PFHxS	<0.01 – 0.12	0.02 – 0.03	No trend	68.4%

Notes:
1. *n/a* indicates insufficient data to conduct Mann-Kendall analysis
2. - indicates the well wasn't sampled in the current monitoring period

8.3.5 Southern Monitoring Wells

A summary of the Southern monitoring well locations is provided below:

- MW001 and MW030 – located on the southeastern boundary of the base
- MW029 – located approximately 150 m south of MW001 and MW030

Temporal graphs and Mann-Kendall trend analysis were not completed for PFOA or sum of PFOS+PFHxS at MW029, or for PFOA at MW001 and MW030, as either all or the majority of results were below the laboratory LOR for those analytes.

The temporal graphs are provided as Graph G7 and Graph G8, Appendix D.

Except for a single sampling event in April 2020 at the end of the wet season, where MW001 recorded an increased concentration of the sum of PFOS+PFHxS (the highest reported concentration, 0.35 µg/L), concentrations of sum of PFOS+PFHxS at MW001 and MW030 have generally decreased in monitoring events conducted at the end of the wet season. This trend suggests a potential dilution effect. These wells are located approximately 300 m away and cross-gradient from the nearest source area and likely receive rainfall infiltration from areas unaffected by PFAS, contributing to dilution.

A summary of statistical analysis results is presented in Table 8-5 below. A stable trend was reported for MW001 and decreasing trend for MW030 for sum of PFOS+PFHxS.

Table 8-5. Southern Monitoring Wells Mann-Kendall Summary

Monitoring Well	Analyte	Historical Range	Current Monitoring Period	Mann-Kendall Trend	
		Min. – Max. (µg/L)	Min. – Max. (µg/L)	Trend	Confidence Factor
MW001	PFOA	<0.01	<0.01	*n/a*[1]	*n/a*[1]
	Sum of PFOS+PFHxS	0.12 – 0.35	0.055 – 0.14	Stable	94.3%
MW029	PFOA	<0.01	<0.01	*n/a*[1]	*n/a*[1]
	Sum of PFOS+PFHxS	<0.01	<0.01	*n/a*[1]	*n/a*[1]
MW030	PFOA	<0.01 – 0.01	<0.01	*n/a*[1]	*n/a*[1]
	Sum of PFOS+PFHxS	0.11 – 0.40	0.11	Decreasing	96.2%

Notes:
1. *n/a* indicates that there was insufficient data to conduct Mann-Kendall analysis
2. - indicates the well wasn't sampled in the current monitoring period

8.3.6 Shoal Bay Receiving Station Monitoring Wells

Groundwater bores MW112 and MW113 are both located within the SBRS, approximately 5 km north of the base.

Temporal graphs and Mann-Kendall trend analysis were not completed for PFOA and sum of PFOS+PFHxS at MW112 or MW113, as all results have been below the laboratory LOR for these analytes.

A summary of results is presented in Table 8-6 below.

Table 8-6. Shoal Bay Receiving Station Mann-Kendall Summary

Monitoring Well	Analyte	Historical Range	Current Monitoring Period	Mann-Kendall Trend	
		Min. – Max. (µg/L)	Min. – Max. (µg/L)	Trend	Confidence Factor
MW112	PFOA	<0.01	<0.01	*n/a*[1]	*n/a*[1]
	Sum of PFOS+PFHxS	<0.01	<0.01	*n/a*[1]	*n/a*[1]
MW113	PFOA	<0.01	<0.01	*n/a*[1]	*n/a*[1]
	Sum of PFOS+PFHxS	<0.01	<0.01	*n/a*[1]	*n/a*[1]

8.4 SURFACE WATER RESULTS

The PFAS analytical results for surface water, tabulated against adopted guidelines, are provided in Table C4, Appendix C. A summary of PFOA and sum of PFOS+PFHxS concentrations in surface water is presented in Figure 6A and Figure 6B, Appendix A, respectively.

8.5 SURFACE WATER TRENDS

8.5.1 Overview

Surface water analytical results are presented in Table C4, Appendix C. Temporal graphs and Mann-Kendall outputs for sum of PFOS+PFHxS and PFOA concentrations in surface water are included in Appendix D and Appendix E, respectively. The surface water sampling locations have been segregated into two broad areas as set out in Table 8-7 below.

Table 8-7. Summary of Surface Water Location Areas

Area	Surface Water Monitoring Locations	Temporal Graph Reference (Appendix D)
Base Drainage Lines	SW001, SW007, SW023, SW028, SW059 and SW075 (located off-base)	Graph D11, Graph D12
Close Training Area	SW086, SW091 and SW123	Graph D13, Graph D14

8.5.2 Base Drainage Lines

Six surface water locations are sampled to monitor stormwater runoff from the base drainage, namely:

- SW001 – located south of, and leading from, Source Areas 2 and 3
- SW007 – located west of Source Areas 2 and 3 along the southern boundary of the base
- SW023 – located in the central portion of the base, south of Source Area 1
- SW028 – located on the western portion of the base, west of Source Area 1
- SW059 – located on the eastern base border, northeast of Source Area 1
- SW075 – located south of the south-western portion of the base.

Temporal plots of surface water concentrations at these locations are presented in Graph D11 and Graph D12, Appendix D.

Temporal graphs and Mann-Kendall trend analysis were not completed for PFOA at any surface water locations nor for sum of PFOS+PFHxS at SW023 and SW028, as all or the majority of results were below the laboratory LOR.

The following was observed from the temporal trend graphs for sum of PFOS+PFHxS at SW001, SW059 and SW075:

- SW001 and SW075 – no evident seasonal variation.
- SW059 – seasonal variations were observed for sum of PFOS+PFHxS, with higher concentrations reported at the end of wet season sampling events, indicating surface water runoff from Source Area 1 may be contributing to concentrations measured in surface water at this location.

A summary of statistical analysis results is presented in Table 8-8 below.

Surface water locations reported a stable trend at SW001 and SW007, and no trend at SW059 and SW075 for sum of PFOS+PFHxS.

Table 8-8. Base Drainage Lines Mann-Kendall Summary

Monitoring Well	Analyte	Historical Range	Current Monitoring Period	Mann-Kendall Trend	
		Min. – Max. (µg/L)	Min. – Max. (µg/L)	Trend	Confidence Factor
SW001	PFOA	<0.01	<0.01	*n/a*[1]	*n/a*[1]
	Sum of PFOS+PFHxS	<0.01 – 0.09	0.01	Stable	91.8%
SW007	PFOA	<0.01 – 0.01	<0.01	*n/a*[1]	*n/a*[1]
	Sum of PFOS+PFHxS	<0.01 – 0.06	<0.01 – 0.08	Stable	91.3%
SW023	PFOA	<0.01 – 0.03	<0.01	*n/a*[1]	*n/a*[1]
	Sum of PFOS+PFHxS	<0.01 – 0.01	<0.01	*n/a*[1]	*n/a*[1]
SW028	PFOA	<0.01	<0.01	*n/a*[1]	*n/a*[1]
	Sum of PFOS+PFHxS	<0.01 – 0.18	<0.01	*n/a*[1]	*n/a*[1]
SW059	PFOA	<0.01 – 0.03	<0.01	*n/a*[1]	*n/a*[1]
	Sum of PFOS+PFHxS	<0.01 – 0.67	0.076 – 0.19	No Trend	59.0%
SW075	PFOA	<0.01 – 0.01	<0.01	*n/a*[1]	*n/a*[1]
	Sum of PFOS+PFHxS	<0.01 – 0.19	0.10	No Trend	75.2%

Notes:
1. *n/a* indicates that there was insufficient data to conduct Mann-Kendall analysis.

8.5.3 Close Training Area

Three surface water locations monitor surface water in the CTA, namely:

- SW086 – located on the western boundary of the CTA monitoring area, east of the central portion of the base
- SW091 – located on the north-eastern corner of the Management Area within the CTA
- SW123 – located in the central northern portion of the CTA

Temporal surface water concentrations for these locations are presented graphically in Graph D13 and Graph D14, Appendix D.

Temporal trend and Mann-Kendall analysis could not be completed for PFOA at any surface water locations as all or majority of results were below laboratory LOR. Temporal trend and Mann-Kendall analysis could not be completed at SW086 for sum of PFOS+PFHxS, as all or majority of results were below laboratory LOR for those analytes.

The following was observed from the temporal trend graphs for sum of PFOS+PFHxS for SW091 and SW123:

- SW091 – seasonal variation was observed, with higher concentrations of sum of PFOS+PFHxS reported at the end of dry season sampling events. This suggests potential dilution of PFAS concentrations at the end of wet season. Surface water in this area would receive rainfall infiltration from areas not impacted by PFAS, likely resulting in dilution at the end of wet season.
- SS123 – no apparent seasonal variation was observed.

A summary of statistical analysis results is presented in Table 8-9 below.

SW091 and SW123 both reported a stable trend for sum of PFOS+PFHxS

Table 8-9. Source Area 2 and 3 Mann-Kendall Summaries

Monitoring Well	Analyte	Historical Range	Current Monitoring Period	Mann-Kendall Trend	
		min–max (µg/L)	min–max (µg/L)	Trend	Confidence Factor
SW086	PFOA	<0.01	<0.01	*n/a*[1]	*n/a*[1]
	Sum of PFOS+PFHxS	<0.01–0.01	<0.01	*n/a*[1]	*n/a*[1]
SW091	PFOA	<0.01	<0.01	*n/a*[1]	*n/a*[1]
	Sum of PFOS+PFHxS	<0.01–0.08	0.05	Stable	66.6%
SW123	PFOA	<0.01–0.15	<0.01	*n/a*[1]	*n/a*[1]
	Sum of PFOS+PFHxS	<0.01–0.34	0.16–0.18	Stable	90.8%

Notes:
1. *n/a* indicates insufficient data to conduct Mann-Kendall analysis.

8.6 SUMMARY

The nature and extent of PFAS in groundwater and surface water is consistent with the previous monitoring events (AECOM, 2024a).

9. CONCEPTUAL SITE MODEL

The CSM was developed during the DSI (Senversa, 2018a) and summarised in the PMAP (Defence, 2018), and it has been recently updated in in the following subsequent report:

- Tetra Tech Coffey, PFAS Investigation and Management Robertson Barracks, Site Review Assessment Report, July 2024 (Tetra Tech Coffey, 2024).

9.1 CONCEPTUAL SITE MODEL REVIEW

The groundwater and surface water results from this reporting period have been compared to the CSM, with the following key findings included in the review:

- All the PFAS concentrations in groundwater and surface water were within or below historical ranges.
- Mann-Kendall statistical trend analysis of groundwater data showed the following:
  - Most results for both groundwater and surface water (where there were sufficient detections to undertake Mann-Kendall analysis) reported stable or no trends.
  - Only one groundwater well location - MW034, located on the northeast base boundary- reported an increasing trend; however, down-gradient groundwater well (MW032) reported no trend.
  - Groundwater well MW030 (located on the south-eastern boundary of the base) reported a decreasing concentration.
  - Concentrations of PFAS in groundwater are highest at PFAS Source Area 1; however, they have remained stable.

The data presented in this report do not change the overall assessment of CSM sources, pathways and/or risks to receptors as described in the updated CSM below.

9.2 UPDATED CONCEPTUAL SITE MODEL

9.2.1 Sources of PFAS

From approximately 2004, Defence commenced phasing out of legacy AFFF (generally 3M Lightwater™ AFFF formulation) across the Defence Estate, and therefore the primary source of PFAS impact is no longer present at Robertson Barracks. However, the impacted environmental media at the base is providing an ongoing (secondary) source of PFAS impacts. The residual secondary sources (as outlined in Section 9.2.2 below) are being managed in accordance with the recommendations in the PMAP (Defence, 2018).

During the DSI (Senversa, 2018a), several areas where legacy AFFF was historically used and released into the environment were identified. A review of previous environmental assessments and site history highlighted key locations as the likely primary sources of PFAS contamination due to historical storage, use, and disposal of AFFF. The DSI confirmed PFAS impacts in three specific source areas, suggesting that legacy AFFF was not widely used across Robertson Barracks.

PFAS concentrations were detected in the following source areas:

- **Source Area 1:** The former ERS compound within Building 137 and its immediate surroundings.
- **Source Area 2:** Combat Service Support Brigade Elements compound, where the ERS previously parked their trucks before relocating to Building 137.
- **Source Area 3:** Wash-down bays and refuelling areas in the southern portion of Robertson Barracks, where the drainage network also converges.

9.2.2 Pathways for PFAS Migration

Potential pathways for the migration of PFAS include the following:

- Leaching and migration from impacted soils or pavements into groundwater or surface water.
- Lateral migration of PFAS in groundwater with the flow of the aquifer.
- Potential extraction of groundwater for irrigation use.
- Discharge of groundwater into surface waters and associated sediments. This includes discharge of groundwater into unlined and lined stormwater drains.
- Surface water runoff from PFAS sources to site drains, depressions, open pits and surrounding creeks.
- Migration of PFAS in surface water (site drains and surrounding creeks) to down-stream areas.
- Infiltration of PFAS-impacted surface water into soil and groundwater.
- Uptake of PFAS from sediment, groundwater, and surface water by biota.

The primary pathways for PFAS migration from sources to receptors at the base is via surface water.

Sediment transport along drainage lines was investigated during the DSI and through subsequent ongoing monitoring and was considered to result in limited PFAS movement at the base. This is because most drains are dry through the dry season and only contain minimal flows after heavy rainfall in the wet season.

9.2.3 Receptors

Receptors of PFAS at and off the base were identified in the HHERA (Senversa, 2018b) are summarised in Table 9-1 below. All receptors listed below remain relevant.

Table 9-1. Receptors within and outside the Monitoring Area

Human Receptors	Ecological receptors
In the monitoring area • Robertson Barracks and CTA site personnel (including commercial workers) • Residents (adults and children) in the accommodation area of Robertson Barracks • Users (adults and children) of the childcare facility on Robertson Barracks • Intrusive workers on Robertson Barracks, CTA and the southern drainage channel[1] • Recreational users of the southern drainage channel and MTR Outside the monitoring area • Intrusive workers at the MTR[1] • Recreational users of the MTR[1] • Residents[2] and commercial workers[2,3] of the surrounding land	In the monitoring area • Terrestrial flora and fauna on Robertson Barracks (less significant than in the CTA) • Aquatic flora and fauna accessing drains on Robertson Barracks (less significant than in the CTA) • Terrestrial flora and fauna on around the southern drainage channel and in the CTA Outside the monitoring area • Terrestrial flora and fauna on around the MTR • Terrestrial flora and fauna in Milners Swamp

Notes:
1. The CTA, MTR and southern drainage channel are not areas with consistent commercial style workers.
2. There are no down-gradient residential receptors. A holiday resort is located approximately 1 km southeast of the base within a commercial/industrial area.
3. The nearest commercial area is located to the south of the base on Glendower Road.

10. RISK PROFILE REVIEW

The data collected during this OMP reporting period (October 2023 to March 2024), when combined with the historical monitoring conducted at the base to date, suggest that the risk profile to human health and ecological receptors within the PFAS Management Area is overall unchanged since the publication of the HHERA (Senversa, 2018b). This is discussed further in the sections below.

10.1 GROUNDWATER

A summary of changes in concentrations using Mann-Kendall trend analysis between this OMR and the previous interpretive report (AECOM, 2024a) is presented in Table 10-1 below. Green shading represents a reducing trend (e.g. from *increasing trend* to *decreasing*, *stable,* or *no trend*), and orange shading represents the trend has changed from a *decreasing* trend to a *stable* trend, or to an *increasing* trend when it wasn't previously.

Although concentrations in MW034 was reported as statistically *increasing*, current PFAS is lower than highest historical concentrations recorded in November 2021 (sum of PFOS+PFHxS at 0.21 µg/L and PFOS at 0.15 µg/L). Down hydraulic gradient well MW032 which was previously *increasing* improved to *stable* in this OMR. Whilst up hydraulic gradient well MW012/MW012D have always reported PFAS concentrations at below LOR.

Several wells also reported change from *increasing* to *no trend* or *stable* indicating a potential general improvement in PFAS contamination in groundwater. However, it is noted that concentrations appear to fluctuate seasonally which may be attributed to seasonal variation in particular due to rainfall variability between the dry and wet season. Statistical trends will be further assessed in the next OMR.

Table 10-1. Summary of Changes in Mann-Kendall Trend Analysis

Location	Monitoring Well	Analyte	Mann-Kendall Trend in Previous Interpretive Report	Mann-Kendall Trend in this OMR
Source Area 1	MW066	PFOA	Stable	Stable
		Sum of PFOS+PFHxS	Stable	Stable
	MW032	Sum of PFOS+PFHxS	Increasing	No Trend
	MW034	PFOA	No Trend	No Trend
		Sum of PFOS+PFHxS	Increasing	Increasing
Source Areas 2 and 3	MW004	Sum of PFOS+PFHxS	Increasing	Stable
	MW080	Sum of PFOS+PFHxS	Increasing	No Trend
		Sum of PFOS+PFHxS	Stable	No Trend

Notes:
Green shading indicates the trend has changed from increasing to *decreasing, stable,* or *no trend*. No shading indicates no change in trends.

10.2 SURFACE WATER

Concentrations of PFAS in surface water were within historical ranges reported throughout the Management Area and were consistent with the concentrations used to develop the HHERA (Senversa, 2018b). All surface water PFAS concentrations were below health-based recreational screening criteria, consistent with previous results.

11. CONCLUSIONS

Groundwater and surface water sampling was undertaken between October 2023 and March 2024.

The results for the reporting period indicate the nature and extent of PFAS in groundwater and surface water are consistent with previous findings.

The CSM was reviewed, and based on the results presented within this report, no changes are identified to sources, pathways or risks to receptors at the base and within the Management Area.

The monitoring conducted over the reporting period is considered to have met the objectives of the SAQP and OMP. The OMP has since been reviewed and a revised OMP was issued in 2025 (Defence, 2025).

12. REFERENCES

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APPENDIX A: FIGURES

Figure 1 **Robertson Barracks PFAS Monitoring Area**

Figure 2 **Groundwater sampling locations**

Figure 3 **Surface water sampling locations**

Figure 4A **Inferred groundwater flow direction – October 2023**

Figure 4B **Inferred groundwater flow – March 2024**

Figure 5A **Groundwater analytical results –Sum of PFOS+PFHxS**

Figure 5B **Groundwater analytical results – PFOA**

Figure 6A **Surface water analytical results –Sum of PFOS+PFHxS**

Figure 6B **Surface water analytical results – PFOA**

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714,000 715,200 716,400 717,600 718,800 720,000 721,200 722,400 723,600 724,800 726,000 727,200

8,632,800 8,631,600 8,630,400 8,629,200 8,628,000 8,626,800 8,625,600 8,624,400 8,623,200 8,622,000 8,620,800

Source area 1

Source area 2

Source area 3

Robertson Barracks

Close Training Area

0 500 1,000 m

LEGEND

- Shoal bay receiving station
- Road
- PFAS Source areas
- Management area
- Marksmanship Training Range (MTR)
- Close Training Area
- Robertson Barracks

SOURCE
PFAS areas, Management area, MTR area and Site boundary (Indicative) from Tetra Tech Coffey
Roads, tracks, and creeks from DoD.
Imagery from Nearmap (06-06-2023).

N

0 500 1,000 m

SCALE **1:48,000**
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DEPARTMENT OF DEFENCE

ROBERTSON BARRACKS ONGOING MONITORING REPORT (OCTOBER 2023 – MARCH 2024)

FIGURE 1

Robertson Barracks PFAS Monitoring Area

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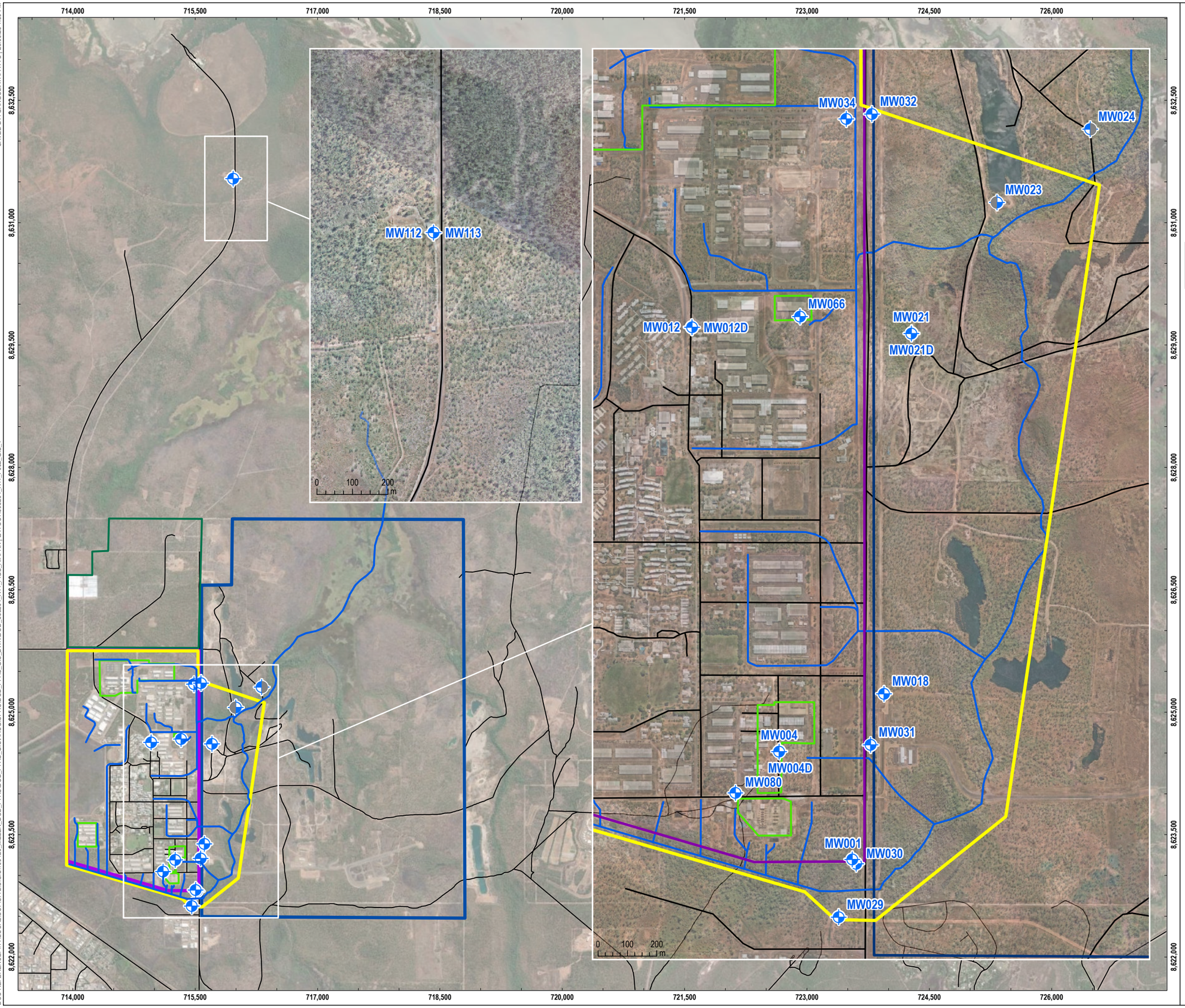

LEGEND

- Groundwater sampling location
- Not sampled End of wet season (2024)
- Not sampled End of dry season (2023)
- Road
- Drain
- PFAS Source areas
- Management area
- Marksmanship Training Range (MTR)
- Close Training Area
- Robertson Barracks

Well	Comment
MW023	Dry in 2023
MW024	Alternative well to MW023 in 2023. Not sampled in 2024

SOURCE
Locations, PFAS areas, Management area, MTR area and Site boundary (Indicative) from Tetra Tech Coffey
Roads, tracks, and drains from DoD.
Imagery from Nearmap (06-06-2023).

0 750 1,500 m

SCALE **1:45,000**
PAGE SIZE: **A3**
PROJECTION: **GDA 1994 MGA Zone 52**

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ROBERTSON BARRACKS ONGOING MONITORING REPORT (OCTOBER 2023 – MARCH 2024)

FIGURE 2

Groundwater sampling locations

TETRA TECH COFFEY

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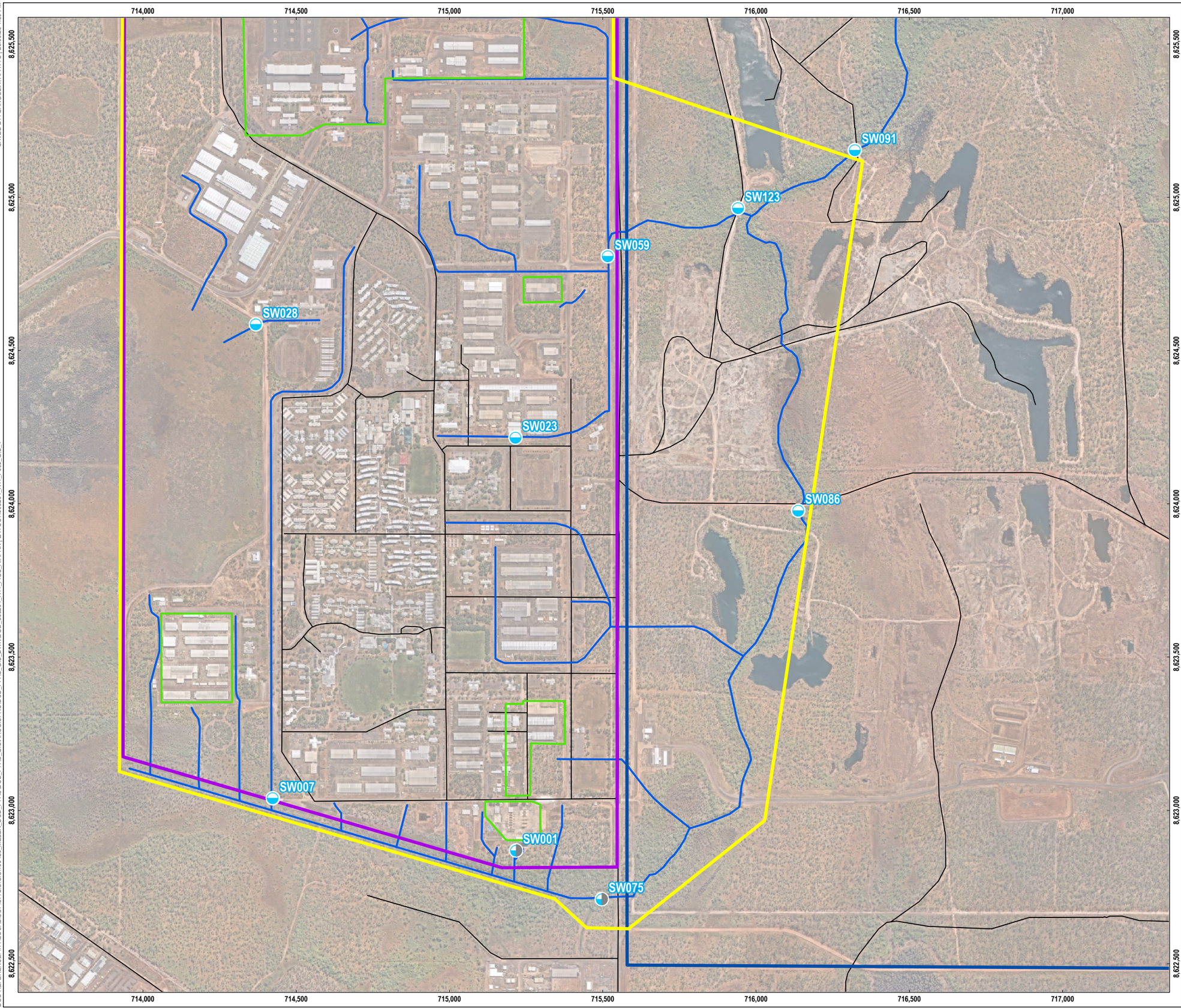

LEGEND

- Surface water sampling location
- Not sampled End of dry season (2023)
- Not sampled End of wet season (2024)
- Road
- Drain
- Management area
- Marksmanship Training Range (MTR)
- PFAS Source areas
- Close Training Area
- Robertson Barracks

Well	Comment
SW001	Locations were visited and sampled, however, the lab did not analyse the sampled and disposed of them prior to analysis
SW075	

SOURCE
Locations, PFAS areas, Management area, MTR area and Site boundary (Indicative) from Tetra Tech Coffey
Roads, tracks, and drains from DoD.
Imagery from Nearmap (06-06-2023).

0 250 500 m

SCALE **1:12,000**
PAGE SIZE: **A3**
PROJECTION: **GDA 1994 MGA Zone 52**

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ROBERTSON BARRACKS ONGOING MONITORING REPORT (OCTOBER 2023 – MARCH 2024)

FIGURE 3

Surface water sampling locations

TETRA TECH COFFEY

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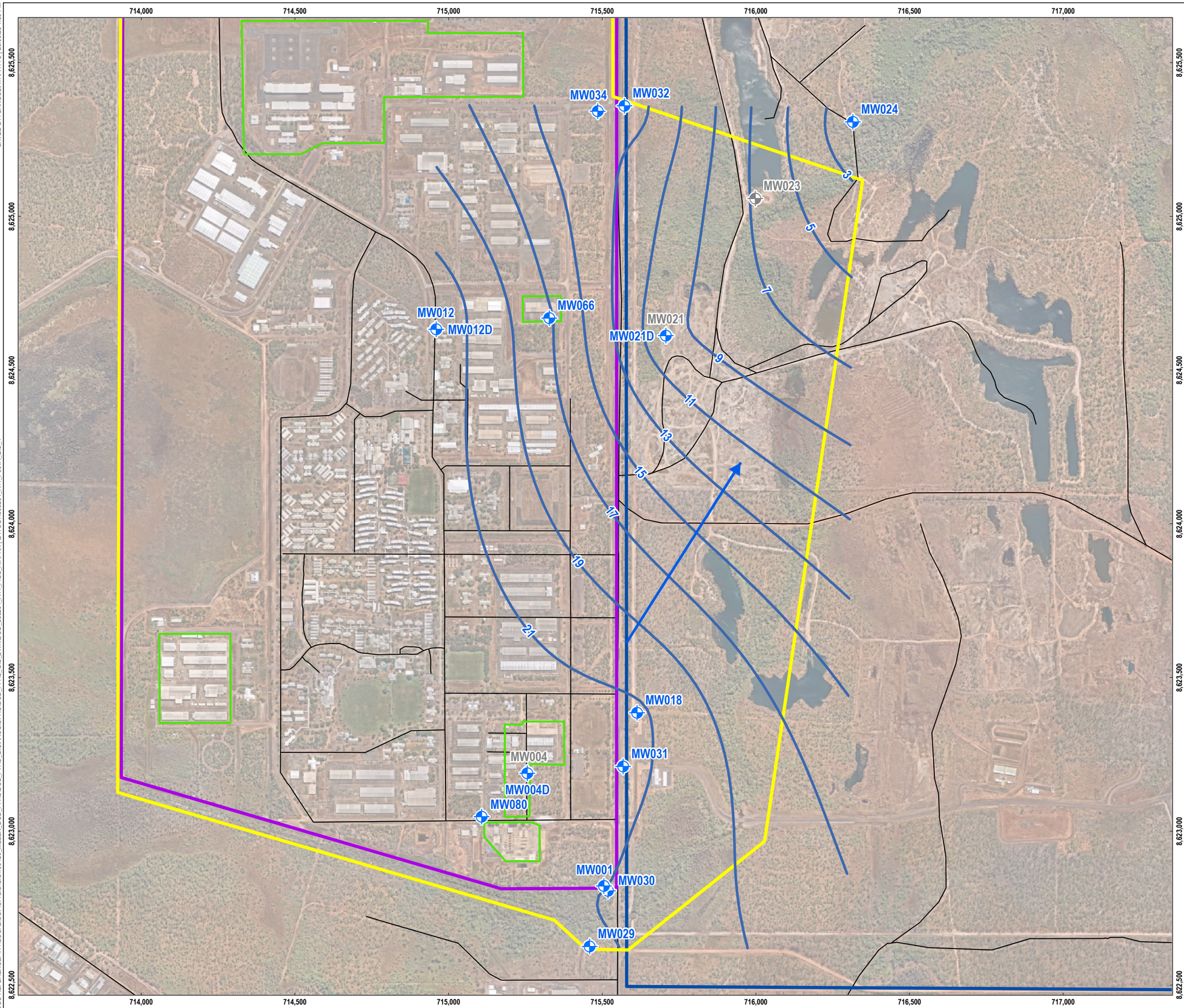

LEGEND

- Groundwater sampling location
- Locations not sampled
- Groundwater contour (mAHD)
- Road
- Inferred groundwater direction
- Management area
- Marksmanship Training Range (MTR)
- PFAS Source areas
- Close Training Area
- Robertson Barracks

SOURCE
Locations, PFAS areas, Management area, MTR area and Site boundary (Indicative) from Tetra Tech Coffey
Roads, tracks, and drains from DoD.
Imagery from Nearmap (06-06-2023).

0 200 400 m

SCALE **1:12,000**
PAGE SIZE: **A3**
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ROBERTSON BARRACKS ONGOING MONITORING REPORT (OCTOBER 2023 – MARCH 2024)

FIGURE 4A

Inferred groundwater flow direction October 2023

TETRA TECH COFFEY

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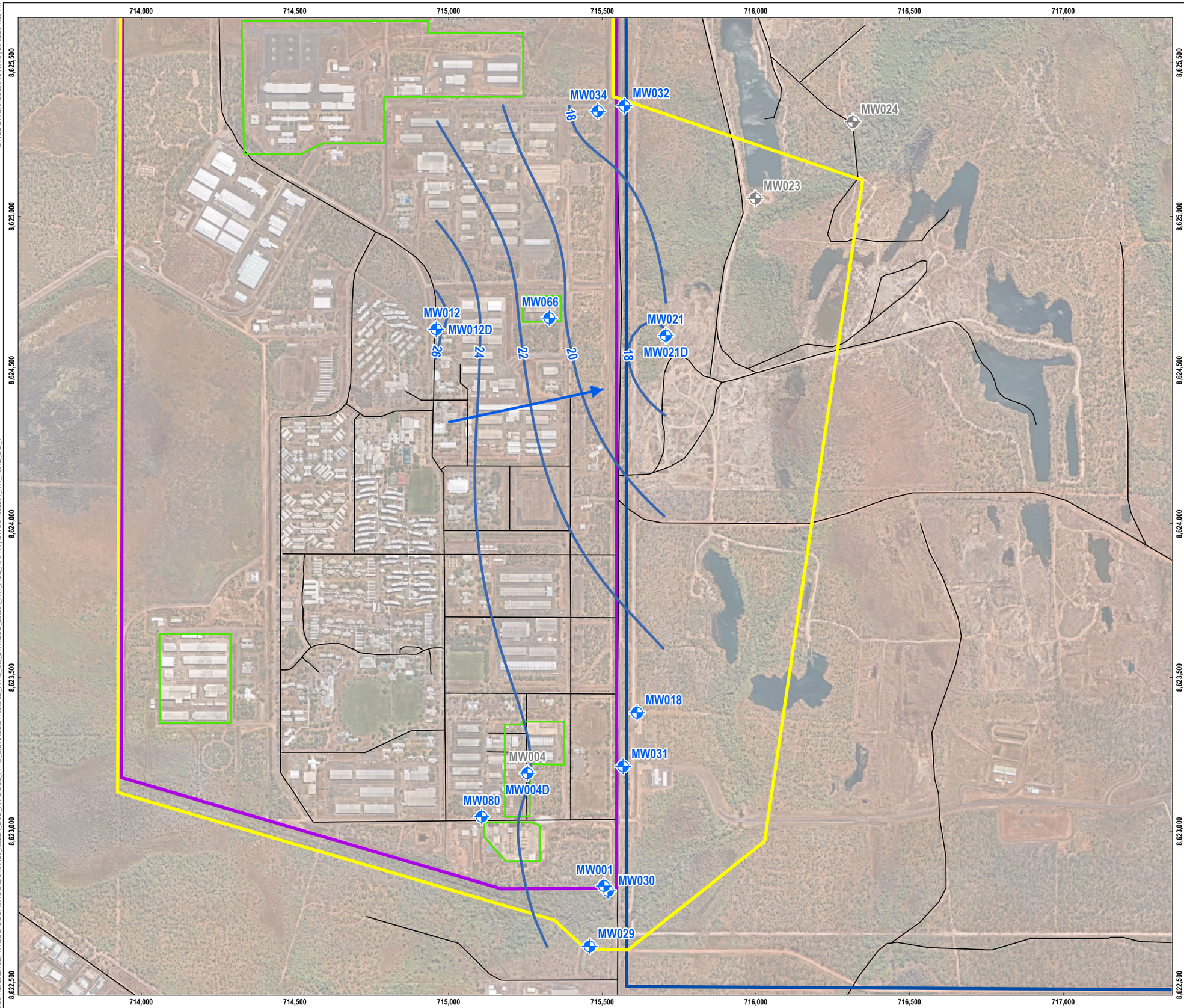

LEGEND

- Groundwater sampling location
- Locations not sampled
- Groundwater contour (mAHD)
- Road
- Inferred groundwater direction
- Management area
- Marksmanship Training Range (MTR)
- PFAS Source areas
- Close Training Area
- Robertson Barracks

SOURCE
Locations, PFAS areas, Management area, MTR area and Site boundary (Indicative) from Tetra Tech Coffey
Roads, tracks, and drains from DoD.
Imagery from Nearmap (06-06-2023).

0 200 400 m

SCALE **1:12,000**
PAGE SIZE: **A3**
PROJECTION: **GDA 1994 MGA Zone 52**

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ROBERTSON BARRACKS ONGOING MONITORING REPORT (OCTOBER 2023 – MARCH 2024)

FIGURE 4B

Inferred groundwater flow March 2024

TETRA TECH COFFEY

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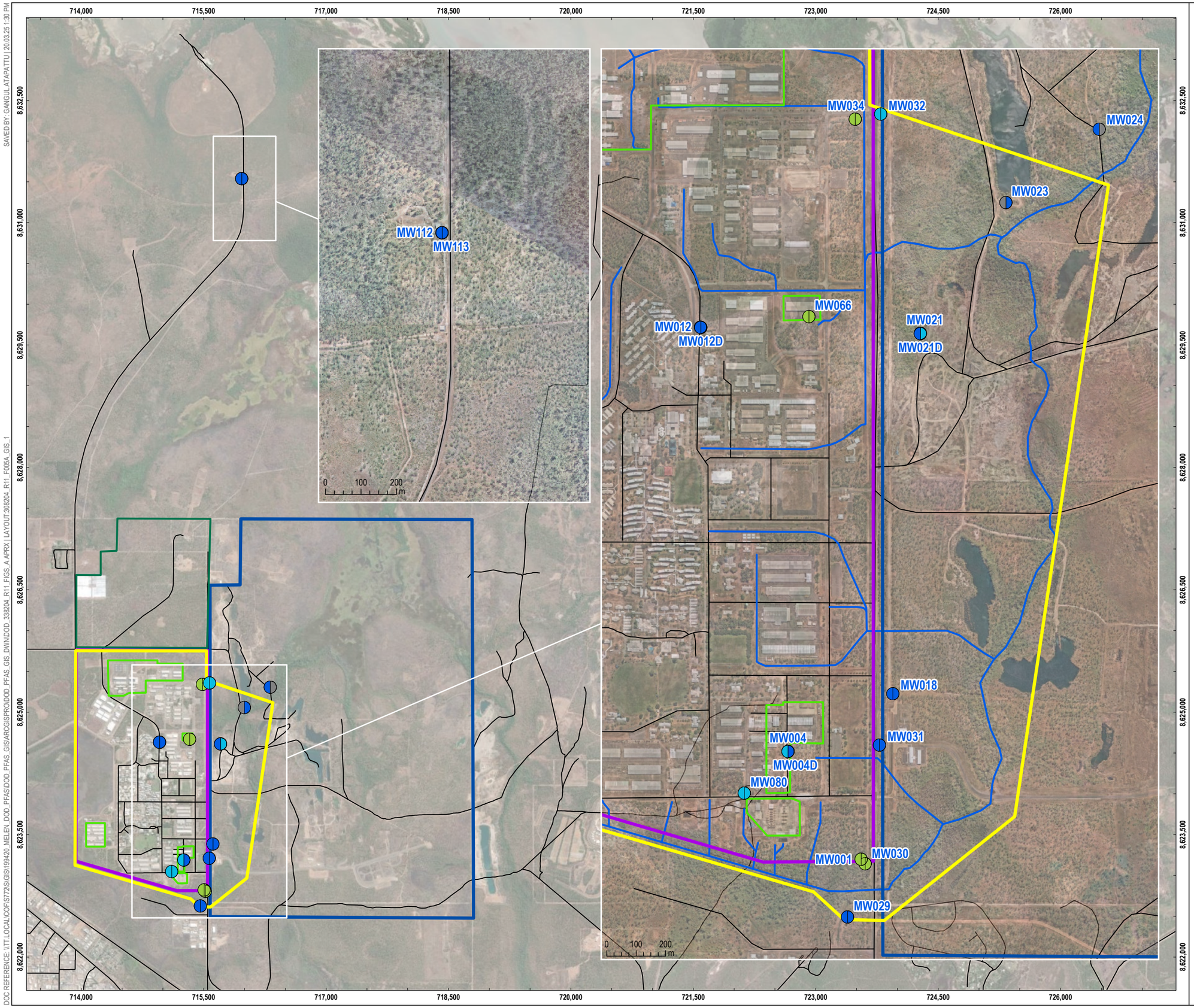

LEGEND

Sum of PFOS and PFHxS

- Below LOR
- LOR to 0.07 µg/L
- 0.07 to 0.7 µg/L
- 0.7 to 7 µg/L
- 7 to 70 µg/L
- >= 70 µg/L
- Sampled in Dry season (2023)
- Sampled in Wet season (2024)
- Drain
- Road
- Management area
- Marksmanship Training Range (MTR)
- PFAS Source areas
- Close Training Area
- Robertson Barracks

SOURCE
Locations, PFAS areas, Management area, MTR area and Site boundary (Indicative) from Tetra Tech Coffey
Roads, tracks, and drains from DoD.
Imagery from Nearmap (06-06-2023).

0 750 1,500 m

SCALE **1:45,000**
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ROBERTSON BARRACKS ONGOING MONITORING REPORT (OCTOBER 2023 – MARCH 2024)

FIGURE 5A

Groundwater analytical results PFOS+PFHxS

TETRA TECH COFFEY

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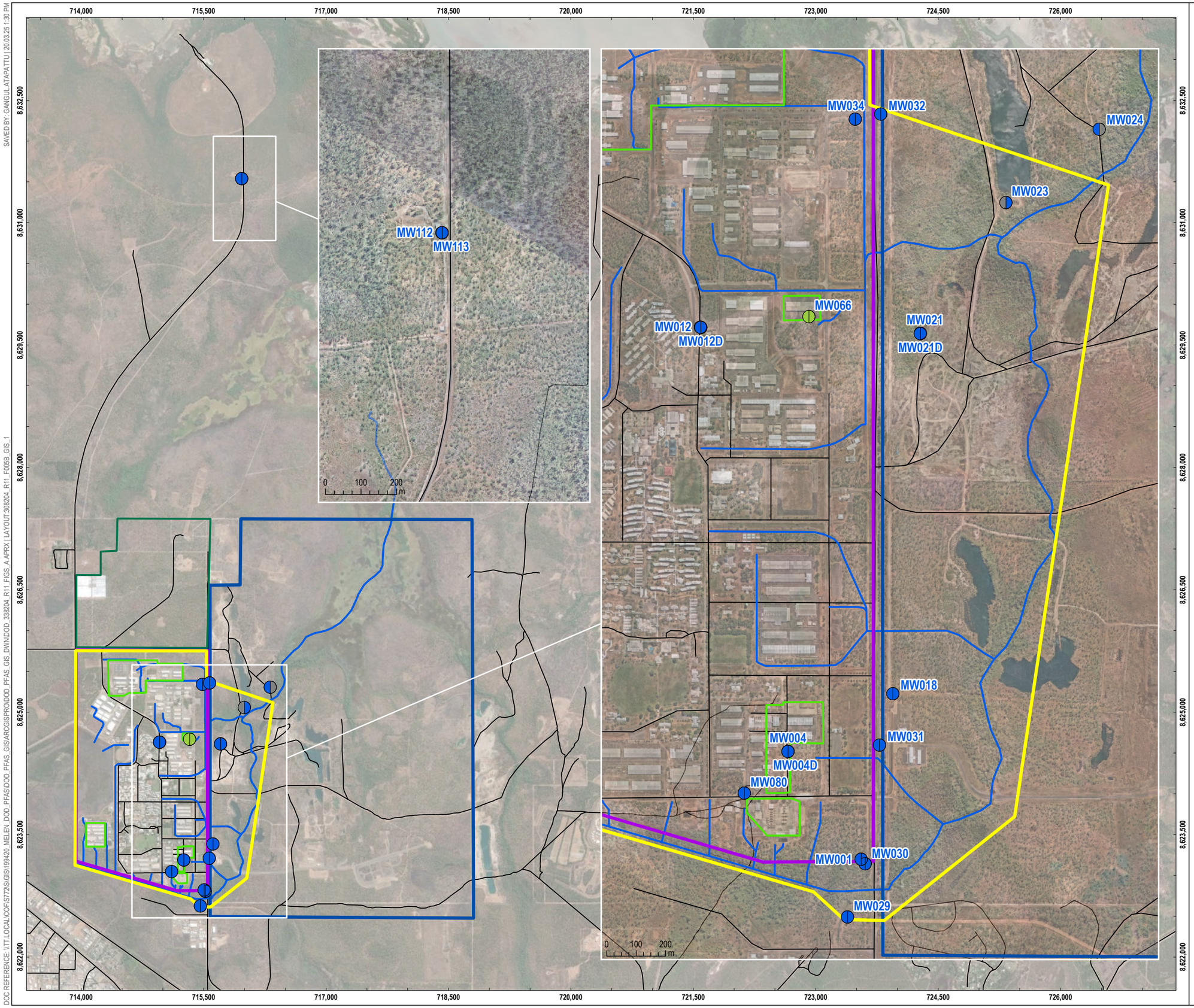

LEGEND

PFOA Concentration

- Below LOR
- LOR to 0.56 µg/L
- 0.56 to 5.6 µg/L
- 5.6 to 19 µg/L
- > 19 µg/L
- Sampled in Dry season (2023)
- Sampled in Wet season (2024)
- Road
- Drain
- Management area
- Marksmanship Training Range (MTR)
- PFAS Source areas
- Close Training Area
- Robertson Barracks

SOURCE
Locations, PFAS areas, Management area, MTR area and Site boundary (Indicative) from Tetra Tech Coffey
Roads, tracks, and drains from DoD.
Imagery from Nearmap (06-06-2023).

0 750 1,500 m

SCALE **1:45,000**
PAGE SIZE: **A3**
PROJECTION: **GDA 1994 MGA Zone 52**

DEPARTMENT OF DEFENCE

ROBERTSON BARRACKS ONGOING MONITORING REPORT (OCTOBER 2023 – MARCH 2024)

FIGURE 5B

Groundwater analytical results PFOA

TETRA TECH COFFEY

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714,000 714,500 715,000 715,500 716,000 716,500 717,000

8,625,500 8,625,000 8,624,500 8,624,000 8,623,500 8,623,000 8,622,500

SW091
SW123
Millners creek
SW059
SW028
SW023
SW086
SW007
Sourthern drainage channel
SW001
Millners creek
SW075

LEGEND

Sum of PFOS and PFHxS

- Below LOR
- LOR to 0.07 µg/L
- 0.07 to 0.7 µg/L
- 0.7 to 7 µg/L
- 7 to 70 µg/L
- >= 70 µg/L
- Sampled in Wet season (2024)
- Sampled in Dry season (2023)
- Road
- Drain
- Management area
- Marksmanship Training Range (MTR)
- PFAS Source areas
- Close Training Area
- Robertson Barracks

SOURCE
Locations, PFAS areas, Management area, MTR area and Site boundary (Indicative) from Tetra Tech Coffey
Roads, tracks, and drains from DoD.
Imagery from Nearmap (06-06-2023).

N

0 250 500 m

SCALE **1:12,000**
PAGE SIZE: **A3**
PROJECTION: **GDA 1994 MGA Zone 52**

DEPARTMENT OF DEFENCE

ROBERTSON BARRACKS ONGOING MONITORING REPORT (OCTOBER 2023 – MARCH 2024)

FIGURE 6A

Surface water analytical results PFOS+PFHxS

TETRA TECH COFFEY

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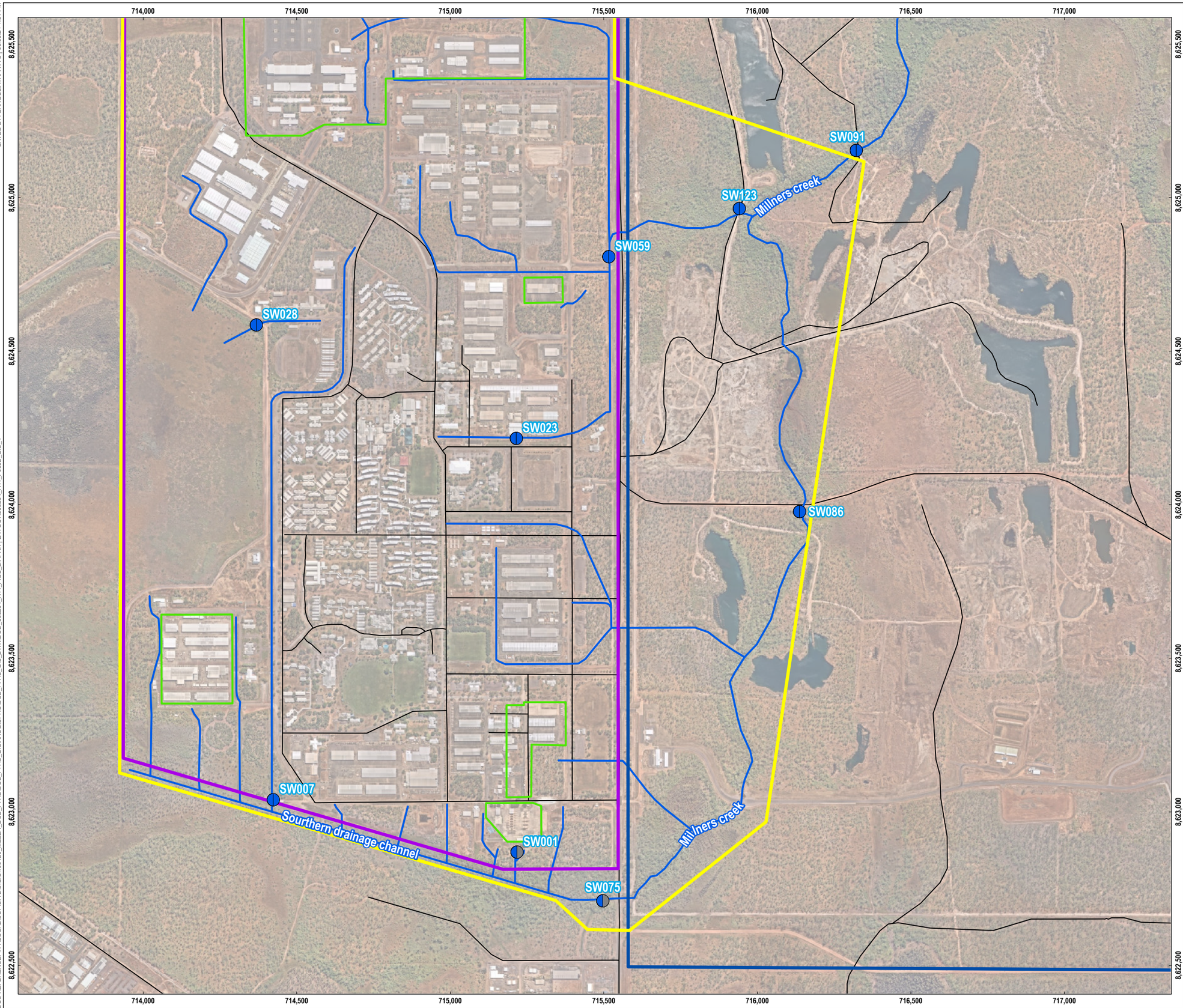

LEGEND

PFOA Concentration

- Below LOR
- LOR to 0.56 µg/L
- 0.56 to 5.6 µg/L
- 5.6 to 19 µg/L
- > 19 µg/L
- Sampled in Wet season (2024)
- Sampled in Dry season (2023)
- Road
- Drain
- Management area
- Marksmanship Training Range (MTR)
- PFAS Source areas
- Close Training Area
- Robertson Barracks

SOURCE
Locations, PFAS areas, Management area, MTR area and Site boundary (Indicative) from Tetra Tech Coffey
Roads, tracks, and drains from DoD.
Imagery from Nearmap (06-06-2023).

N

0 250 500 m

SCALE **1:12,000**
PAGE SIZE: **A3**
PROJECTION: **GDA 1994 MGA Zone 52**

DEPARTMENT OF DEFENCE

ROBERTSON BARRACKS ONGOING MONITORING REPORT (OCTOBER 2023 – MARCH 2024)

FIGURE 6B

Surface water analytical results PFOA

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APPENDIX B: SAQP AND FACTUAL REPORTS

Report 1 **Robertson Barracks, Wet Season Sampling Event Factual Report, 2024**

Report 2 **Robertson Barracks, Sampling Analysis & Quality Plan**

Report 3 **Robertson Barracks, Sampling Event Factual Report, Dry Season 2023**

Prepared for
Department of Defence Directorate
of PFAS Remediation Environment
and Engineering Branch
ABN: 68706814312

AECOM

Wet Season Sampling Event Factual Report, 2024

PFAS OMP - Robertson Barracks

03-Jul-2024
PFAS Ongoing Monitoring Plan

aecom.com

Delivering a better world

Wet Season Sampling Event Factual Report, 2024

PFAS OMP - Robertson Barracks

Client: Department of Defence Directorate of PFAS Remediation Environment and Engineering Branch

ABN: 68706814312

Prepared by

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03-Jul-2024

Job No.: 60612561

AECOM in Australia and New Zealand is certified to ISO9001, ISO14001 and ISO45001.

Quality Information

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Date	03-Jul-2024
Prepared by	[redacted]
Checker/s	[redacted]
Verifier/s	[redacted]

Revision History

Rev	Revision Date	Details	Approved	
			Name/Position	Signature
0	03-Jul-2024	Final	[redacted]	[redacted]

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Abbreviations

Term	Description
AECOM	AECOM Australia Pty Ltd
ALS	Australian Laboratory Services Environmental Pty Ltd
ANZG	Australian New Zealand Guidelines (for Fresh and Marine Water Quality)
ASC NEPM	National Environment Protection Council 1999, National Environment Protection (Assessment of Site Contamination) Measure
AS/NZS	Australia/New Zealand Standard®
DCMM	Defence Contamination Management Manual
Defence	Department of Defence
DO	Dissolved oxygen
DoH	Department of Health
DQO	Data quality objectives
DQI	Data quality indicators
EC	Electrical conductivity
HEPA	Heads of Environmental Protection Agencies
LOR	Limit of reporting
NATA	National Association of Testing Authorities
NEMP 2.0	National Environmental Management Plan
NHMRC	National Health and Medical Research Council
NMI	National Measurement Institute
NT	Northern Territory
NSW	New South Wales
OMP	Ongoing Monitoring Plan
ORP	Oxidation-reduction potential
PFAS	Per- and poly-fluoroalkyl substances
PFHxS	Perfluorohexane sulfonic acid
PFOA	Perfluorooctanoic acid
PFOS	Perfluorooctane sulfonate
PMAP	PFAS Management Area Plan
QA/QC	Quality Assurance/Quality Control
SBRS	Shoal Bay Receiving Station
SAQP	Sampling Analysis Quality Plan
SWL	Standing Water Level
TDS	Total dissolved solids

List of Units

Unit	Definition
°C	degrees Celsius
cm	centimetre
mm	millimetre
L	litre
m	metre
mAHD	metres Australian Height Datum
mbtoc	metres below top of casing
mg	milligrams
mV	millivolts
µg	micrograms
µS	microsiemens
NTU	Nephelometric Turbidity Unit

1.0 Introduction

1.1 General

AECOM Australia Pty Ltd (AECOM) was engaged by the Department of Defence (Defence) to implement the per- and poly-fluoroalkyl substances (PFAS) Ongoing Monitoring Plan (OMP) outlined in the *PFAS Management Area Plan (PMAP)* (Department of Defence, 2018) at Robertson Barracks (the 'Base') in the Northern Territory (NT). The location of the Base and Management Area is shown in **Figure 1** in **Appendix A**. The OMP (Department of Defence, 2023) for the Base outlines the requirement to complete groundwater and surface water sampling biannually.

The primary purpose of the OMP (Department of Defence, 2023) is to monitor changes to the PFAS impact in groundwater and surface water associated with sources of PFAS as initially assessed through the detailed site investigation phase of works. Changes may result from the specific or cumulative impact of remediation or containment actions, existing transportation trends, and changes to hydrogeology or weather events.

The monitoring plan at Robertson Barracks includes a regime of groundwater and surface water sampling to capture these changes in the long term, to enable Defence to maintain an up-to-date understanding of temporal and spatial distribution, concentration, and transport of PFAS contaminants.

This report details the scope and findings of 2023-2024 wet season monitoring activities, which were completed between November 2023 and March 2024.

1.2 Objectives

As noted above, the objective of the *PFAS OMP* (Department of Defence, 2023) is to provide information on changes to PFAS contamination originating from Defence property to inform risk management decisions by Defence to protect human health and the environment.

The purpose of this PFAS OMP factual report is to summarise the scope of works and findings for the November 2023 surface water and March 2024 groundwater and surface water sampling events, conducted in accordance with the Sampling and Analysis Quality Plan (SAQP) (AECOM, 2023).

This report has been prepared in accordance with the *Defence PFAS OMP Factual Reports Guidance,* Version 0.2, May 2021 (Department of Defence, 2021a). An ongoing monitoring report will be subsequently developed for the purpose of assessing the data collected during the discrete monitoring events completed over the preceding 12-month period (September 2023 through April 2024) and will include assessment of environmental variability and any statistically significant trends in PFAS concentrations.

2.0 Scope of work

The sampling event was completed in general accordance with the SAQP (AECOM, 2023). Prior to commencement of the sampling events, the SAQP (AECOM, 2023), was reviewed to ensure compliance with the following:

- The OMP (Department of Defence, 2023)
- Heads of the Environment Protection Authority (HEPA), PFAS National Environmental Management Plan (NEMP 2.0) (HEPA, 2020)
- National Environment Protection (Assessment of Site Contamination) Measure 1999 (ASC NEPM, 1999)
- Defence Routine Environment Water Quality Monitoring Manual (Department of Defence, 2019)
- AS/NZS 5667:1998 Water quality – Sampling (AS/NZS, 1998)
- Australian and New Zealand Guidelines for Fresh and Marine Water Quality (ANZG, 2018)

The scope of works completed for the wet season sampling events under the SAQP included:

- November and December 2023:
  - Collection of surface water samples from nine planned sampling locations (refer **Table 2** below, and **Figure 1** in **Appendix A,** for specific locations).
- March 2024:
  - Collection of groundwater samples (including gauging of groundwater levels) from 16 existing monitoring wells using Hydrasleeves™ and from two existing extraction bores by collecting grab samples from taps (refer to **Table 1** below, and **Figure 2** in **Appendix A**, for specific locations).
  - Collection of surface water samples from nine planned sampling locations (refer to **Table 2** below, and **Figure 1** in **Appendix A,** for specific locations).
- Collection of relevant quality assurance and quality control (QA/QC) samples in accordance with the relevant SAQP at the time of sampling.
- Analysis of all samples for a suite of 28 PFAS analytes at the standard limit of reporting (LOR).
- Data management of the OMP field and laboratory data in the Defence ESdat database.
- Preparation of this Sampling Event Factual Report.

2.1 Planned monitoring locations

The monitoring locations outlined within the relevant SAQP **(AECOM, 2023)** for the groundwater sampling and surface water events are tabulated below. Deviations from the planned sampling are highlighted in bold and detailed in Section 2.2 below.

Table 1 Groundwater sampling locations

Area	Description	Sampling Locations	Number of wells/ bores	Total
On-Base	North-eastern Boundary of Base	MW034	1	8
	Source Area 1	MW066	1	
	Source Area 2	MW004, MW004D	2	
	Up gradient Source Area 1	MW012, MW012D	2	

Area	Description	Sampling Locations	Number of wells/ bores	Total
	Up gradient Source Area 2	MW080	1	
	Cross-gradient of source areas 2 and 3	MW001	1	
Off-Base	Thorngate Road – Northern Boundary	MW032	1	10
	Down gradient Source 1	MW023	1	
	Across gradient Source 1	MW021, MW021D	2	
	Down gradient Source 2 and 3	MW018, MW031	2	
	Cross-gradient of Source Area 2 and 3	MW029, MW030	2	
	Shoal Bay Receiving Station (SBRS) – extraction bores	MW112^, MW113^	2	

^ Extraction bores, and therefore not able to collect gauging data.

Table 2 Surface water sampling locations

Area	Description	Sampling Locations	Number of Locations	Total
On-Base	On-base drainage line, Southeast boundary	SW001	1	5
	On-base drainage line, Southwest boundary	SW007	1	
	On-base drainage line, Central	SW023, SW028	2	
	On-base drainage line, Eastern boundary	SW059	1	
Off-Base	Northern Drainage Line	SW123	1	4
	Milner's Creek	SW086, SW091	2	
	Southern Drainage Channel	SW075	1	

2.2 Deviations from the SAQP

The works completed during this sampling event included deviations from the SAQP (AECOM, 2023) as outlined below in Table 3 below.

Table 3 Deviations from the SAQP

SAQP	Deviation	Impact to OMP
Collection of field parameters and observations at each sample location.	The water quality monitor utilised on 1 March 2024 during the end of wet season surface water sampling event malfunctioned during fieldworks and dissolved oxygen (DO) readings were not taken at	No material impact to the dataset. DO readings for this day were removed from the dataset.

SAQP	Deviation	Impact to OMP
	SW086, SW091, SW123, MW018, MW021, MW021D and MW023.	
Collection of field parameters and observations at each sample location.	Electrical conductivity readings for the groundwater samples were not accurate due to faulty equipment.	No material impact to the dataset. Historical end of wet season field parameters is reliable.
Collection of gauging data within the 24-hour methodology period	MW001 was not gauged within the 24-hour gauging period with the other wells.	Minimal impact, nearby well (MW030) recorded approximately a 10 cm difference between the gauging and sampling event which will not materially impact groundwater contours as displayed in **Appendix A Figure 3**.
No analysis completed for SW001 and SW075	Locations were visited and sampled, however, the laboratory did not analyse the samples and disposed of them prior to analysis.	Moderate impact, resulting from a loss of late wet season surface water PFAS data for these locations. However, results both upgradient and downgradient of these locations have shown non-detects for the March 2024 sampling round.

3.0 Sampling methodology

The methodology adopted for the sampling events in November 2023 and March 2024 was in accordance with the SAQP (AECOM, 2023) and is summarised **Table 4** below.

Table 4 Sampling methodology

Item	Details
Groundwater and surface water sampling methodology	
Groundwater gauging	Where accessible, the depth to groundwater was measured in each monitoring well within a 24-hour period, and then again immediately prior to collection of groundwater samples using an interface probe.
Field parameters	Where appropriate, groundwater and surface water field parameters were recorded ex-situ using a YSI Pro Water Quality Meter. Parameters recorded consisted of the following: temperature (°C), electrical conductivity (EC), dissolved oxygen (DO), oxidation-reduction potential (ORP) and pH, these results are presented in **Appendix B**, **Table 1** and **Table 3**. Observations of odour, colour and clarity (turbidity) of groundwater and surface water was recorded at each site. Further, surface water location flow observations were recorded. Refer to **Appendix C** for the calibration certificates for the YSI Pro Water Quality Meter.
Water sampling methodology	Groundwater samples were collected from all accessible wells using no-purge methodology HydraSleeves™, which were installed within the screened interval of the wells for a minimum of 24 hours prior to sampling. HydraSleeve™ placement was based on a review of the well construction logs. Once sampling was completed, new HydraSleeves™ were redeployed within the screened interval in preparation for the next sampling round. Two extraction bores, MW112 and MW113, were sampled by grab sample from the headwork's tap. Surface water samples were collected from either mid-way through the water column or approximately 0.5 m below the surface (if possible) with care taken to minimise collection of sediment or floating materials in the samples. At each location, laboratory supplied bottles were lowered into the water using an aluminium sampling pole, with the cap immediately applied once the container was full and retrieved from the water.
Quality Assurance/ Quality Control (QA/QC) samples	For water sampling, field QA/QC samples included intra-laboratory duplicate and inter-laboratory duplicate samples collected at a rate of 1 in 10 primary samples, rinsate samples collected at a rate of one per day where decontaminated non-dedicated equipment was used, field blank samples at a rate of one per sampling day and trip blank samples at a rate of one per cooler. Refer to **Appendix D** for the data validation assessment of QA/QC sample data.
Sample analysis	In accordance with meeting the Data Quality Objectives (DQO) outlined in the OMP (AECOM, 2023), samples collected were tested for the extended PFAS suite at National Association of Testing Authorities' (NATA) accredited laboratories. Primary and intra-laboratory duplicate samples were submitted to the primary laboratory, Australian Laboratory Services Environmental (ALS) Sydney, New South Wales (NSW). Inter-laboratory samples were sent to secondary laboratory, National Measurement Institute (NMI) Sydney, NSW. Chain of custody and laboratory certificates are presented in **Appendix E** and **Appendix F** respectively.

3.1 Adopted screening criteria

Screening criteria were selected on the basis of national guidance in the form of the PFAS National Environmental Management Plan, Defence estate and environmental strategies, and Defence PFAS-specific strategies and guidance. Guidance documents used to assess the dataset includes the following:

- Department of Health (DoH) Health Based Guidance Values for PFAS for use in site investigations in Australia (Department of Health, 2019)
- Heads of the Environment Protection Authority (HEPA), PFAS National Environmental Management Plan (PFAS NEMP 2.0) (HEPA, 2020)
- National Health and Medical Research Council (NHMRC), Guidance on PFAS in Recreational Water (NHMRC, 2019)
- National Environment Protection (Assessment of Site Contamination) Measure 1999, Schedule B1, (ASC NEPM, 1999).

The adopted screening criteria which have been adopted for groundwater are presented **Table 5**.

Table 5 Summary of adopted screening criteria for groundwater and surface water

Pathway	Compound	Criteria	Comment/Reference
Human health receptors			
Drinking water - groundwater	Perfluorooctane sulfonate (PFOS) + Perfluorohexane sulfonic acid (PFHxS)	0.07 µg/L	These values are from the PFAS NEMP 2.0 (HEPA, 2020). *All groundwater results will be compared to these criteria.*
	Perfluorooctanoic acid (PFOA)	0.56 µg/L	
Recreational use – surface water	PFOS + PFHxS	2 µg/L	These values are from Guidance on PFAS NEMP (HEPA, 2020). *All surface water results will be compared to these criteria.*
	PFOA	10 µg/L	
Ecological receptors			
Freshwater 99% species protection – Groundwater and Surface Water	PFOS	0.00023 µg/L	These values are from the PFAS NEMP 2.0 (HEPA, 2020). The 99% level of protection has been applied for slightly to moderately disturbed ecosystems. This approach is generally adopted for chemicals that bioaccumulate and biomagnify in wildlife. For the purposes of preliminary screening of analytical water results, the laboratory LOR will be adopted rather than sole use of the criteria value. *All surface water and groundwater results will be compared to these criteria.*
	PFOA	19 µg/L	

3.2 Data quality objectives and data validation

The DQOs and data quality indicators (DQIs) adopted for these works are presented in the SAQP (AECOM, 2023).

Data validation assessment is provided in **Appendix D**.

Key findings from the data validation were as follows:

- Data validation procedures employed in the assessment of the field and laboratory QA/QC data are indicative that the overall quality of the analytical data produced is acceptably reliable for the purpose of this report. The data validation findings did not flag potential material inaccuracies with any analytical results.
- All data collected during this event has been reviewed and uploaded to the Defence ESdat database in accordance with Defence Contamination Management Manual (DCMM) Annex L, August 2021 (Department of Defence, 2021b) requirements.

4.0 Field observations and results

4.1 General field observations

The following field observations were applicable across the entirety of the November and December 2023 and March 2024 sampling events. Field observations and results are presented in **Appendix B Table 1** and **Table 3** and **Appendix G** sampling logs.

Table 6 General field observations

Item	Observation
Weather conditions (November – December 2023)	Weather in general was observed to be hot, humid and rainy. Rainfall was recorded at the nearest rain gauging station (Knuckey Lagoon) on the sampling field dates of 28 November - 12 December 2023 with 76.8 mm of rain recorded across the sampling days (Knuckey Lagoon weather station, 014988).
Weather conditions (March 2024)	Weather in general was observed to be hot, humid and rainy. Rainfall was recorded at the nearest rain gauging station (Knuckey Lagoon) on the sampling field dates of 1 to 12 March 2024 with 262.4 mm of rain recorded across the sampling days. A total of 1451.4 mm was recorded between 1 December 2023 and 12 March 2024 (Knuckey Lagoon weather station, 014988).
Estate Management Works or Training Activities	During the sampling event, no notable estate works, or training activities were observed in the vicinity of sampling locations. Base activities are not expected to have a material impact on sampling results.

4.2 Surface water

4.2.1 Field observations and field measurements

Field data was collected on data forms and the data was uploaded into ESdat for development of report tables. Field data tables are presented in **Appendix B – Table 1.**

Table 7 Surface water field observations and measurements for November to December 2023 and March 2024 events

Item	Observations and field measurements
Fieldwork Dates	The start of wet season surface water sampling event was completed on 28 November and 15 December 2023. The end of wet season surface water sampling event was completed between 1 and 8 March 2024.
Access and Sample Collection	Nine surface water monitoring locations were accessible and sampled for both events.
Contamination Observations	**Start of wet season sampling event (28 November & 15 December 2023):** • SW007 reported observations of an organic sheen and odour and moderate turbidity. **End of wet season sampling event (1 to 8 March 2024):** • SW001 and SW086 both reported observations of moderate turbidity.
Surface Water Flow	**Start of wet season sampling event (28 November & 15 December 2023):** • SW086 and SW059 reported no surface water flow (pooled) • SW001, SW007, SW023, SW028 and SW075 had low observed surface water flows

Item	Observations and field measurements
	• MW123 and SW091 had moderate observed surface water flows. **End of wet season sampling event (1 to 8 March 2024):** • SW001, SW007, SW023, SW028, SW059, SW075 and SW086 had low observed surface water flows • SW091 and SW123 had moderate observed surface water flows.
Geochemical Parameters	Surface water geochemical parameters were measured prior to collecting surface water samples in November 2023. The stabilised readings are presented in **Table B3** in **Appendix B**, and are summarised below: **Start of wet season sampling event (28 November & 15 December 2023):** • Dissolved oxygen ranged from 1.48 milligrams per litre (mg/L) (SW086) to 5.35 mg/L (SW023) indicating hypoxic to oxygenated conditions • Electrical conductivity ranged from 33.4 micro siemens per centimetre (µS/cm) (SW028) to 80 µS/cm (SW007) indicating freshwater conditions • pH ranged from 5.04 (SW086) to 8.34 (SW023) pH units indicating slightly acidic to slightly alkaline conditions • Corrected redox ranged from -4.4 millivolts (mV) (SW059) to 315.0 mV (SW086) indicating reducing to oxidising conditions **End of wet season sampling event (1 to 8 March 2024):** • Dissolved oxygen ranged from 2.54 mg/L (SW007) to 5.22 mg/L (SW023) indicating slightly hypoxic to oxygenated conditions • Electrical conductivity ranged from 14.4 µS/cm (SW028) to 61.7 µS/cm (SW086) indicating freshwater conditions • pH ranged from 5.52 (SW007) to 7.04 (SW023) pH units indicating slightly acidic to neutral conditions • Corrected redox ranged from 224.2 mV (SW075) to 293.9 mV (SW091) indicating oxidising conditions

4.2.2 PFAS Surface water analytical results

The PFAS surface water analytical results from the November to December 2023 sampling event are presented in **Appendix B, Table 2**.

During the November to December 2023 ‘start of wet season’ sampling event five of the nine surface water locations (SW001, SW059, SW075, SW091 and SW123) reported concentrations of Sum of PFOS + PFHxS above the laboratory LOR and below the recreational guideline (HEPA, 2020). The same five locations reported PFOS concentrations above the laboratory LOR and adopted freshwater 99% species protection guideline (HEPA, 2020).The potential exists for PFOS concentrations to be above the adopted freshwater 99% species protection guideline (HEPA, 2020) but below the laboratory LOR for samples SW007, SW023, SW028 and SW086.

All samples reported concentrations of PFOA below the laboratory LOR and the adopted human health and ecological guidelines (HEPA, 2020).

There were no first-time detections of PFOS + PFHxS, PFOS or PFOA at any of the surface water monitoring locations. There were no new exceedances above the screening criteria in the dataset.

The PFAS surface water analytical results from the March 2024 sampling event are presented in **Appendix B, Table 2** and spatially on **Figure 2** in **Appendix A**.

During the March 2024 ‘end of wet season’ sampling event, three of the seven surface water samples analysed (SW059, SW091 and SW123) reported concentrations of Sum of PFOS + PFHxS above the laboratory LOR and below the recreational guideline (HEPA, 2020). The same three locations reported PFOS concentrations above the laboratory LOR and adopted freshwater 99% species protection guideline (HEPA, 2020).The potential exists for PFOS concentrations to be above the adopted freshwater 99% species protection guideline (HEPA, 2020) but below the laboratory LOR for samples SW007, SW023, SW028 and SW086.

All samples reported concentrations of PFOA below the laboratory LOR and the adopted human health and ecological guidelines (HEPA, 2020).

There were no first-time detections of PFOS + PFHxS, PFOS or PFOA at any of the surface water monitoring locations. There were no new exceedances above the screening criteria in the dataset.

4.3 Groundwater

4.3.1 Field observations and field measurements

Field data was collected on data forms and the data was uploaded into ESdat for development of report tables. Field data tables are presented in **Appendix B – Table T3.**

Table 8 Groundwater observations and field measurements

Item	Observations and field measurements
Fieldwork Dates	The groundwater sampling event was completed between 1 and 12 March 2024.
Access and Sample Collection	18 monitoring wells and bores were accessible and sampled. Monitoring locations MW112 and MW113 are extraction bores and samples were collected from the fitted taps. No standing water levels (SWL) were recorded at these locations.
Monitoring Well Network Condition	The monitoring well network was generally in good condition.
Field Observations	Moderate turbidity was observed in sampled collected from monitoring locations, MW001, MW018, MW029 and MW030.
Depth to Groundwater and flow direction	Groundwater levels were recorded from 16 of 16 wells visited (monitoring locations MW112 and MW113 are production bores and not able to be gauged). Recorded depth to groundwater ranged from 0.746 (MW030) to 5.925 (MW023) metres below top of casing (mbtoc). Groundwater elevations in the Upper Bathurst Island Formation aquifer were calculated to be between 16.03 and 27.64 metres Australian Height Datum (mAHD). Groundwater gauging data is presented in **Appendix B – Table 3**. Inferred groundwater contours and groundwater flow directions at the site in March 2024 are shown in **Appendix A - Figure 3**. Inferred groundwater contouring suggests that groundwater in the shallow aquifer unit drains east and northeast towards Millner's Creek.
Water Quality Parameters	Groundwater geochemical parameters were measured during sample collection from the HydraSleeve™ (or from the grab samples obtained from the taps) using a decontaminated YSI cup and YSI Pro Water Quality Meter. The reduced electrical conductivity range is suspected to have been caused by faulty equipment. The readings are presented in **Appendix B - Table 3** and are summarised below: • Dissolved oxygen ranged from 0.72 mg/L (MW031) to 5.22 mg/L (MW034 & MW112) indicating hypoxic to oxygenated conditions (noting no DO results recorded for four wells) • Electrical conductivity ranged from 0.6 µS/cm (MW112) to 392.3 µS/cm (MW113) indicating freshwater conditions. • pH ranged from 4.89 (MW030) to 6.95 (MW018 & MW113) pH units indicating slightly acidic to neutral conditions • Corrected redox ranged from 204.3 mV (MW004D) to 465.7 mV (MW112) indicating oxidising conditions.

4.3.2 PFAS groundwater analytical results

The PFAS groundwater analytical results from the March 2024 sampling event are presented in **Appendix B – Table 4**.

During this sampling event, three of the 18 groundwater locations (MW021D, MW032, MW080) reported Sum of PFOS + PFHxS concentrations above the laboratory LOR but below the adopted drinking water guideline (HEPA, 2020). Five of the 18 locations (MW001, MW004, MW030, MW034, MW066) reported of PFOS + PFHxS concentrations above the adopted drinking water guideline (HEPA, 2020). The same eight locations reported PFOS concentrations above the laboratory LOR and adopted freshwater 99% species protection guideline (HEPA, 2020). The potential exists for PFOS concentrations to be above the adopted freshwater 99% species protection guideline (HEPA, 2020) but below the laboratory LOR for samples MW004D, MW012, MW012D, MW018, MW021, MW023, MW029, MW031, MW112 and MW113.

MW066 reported PFOA concentrations above the laboratory LOR but below the adopted human health and ecological guidelines (HEPA, 2020).

There were no first-time detections or new exceedances at any groundwater monitoring locations.

5.0 Summary and next sampling events

5.1 Summary of monitoring event

The wet season monitoring events were completed at the Base and publicly accessible land within the Management Area during two separate sampling events, at the start of the wet season 28 November to 15 December 2023 and during the end of the wet season, 1 to 12 March 2024. The program included the following:

- Surface water sampling of nine planned sampling locations in November and December 2023
- Groundwater sampling of 18 planned monitoring wells in March 2024
- Surface water sampling from nine planned sampling locations in March 2024.

The findings of the November 2023 and March 2024 sampling events and the recommended actions are summarised in **Table 9** below.

Table 9 Summary of Sampling Event

Item	Comment	Recommended Actions
Access to sampling locations	All sampling locations were accessible.	Continue to monitor under the OMP.
Monitoring well network condition	All monitoring wells were able to be sampled.	Continue to monitor under the OMP.
Analytical Results	PFAS concentrations were recorded above the LOR at eight of 18 groundwater monitoring well locations sampled. PFAS concentrations were recorded above the LOR at five surface water locations during the start of wet season sampling event, and at three locations at the end of wet season sampling event. It should be noted that two locations, SW001 and SW075, were sampled during the end of wet season sampling event but not analysed by the laboratory and were subsequently disposed of by the lab prior to receiving instruction to conduct analysis. The resulting loss of late wet season surface water PFAS data for these locations has a moderate impact on the dataset. Results from the upgradient and downgradient sampling locations in the March 2024 sampling event reported as non-detect, indicating that the risks associated to PFAS in surface water in this area remain low.	Continue to monitor under the OMP.
New exceedance of NEMP 2.0 drinking water and ecological guideline values in	None.	Continue to monitor under the OMP.

Item	Comment	Recommended Actions
groundwater or surface water		
First-time detection of PFAS in groundwater or surface water	None.	Continue to monitor under the OMP.

5.2 Upcoming sampling events

The next sampling event is scheduled for September/October 2024 for the end of dry season groundwater event.

5.3 Upcoming ongoing monitoring report

An ongoing monitoring report is scheduled to be delivered in the third quarter of 2024, covering the period from September 2023 to March 2024.

6.0 References

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Department of Health, 2019. *Health based guidance values for PFAS for use in site investigations in Australia 2017 (as amended 2019),* s.l.: s.n.

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NHMRC, 2019. *Guidance on Per and Polyfluoroalkyl (PFAS) in Recreational Water,* s.l.: National Health and Medical Research Council.

Appendix A

Figures

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N

DATUM GDA 1994, PROJECTION MGA ZONE 52

0 100 200 400 600 800
metres

1:13,000 (when printed at A3)

LEGEND

- Surface Water Locations
- Management Area
- Source Area

Site Layout

- Robertson Barracks
- Close Training Area
- Marksmanship Training Range
- Watercourse
- Highway
- Road
- Track

Note:
SW001 and SW075 were sampled but not analysed by the laboratory due to electronic COC error.

Data sources:
Base data NT Gov 2019
GW data AECOM 2019

Department of Defence
ROBERTSON BARRACKS
PFAS ONGOING MONITORING PROGRAM
WET SEASON SAMPLING EVENT FACTUAL REPORT 2024

Surface Water Sampling Locations

PROJECT ID	60612561
CREATED BY	[redacted]
LAST MODIFIED	GAOB - 29 MAY 2024
VERSION:	1

Figure
1

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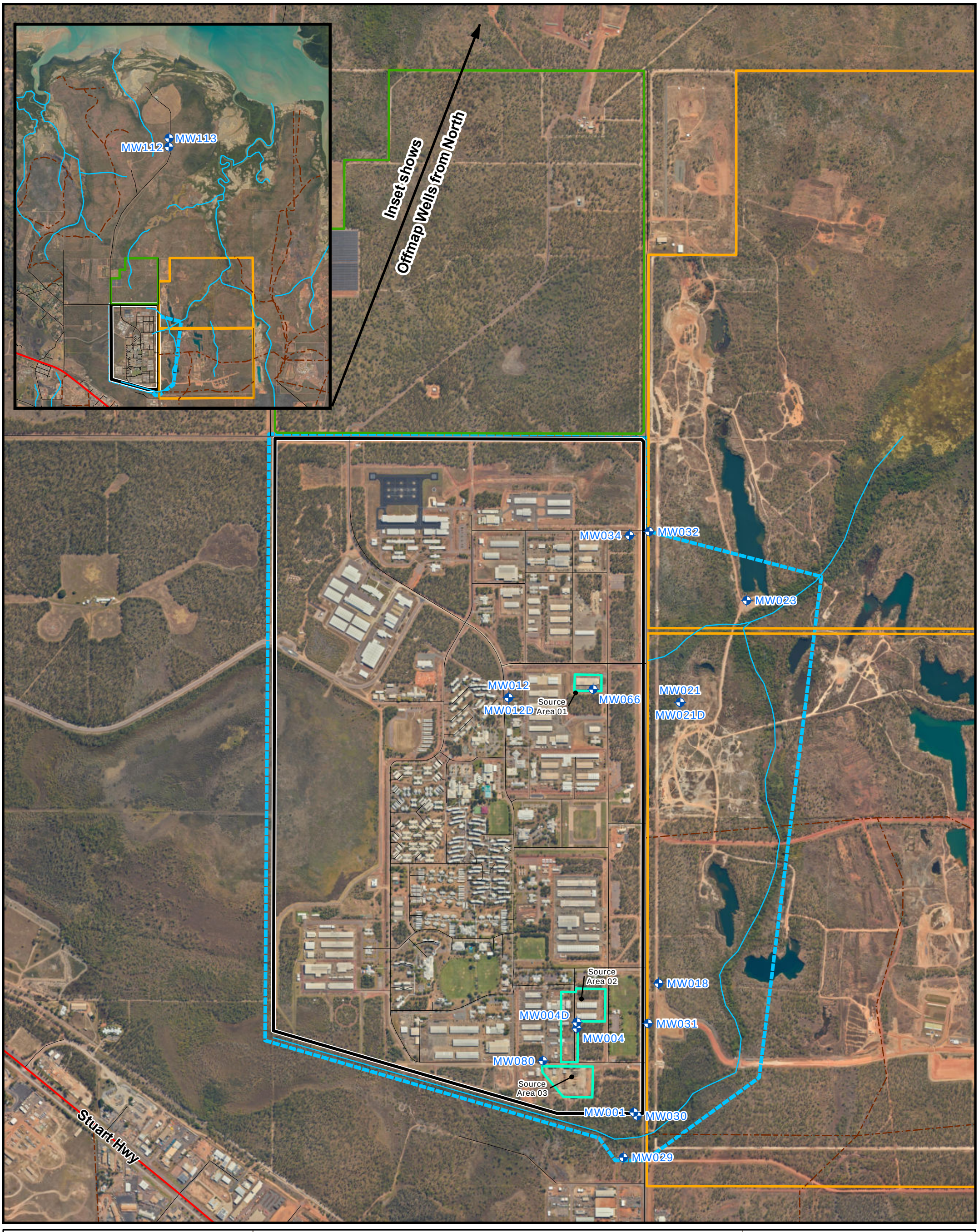
A3 size



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DATUM GDA 1994, PROJECTION MGA ZONE 52

0 100 200 400 600 800

metres

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LEGEND

- Groundwater Monitoring Locations
- Management Area
- Source Area
- **Site Layout**
  - Robertson Barracks
  - Close Training Area
  - Marksmanship Training Range
- Watercourse
- Highway
- Road
- Track

Data sources:
Base data NT Gov 2022
GW data AECOM 2022

Department of Defence
ROBERTSON BARRACKS
PFAS ONGOING MONITORING PROGRAM
WET SEASON SAMPLING EVENT FACTUAL REPORT 2024

Groundwater Sampling Locations

PROJECT ID	60612561
CREATED BY	[redacted]
LAST MODIFIED	GAOB - 29 MAY 2024
VERSION:	1

Figure
2

Filename: \\na.aecomnet.com\LFS\APAC\Darwin-AUDWN1\Legacy\Projects\606x\60612561\900_CAD_GIS\920_GIS\60612561_Darwin_Def\02_MXDs\RobertsonBarracks\05_2024_WSSE_FR\G60612561_RB_03_2023_WSSE_FR.aprx Layout: 60612561_03_002

A3 size

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DATUM GDA 1994, PROJECTION MGA ZONE 52

0 50 100 200 300 400
metres

1:10,000 (when printed at A3)

LEGEND

- Groundwater Monitoring Locations
- 75.44 Inferred Groundwater Level (mAHD)
- Inferred Groundwater Level
- Inferred Flow Direction
- Management Area
- Source Area

Site Layout

- Robertson Barracks
- Close Training Area
- Marksmanship Training Range
- Watercourse
- Road
- Track

Note:
- MW001, MW004D, MW012D, MW021D, MW029, MW030, MW032, MW034 not included in contouring.
- Millner Creek to the south of the Base influences nearby groundwater flow direction, however overall groundwater flow direction is to the north-east.

Data sources:
Base data NT Gov 2022
GW data AECOM 2022

Department of Defence
ROBERTSON BARRACKS
PFAS ONGOING MONITORING PROGRAM
WET SEASON SAMPLING EVENT FACTUAL REPORT 2024

Groundwater Contours

PROJECT ID	60612561
CREATED BY	[redacted]
LAST MODIFIED	GAOB - 29 MAY 2024
VERSION:	1

Figure
3

A3 size

Filename: \\na.aecomnet.com\LFS\APAC\Darwin-AUDWN1\Legacy\Projects\606x\60612561\900_CAD_GIS\920_GIS\60612561_Darwin_Def\02_MXDs\RobertsonBarracks\05_2024_WSSE_FR\G60612561_RB_03_2023_WSSE_FR.aprx Layout: 60612561_03_003

Appendix B

Tables

Appendix B- Table 1
Surface Water Field Results
PFAS Ongoing Monitoring Plan
Department of Defence - Robertson Barracks

Table 1 - Surface Water Field Results

AECOM

	Field Parameters													
Location ID	**Date**	**DO (mg/L)**	**EC (µS/cm)**	**TDS (calc) (mg/L)**	**pH**	**Redox (mV)**	**Redox (corr)(mV)**	**Temp (°C)**	**Turbidity (Visual)**	**Water Colour**	**Odour**	**Sheen**	**Flow**	**Sample Method**
SW001	15/12/2023	4.44	66.6	40.0	7.3	93.6	293.6	29.0	Low	Pale brown	Odourless	No sheen	Low	Grab
SW007	15/12/2023	3.77	80.0	48.0	6.9	100.3	300.3	28.2	Low	Colourless	Odourless	No sheen	Low	Grab
SW023	14/12/2023	5.35	52.0	31.2	8.3	78.6	278.6	28.1	Low	Colourless	Odourless	No sheen	Low	Grab
SW028	14/12/2023	5.09	33.4	20.0	8.1	77.5	277.5	27.6	Low	Colourless	Odourless	No sheen	Low	Grab
SW059	11/12/2023	5.00	59.8	35.9	6.9	103.0	303.0	28.3	Low	Colourless	Odourless	No sheen	Pooled	Grab
SW075	14/12/2023	4.09	48.5	29.1	6.8	-204.4	-4.4	31.8	Low	Colourless	Odourless	No sheen	Low	Grab
SW086	28/11/2023	1.48	47.6	28.6	5.0	115.0	315.0	29.8	Low	Pale brown	Odourless	No sheen	Pooled	Grab
SW091	28/11/2023	1.79	36.1	21.7	5.2	96.2	296.2	29.1	Moderate	Pale yellow	Organic odour	Organic sheen	Moderate	Grab
SW123	28/11/2023	2.27	55.5	33.3	6.1	94.8	294.8	28.8	Low	Colourless	Odourless	No sheen	Moderate	Grab
SW001	6/03/2024	4.01	36.8	22.1	5.6	32.2	232.2	28.6	Moderate	Pale brown	Odourless	No sheen	Low	Grab
SW007	5/03/2024	2.54	21.0	12.6	5.5	73.2	273.2	29.5	Low	Colourless	Odourless	No sheen	Low	Grab
SW023	5/03/2024	5.22	30.1	18.1	7.0	81.7	281.7	30.5	Low	Colourless	Odourless	No sheen	Low	Grab
SW028	5/03/2024	3.40	14.4	8.6	6.5	73.0	273.0	35.3	Low	Colourless	Odourless	No sheen	Low	Grab
SW059	7/03/2024	3.68	20.4	12.2	5.9	33.4	233.4	27.6	Low	Colourless	Odourless	No sheen	Low	Grab
SW075	8/03/2024	4.13	20.2	12.1	5.7	24.2	224.2	29.5	Low	Colourless	Odourless	No sheen	Low	Grab
SW086	1/03/2024	-	61.7	37.0	7.0	90.8	290.8	30.3	Moderate	Brown	Odourless	No sheen	Low	Grab
SW091	1/03/2024	-	27.3	16.4	6.8	93.9	293.9	32.3	Low	Colourless	Odourless	No sheen	Moderate	Grab
SW123	1/03/2024	-	32.8	19.7	6.3	76.1	276.1	31.7	Low	Colourless	Odourless	No sheen	Moderate	Grab

Notes:
mg/L: milligram per Litre
µS/cm: microsiemens per centimetre
mV: millivolts
°C: degrees celcius
DO Values not presented due to YSI malfunction for SW086, SW091 and SW123

Appendix B- Table 2
Surface Water Analytical Results
PFAS Ongoing Monitoring Plan
Department of Defence-Roberston Barracks

Table 2 - Surface Water Analytical Results

						PFAS Full Suite																													
						10:2 Fluorotelomer sulfonic acid (10:2 FTS)	4:2 Fluorotelomer sulfonic acid (4:2 FTS)	6:2 Fluorotelomer Sulfonate (6:2 FtS)	8:2 Fluorotelomer sulfonic acid (8:2 FTS)	N-Ethyl perfluorooctane sulfonamide (EtFOSA)	N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	N-Methyl perfluorooctane sulfonamide (MeFOSA)	N-Methyl perfluorooctane sulfonamidoacetic acid (MFOSAA)	N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	Perfluorobutane sulfonic acid (PFBS)	Perfluorobutanoic acid (PFBA)	Perfluorodecanesulfonic acid (PFDS)	Perfluorodecanoic acid (PFDA)	Perfluorododecanoic acid (PFDoDA)	Perfluoroheptane sulfonic acid (PFHpS)	Perfluoroheptanoic acid (PFHpA)	Perfluorohexanoic acid (PFHxA)	Perfluorononanoic acid (PFNA)	Perfluorooctane sulfonamide (FOSA)	Perfluoropentane sulfonic acid (PFPeS)	Perfluoropentanoic acid (PFPeA)	Perfluorotetradecanoic acid (PFTeDA)	Perfluorotridecanoic acid (PFTrDA)	Perfluoroundecanoic acid (PFUnDA)	Sum of PFAS	Sum of PFHxS and PFOS	Perfluorooctane sulfonic acid (PFOS)	Perfluorooctanoic Acid (PFOA)	Perfluorohexane sulfonic acid (PFHxS)
						µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
LOR						0.05	0.05	0.05	0.05	0.05	0.02	0.05	0.05	0.02	0.05	0.02	0.1	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.05	0.02	0.02	0.01	0.01	0.01	0.01	0.01
PFAS NEMP 2020 Freshwater 99%																																	*0.00023**	*19*	
PFAS NEMP 2020 Recreational Water																																2		10	
	Location Code	**Sampled Date**	**Field ID**	**Lab Report Number**	**Sample Type**																														
November & December 2023 - Start of Wet Season	SW001	15/12/2023	1200_SW001_231012	ES2343723	Normal	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	0.01	0.01	*0.01*	<0.01	<0.01
	SW007	15/12/2023	1200_SW007_231215	ES2343723	Normal	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	<0.01	<0.01	*<0.01**	<0.01	<0.01
	SW023	15/12/2023	1200_SW023_231215	ES2343723	Normal	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	<0.01	<0.01	*<0.01**	<0.01	<0.01
	SW028	15/12/2023	1200_SW028_231215	ES2343723	Normal	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	<0.01	<0.01	*<0.01**	<0.01	<0.01
	SW059	15/12/2023	1200_SW059_231215	ES2343723	Normal	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	0.06	0.06	*0.06*	<0.01	<0.01
	SW075	15/12/2023	1200_SW075_231215	ES2343723	Normal	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	0.1	0.1	*0.07*	<0.01	0.03
	SW086	28/11/2023	1200_SW086_231128	ES2341145	Normal	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	<0.01	<0.01	*<0.01**	<0.01	<0.01
	SW091	28/11/2023	1200_SW091_231128	ES2341145	Normal	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	0.05	0.05	*0.03*	<0.01	0.02
	SW123	28/11/2023	1200_SW123_231128	ES2341145	Normal	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	0.18	0.18	*0.11*	<0.01	0.07
March 2024 - End of Wet Season	SW007	6/03/2024	1200_SW007_240306	ES2408291	Normal	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	<0.01	<0.01	*<0.01**	<0.01	<0.01
	SW023	5/03/2024	1200_SW023_240305	ES2408291	Normal	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	<0.01	<0.01	*<0.01**	<0.01	<0.01
	SW028	5/03/2024	1200_SW028_240305	ES2408291	Normal	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	<0.01	<0.01	*<0.01**	<0.01	<0.01
	SW059	7/03/2024	1200_SW059_240307	ES2408291	Normal	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	0.21	0.19	*0.14*	<0.01	0.05
	SW086	1/03/2024	1200_SW086_240301	ES2408291	Normal	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	<0.01	<0.01	*<0.01**	<0.01	<0.01
	SW091	1/03/2024	1200_SW091_240301	ES2408291	Normal	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	0.01	0.01	*0.01*	<0.01	<0.01
	SW123	1/03/2024	1200_SW123_240301	ES2408291	Normal	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	0.16	0.16	*0.12*	<0.01	0.04

Notes:
µg/L: micrograms per litre
LOR: limit of reporting
* LOR is above guideline value
Denotes first time detection above LOR for Sum of PFHxS+PFOS or PFOA
Denotes new exceedance of human health screening criteria

Appendix B- Table 3
Groundwater Field Results
PFAS Ongoing Monitoring Plan
Department of Defence - Robertson Barracks

Table 3 - Groundwater Field Results

AECOM

	Gauging Results						Field Parameters											
Location ID	**Date**	**Depth to Water (mbTOC)**	**Well Depth (mbTOC)**	**TOC (mAHD)**	**Water Elevation (mAHD)**	**Condition of Gatic**	**Date**	**DO (mg/L)**	**EC (µS/cm)**	**TDS (calc) (mg/L)**	**pH**	**Redox (mV)**	**Redox (corr)(mV)**	**Temp (°C)**	**Turbidity (Visual)**	**Water Colour**	**Odour**	**Sheen**	**Sample Method**
MW001	6/03/2024	1.149	7.84	24.37	23.22	Good	6/03/2024	0.82	53.2	31.9	5.1	94.6	294.6	27.1	Moderate	Pale brown	Odourless	No sheen	Hydrasleeve
MW004	29/02/2024	2.838	8.11	-	-	Good	5/03/2024	1.23	73.0	43.8	5.2	98.2	298.2	33.9	Low	Colourless	Odourless	No sheen	Hydrasleeve
MW004D	29/02/2024	2.755	29.81	26.78	24.03	Good	5/03/2024	1.91	335.8	201.5	6.7	4.3	204.3	32.9	Low	Colourless	Odourless	No sheen	Hydrasleeve
MW012	29/02/2024	3.012	23.55	30.65	27.64	Good	12/03/2024	4.22	123.5	74.1	6.9	102.1	302.1	30.3	Low	Colourless	Odourless	No sheen	Hydrasleeve
MW012D	29/02/2024	4.612	NM	30.77	26.16	Good	12/03/2024	4.18	132.0	79.2	6.9	131.2	331.2	30.4	Low	Light brown	Odourless	No sheen	Hydrasleeve
MW018	1/03/2024	2.400	8.72	25.57	23.17	Good	1/03/2024	-	61.7	37.0	7.0	9.8	209.8	30.3	Moderate	Brown	Odourless	No sheen	Hydrasleeve
MW021	1/03/2024	2.331	8.73	18.03	18.03	Good	1/03/2024	-	35.8	21.5	6.4	116.1	316.1	30.3	Low	Light brown	Odourless	No sheen	Hydrasleeve
MW021D	1/03/2024	1.907	30.61	17.99	16.08	Good	1/03/2024	-	129.1	77.5	6.5	76.1	276.1	31.7	Low	Colourless	Odourless	No sheen	Hydrasleeve
MW023	1/03/2024	5.925	8.55	-	-	Good	1/03/2024	-	94.9	56.9	6.3	120.0	320.0	31.8	Low	Brown	Odourless	No sheen	Hydrasleeve
MW029	29/03/2024	1.677	7.54	25.436	23.76	Good	8/03/2024	3.59	37.9	22.7	5.3	71.8	271.8	30.9	Moderate	Brown	Odourless	No sheen	Hydrasleeve
MW030	29/03/2024	0.746	7.03	23.33	22.58	Good	8/03/2024	2.95	31.3	18.8	4.9	59.7	259.7	29.6	Moderate	Brown	Odourless	No sheen	Hydrasleeve
MW031	29/03/2024	2.152	7.67	25.558	23.41	Good	8/03/2024	0.72	45.0	27.0	5.1	75.4	275.4	31.1	Low	Pale brown	Odourless	Organic	Hydrasleeve
MW032	29/03/2024	2.011	8.66	19.862	17.85	Good	8/03/2024	1.72	41.1	24.7	5.4	69.8	269.8	31.5	Low	Colourless	Odourless	No sheen	Hydrasleeve
MW034	29/03/2024	2.373	12.45	19.5	17.13	Good	12/03/2024	5.22	100.2	60.1	6.0	96.9	296.9	30.2	Low	White	Organic	No sheen	Hydrasleeve
MW066	29/03/2024	2.671	8.98	23.19	20.52	Good	12/03/2024	5.21	120.8	72.5	6.3	110.8	310.8	30.4	Low	Grey	Odourless	No sheen	Hydrasleeve
MW080	29/02/2024	2.435	12.28	26.6	24.17	Good	1/03/2024	1.41	96.9	58.1	5.4	106.1	306.1	31.1	Low	Pale brown	Odourless	No sheen	Hydrasleeve
MW112	-	Did not measure due to tapped well					5/03/2024	5.22	0.6	0.4	5.7	265.7	465.7	35.7	Low	Colourless	Odourless	No sheen	Tap
MW113	-	Did not measure due to tapped well					5/03/2024	1.99	392.3	235.4	7.0	100.3	300.3	36.8	Low	Colourless	Odourless	No sheen	Tap

Notes:
mbTOC: metres below top of casing
mAHD: metres Australia Height Datum
mg/L: milligram per Litre
µS/cm: microsiemens per centimetre
mV: millivolts
°C: degrees celcius
DO Values not presented due to YSI malfunction for MW018, MW021, MW021D and MW023

Appendix B- Table 4
Groundwater Analytical Results
PFAS Ongoing Monitoring Plan
Department of Defence - Roberston Barracks

Table 4 - Groundwater Analytical Results

					PFAS Full Suite																														
					10:2 Fluorotelomer sulfonic acid (10:2 FTS)	4:2 Fluorotelomer sulfonic acid (4:2 FTS)	6:2 Fluorotelomer Sulfonate (6:2 FtS)	8:2 Fluorotelomer sulfonic acid (8:2 FTS)	N-Ethyl perfluorooctane sulfonamide (EtFOSA)	N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	N-Methyl perfluorooctane sulfonamide (MeFOSA)	N-Methyl perfluorooctane sulfonamidoacetic acid (MFOSAA)	N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	Perfluorobutane sulfonic acid (PFBS)	Perfluorobutanoic acid (PFBA)	Perfluorodecanesulfonic acid (PFDS)	Perfluorodecanoic acid (PFDA)	Perfluorododecanoic acid (PFDoDA)	Perfluoroheptane sulfonic acid (PFHpS)	Perfluoroheptanoic acid (PFHpA)	Perfluorohexanoic acid (PFHxA)	Perfluorononanoic acid (PFNA)	Perfluorooctane sulfonamide (FOSA)	Perfluoropentane sulfonic acid (PFPeS)	Perfluoropentanoic acid (PFPeA)	Perfluorotetradecanoic acid (PFTeDA)	Perfluorotridecanoic acid (PFTrDA)	Perfluoroundecanoic acid (PFUnDA)	Sum of PFAS	Sum of PFHxS and PFOS	Perfluorooctane sulfonic acid (PFOS)	Perfluorooctanoic Acid (PFOA)	Perfluorohexane sulfonic acid (PFHxS)
					µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
LOR					0.05	0.05	0.05	0.05	0.05	0.02	0.05	0.05	0.02	0.05	0.02	0.1	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.05	0.02	0.02	0.01	0.01	0.01	0.01	0.01
PFAS NEMP 2020 Drinking Water																															**0.07**		**0.56**	
PFAS NEMP 2020 Freshwater 99%																																*0.00023**	*19*	
Location Code	**Sampled Date**	**Field ID**	**Lab Report Number**	**Sample Type**																															
MW001	11/03/2024	1200_MW001_240306	ES2408291	Normal	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	0.13	0.13	*0.09*	<0.01	0.04
MW004	5/03/2024	1200_MW004_240305	ES2408291	Normal	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	0.13	0.13	*0.08*	<0.01	0.05
MW004D	5/03/2024	1200_MW004D_240305	ES2408291	Normal	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	<0.01	<0.01	*<0.01**	<0.01	<0.01
MW004D	5/03/2024	1200_QC100_240305	ES2408291	Field_D	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	<0.01	<0.01	*<0.01**	<0.01	<0.01
MW004D	5/03/2024	1200_QC200_240305	RN1422787	Interlab_D	<0.01	<0.01	<0.01	<0.01	<0.02	<0.01	<0.05	<0.02	<0.01	<0.05	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.02	<0.02	<0.02	<0.01	<0.01	*<0.02**	<0.01	<0.01
MW012	12/03/2024	1200_MW012_240312	ES2408291	Normal	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	<0.01	<0.01	*<0.01**	<0.01	<0.01
MW012D	12/03/2024	1200_MW012D_240312	ES2408291	Normal	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	<0.01	<0.01	*<0.01**	<0.01	<0.01
MW018	1/03/2024	1200_MW018_240301	ES2408291	Normal	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	<0.01	<0.01	*<0.01**	<0.01	<0.01
MW021	1/03/2024	1200_MW021_240301	ES2408291	Normal	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	<0.01	<0.01	*<0.01**	<0.01	<0.01
MW021D	1/03/2024	1200_MW021D_240301	ES2408291	Normal	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	0.03	0.03	*0.03*	<0.01	<0.01
MW023	1/03/2024	1200_MW023_240301	ES2408291	Normal	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	<0.01	<0.01	*<0.01**	<0.01	<0.01
MW029	8/03/2024	1200_MW029_240308	ES2408291	Normal	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	<0.01	<0.01	*<0.01**	<0.01	<0.01
MW030	8/03/2024	1200_MW030_240308	ES2408291	Normal	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	0.11	0.11	*0.07*	<0.01	0.04
MW031	8/03/2024	1200_MW031_240308	ES2408291	Normal	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	<0.01	<0.01	*<0.01**	<0.01	<0.01
MW032	11/03/2024	1200_MW032_240307	ES2408291	Normal	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	0.06	0.06	*0.04*	<0.01	0.02
MW034	12/03/2024	1200_MW034_240312	ES2408291	Normal	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	0.04	<0.02	<0.02	<0.02	0.03	<0.05	<0.02	<0.02	0.2	0.13	*0.1*	<0.01	0.03
MW034	12/03/2024	1200_QC101_240312	ES2408291	Field_D	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	0.04	<0.02	<0.02	<0.02	0.04	<0.05	<0.02	<0.02	0.21	**0.13**	*0.1*	<0.01	0.03
MW034	12/03/2024	1200_QC201_240312	RN1422787	Interlab_D	<0.01	<0.01	<0.01	<0.01	<0.02	<0.01	<0.05	<0.02	<0.01	<0.05	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	0.026	<0.01	<0.01	<0.01	<0.02	<0.02	<0.02	<0.01	0.12	**0.09**	*0.072*	<0.01	0.017
MW066	12/03/2024	1200_MW066_240307	ES2408291	Normal	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.03	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	0.07	<0.02	<0.02	0.03	0.02	<0.05	<0.02	<0.02	0.51	0.34	*0.16*	0.02	0.18
MW080	5/03/2024	1200_MW080_240305	ES2408291	Normal	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	0.03	0.03	*0.03*	<0.01	<0.01
MW112	5/03/2024	1200_MW112_240305	ES2408291	Normal	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	<0.01	<0.01	*<0.01**	<0.01	<0.01
MW113	5/03/2024	1200_MW113_240305	ES2408291	Normal	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	<0.01	<0.01	*<0.01**	<0.01	<0.01

Notes:
µg/L: micrograms per litre
LOR: limit of reporting
* LOR is above guideline value
Denotes first time detection above LOR for Sum of PFHxS+PFOS or PFOA
Denotes new exceedance of human health screening criteria

Appendix C

Calibration Certificate

Sampling round: 202311 & 202312_[redacted] **Location:** Robertson Barracks

Project number & name: 60719185 - WQMP

PM: [redacted] **Field staff:** [redacted]

Client: Vertia

Date	YSI #	Temp (°C)	pH 4		pH 7		DO (100%)		EC 1413 (µS/cm)		ORP (mV)		Initials
			Pre-cal	Post-cal	Pre-cal	Post-cal	Pre-cal	Post-cal	Pre-cal	Post-cal	Pre-cal	Post-cal	
[redacted]	D						100						
							100						
28/11/23	D	23.5	4.09	3.99	6.99	7.01	100		1383	—	233.2	—	[redacted]
							100						
11/12/23	B	Pre-calibrated by laboratory					100	—					
15/12/23	D	27.2	4.02	4.01	6.95	7.00	100	—	1473	1453	230.1	230.0	[redacted]
							100						
							100						
							100						
							100						
							100						
							100						
							100						
							100						
							100						
							100						
							100						
							100						
							100						

Notes:

Sampling round: 202403 [redacted] Location: Robertson Barracks

Project number & name: 60612561 & 60719185

PM: [redacted]

Field staff: [redacted]

Client: DoD + Ventia

Date	YSI #	Temp (°C)	pH 4		pH 7		DO (100%)		EC 1413 (µS/cm)		ORP (mV)		Initials
			Pre-cal	Post-cal	Pre-cal	Post-cal	Pre-cal	Post-cal	Pre-cal	Post-cal	Pre-cal	Post-cal	
1/3/24	C	Lab calibrated - First time use					100	–	–	–	–	–	
5/3/24	B	27.6	4.01	4.00	7.02	7.00	100	–	1430	1430	232.7	232.7	[redacted]
8/3/24	B	25.3	4.00	4.00	7.0	7.0	100	–	1420	1420	230.1	230.1	
12/3/24	B	25.0	4.02	4.00	7.0	7.0	100	–	1428	1428	234.0	234.0	
							100						
							100						
							100						
							100						
							100						
							100						
							100						
							100						
							100						
							100						
							100						
							100						
							100						
							100						

Notes:

DRAFT

Appendix D

Data Validation Report

AECOM

DATA VALIDATION REPORT

Project Manager:	[redacted]	**Validation by:**	[redacted]
Project number:	60612561	**Date:**	26/03/2024
Site:	1200 - Robertson Barracks		
Matrix:	Water	**Data Verified by:**	[redacted]
Laboratory:	ALS and NMI Sydney	**Date:**	27/03/2024
Lab reference:	ES2408291, RN1422787		

Key Findings:

- The potential exists for concentrations of PFOS to be above the adopted PFAS Freshwater 99% Species Protection guideline (0.00023 µg/L) but below the laboratory LOR (0.01 µg/L) for samples collected at MW004D, MW012, MW012D, MW018, MW021, MW023, MW029, MW031, MW112, MW113, SW007, SW023, SW028, SW086. This should be taken into consideration when interpreting results.
- Elevated RPDs should be taken into consideration when using data for PFOS quantitatively.

Component		Outliers			Material impact on interpretation
		No	Yes	Comment	
Frequency of field quality assurance/quality control (QAQC)		✓			No
Number of tests requested/reported		✓			No
Sample handling/preservation/holding times			✓	1	No
Frequency of laboratory QA/QC		✓			No
Limits of reporting (LOR)			✓	2	No
Blank analysis	Field blank	✓			No
	Rinsate blank	✓			No
	Trip blank	✓			No
	Method blank	✓			No
Field intra-laboratory relative percent differences (RPDs)		✓			No
Field inter-laboratory RPDs			✓	3	No
Laboratory duplicate RPDs		✓			No
Matrix spike (MS) % recoveries		✓			No
Laboratory control spike (LCS) % recoveries		✓			No
Surrogate % recoveries		✓			No
Other observations		✓			N/A

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Comments	
1. Sample handling/preservation/ holding times	Sample receipt temperature (11.9 -13.9°C) was outside of the recommended range (≤6°C) in primary laboratory batch ES2408291. The secondary laboratory batch was noted to be received as 'chilled'. Potential under reporting must be taken into consideration. However, as samples were received well the below ambient groundwater and surface water temperature at the time of sampling (~30 °C), the samples were immediately cooled upon collection the potential for under reporting is not considered to materially affect the interpretation of results.
2. Limits of Reporting (LOR)	Limits of reporting were sufficiently low to enable assessment against adopted guideline criteria, with the exception of PFOS in water. The potential exists for PFOS to be above the adopted PFAS Freshwater 99% Species Protection guideline (0.00023 µg/L), but below the laboratory LOR (0.01 µg/L) for samples collected at MW004D, MW012, MW012D, MW018, MW021, MW023, MW029, MW031, MW112, MW113, SW007, SW023, SW028, SW086.. This should be taken into consideration when interpreting PFOS results against guidelines where results are reported below the LOR.
3. Field inter-laboratory RPDs	Field inter-laboratory RPD's were reported within control limits, with the exception of the following (higher concentrations in **bold**): - **1200_MW034_240312** & 1200_QC201_240312 for PFOS (33%) As all concentrations of PFOS (and the sum of PFHxS+PFOS), were reported well above or well below the adopted guidelines and/or LOR, the elevated RPD is not considered to affect the interpretation of results against guidelines. However, the elevated RPD should be taken into consideration when using the data quantitatively.

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AECOM

DATA VALIDATION REPORT; WATER

Project Manager:	[redacted]	**Validation by:**	[redacted]
Project number:	60612561	**Date:**	15/01/2024
Site:	1200 – Robertson Barracks and Surrounds		
Matrix:	Water	**Data Verified by:**	[redacted]
Laboratory:	ALS Sydney; NMI Sydney	**Date:**	15/01/2024
Lab reference:	December 2023: ES2341145, ES2343723, RN1415098, RN1413202		

Key Findings:

The analytical data can be used as a basis for interpretation, subject to the limitations outlined below:

- The potential exists for concentrations of PFOS to be above the adopted PFAS Freshwater 99% Species Protection guideline (0.00023 µg/L), but below the laboratory LOR (0.01 µg/L) in primary samples, SW007, SW023, SW028 and SW086, and should be taken into consideration when interpreting results.

Component		Outliers			Material impact on interpretation
		No	Yes	Comment	
Frequency of field quality assurance/quality control		✓			No
Number of tests requested/reported		✓			No
Sample handling/preservation/holding times			✓	1	No
Frequency of laboratory QA/QC			✓	2	No
Limits of reporting (LOR)			✓	3	No
Blank analysis	Field blank	✓			No
	Rinsate blank	✓			No
	Trip blank	✓			No
	Method blank	✓			No
Field intra-laboratory relative percent differences (RPDs)		✓			No
Field inter-laboratory RPDs		✓			No
Laboratory duplicate RPDs		✓			No
Matrix spike (MS) % recoveries		✓			No
Laboratory control spike (LCS) % recoveries		✓			No
Surrogate % recoveries		✓			No
Other comments		✓			No

Comments

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DATA VALIDATION REPORT; WATER

Project Manager:	[redacted]	**Validation by:**	[redacted]
Project number:	60612561	**Date:**	15/01/2024
Site:	1200 – Robertson Barracks and Surrounds		
Matrix:	Water	**Data Verified by:**	[redacted]
Laboratory:	ALS Sydney; NMI Sydney	**Date:**	15/01/2024
Lab reference:	December 2023: ES2341145, ES2343723, RN1415098, RN1413202		

1. Sample handling/ preservation/ holding times

Laboratory batches were received slightly outside of the recommended temperature range (≤6°C):

Batch Number	Temperature (°C)
ES2341145	30.5 °C
ES2343723	6.4 °C
RN1415098	Chilled

Potential under reporting exists for the primary sample batches. However, as the temperatures were recorded well below the ambient sample temperature for primary sample batch ES2343723 at the time of sampling (~30°C), samples were immediately cooled upon collection, and due to the nature of PFAS, the likelihood of under reporting is unlikely and not considered to materially affect the interpretation of results. This also applies to primary lab batch ES2341145 as this sample was immediately taken to the laboratory after sampling and were cooled upon collection.

2. Frequency of laboratory QA/QC

Laboratory duplicate samples were not reported at the required frequency for PFAS in primary batches ES2341145 and ES2343723. The precision of the data can be assessed as acceptable based on intra- and inter-laboratory duplicate RPDs (which were reported at the required frequencies and within control limits), and available laboratory duplicate RPDs for the same analytical method group (which were reported within control limits).

3. Limits of reporting

Limits of reporting were sufficiently low to enable assessment against adopted guideline criteria, with the exception of PFOS in water.

The potential exists for PFOS to be above the adopted PFAS Freshwater 99% Species Protection guideline (0.00023 µg/L), but below the laboratory LOR (0.01 µg/L) for primary samples SW007, SW023, SW028 and SW086. This should be taken into consideration when interpreting PFOS results against guidelines where results are reported below the LOR.

Field QA/QC

	Lab Report Number	**ES2341145**	**ES2343723**	**ES2343723**	**ES2341145**	**ES2343723**	**ES2343723**	**ES2341145**	**ES2343723**
	Field ID	1200_QC300_231128	1200_QC301_231215	1200_QC300_231211	1200_QC400_231128	1200_QC400_231215	1200_QC400_231211	1200_QC500_231128	1200_QC500_231215
	Sampled Date	28/11/2023	15/12/2023	15/12/2023	28/11/2023	12/12/2023	15/12/2023	28/11/2023	12/12/2023
	Sample Type	Rinsate	Rinsate	Rinsate	Field Blank	Field Blank	Field Blank	Trip Blank	Trip Blank
Analyte	**Units**	**LOR**							
PFAS Full Suite									
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	µg/L	0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	µg/L	0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
6:2 Fluorotelomer Sulfonate (6:2 FtS)	µg/L	0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	µg/L	0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	µg/L	0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	µg/L	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	µg/L	0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamide (MeFOSA)	µg/L	0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoacetic acid (MFOSAA)	µg/L	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	µg/L	0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Perfluorobutane sulfonic acid (PFBS)	µg/L	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorobutanoic acid (PFBA)	µg/L	0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Perfluorodecanesulfonic acid (PFDS)	µg/L	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorodecanoic acid (PFDA)	µg/L	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorododecanoic acid (PFDoDA)	µg/L	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroheptane sulfonic acid (PFHpS)	µg/L	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroheptanoic acid (PFHpA)	µg/L	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorohexanoic acid (PFHxA)	µg/L	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorononanoic acid (PFNA)	µg/L	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorooctane sulfonamide (FOSA)	µg/L	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoropentane sulfonic acid (PFPeS)	µg/L	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoropentanoic acid (PFPeA)	µg/L	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotetradecanoic acid (PFTeDA)	µg/L	0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Perfluorotridecanoic acid (PFTrDA)	µg/L	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroundecanoic acid (PFUnDA)	µg/L	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Sum of PFAS	µg/L	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Sum of PFHxS and PFOS	µg/L	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Perfluorooctane sulfonic acid (PFOS)	µg/L	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Perfluorooctanoic Acid (PFOA)	µg/L	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Perfluorohexane sulfonic acid (PFHxS)	µg/L	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01

Field QA/QC

Lab Report Number	**ES2408291**	**ES2408291**	**ES2408291**	**ES2408291**	**ES2408291**	**ES2408291**	**ES2408291**	**ES2408291**	**ES2408291**	**ES2408291**
Field ID	1200_QC300_240301	1200_QC301_240305	1200_QC302_240306	1200_QC303_240307	1200_QC400_240301	1200_QC401_240305	1200_QC402_240306	1200_QC403_240307	1200_QC500_240301
Sampled Date	1/03/2024 11:02	5/03/2024 11:02	6/03/2024 11:02	7/03/2024 11:02	1/03/2024 11:02	5/03/2024 11:02	6/03/2024 11:02	7/03/2024 11:02	1/03/2024 11:02
Sample Type	Rinsate	Rinsate	Rinsate	Rinsate	Field Blank	Field Blank	Field Blank	Field Blank	Trip Blank

Analyte	**Units**	**LOR**									
Per- and Polyfluoroalkyl Substances (PFAS) by LCMS											
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	µg/L	0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	µg/L	0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
6:2 Fluorotelomer Sulfonate (6:2 FtS)	µg/L	0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	µg/L	0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	µg/L	0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	µg/L	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	µg/L	0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamide (MeFOSA)	µg/L	0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoacetic acid (MFOSAA)	µg/L	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	µg/L	0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Perfluorobutane sulfonic acid (PFBS)	µg/L	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorobutanoic acid (PFBA)	µg/L	0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Perfluorodecanesulfonic acid (PFDS)	µg/L	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorodecanoic acid (PFDA)	µg/L	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorododecanoic acid (PFDoDA)	µg/L	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroheptane sulfonic acid (PFHpS)	µg/L	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroheptanoic acid (PFHpA)	µg/L	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorohexanoic acid (PFHxA)	µg/L	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorononanoic acid (PFNA)	µg/L	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorooctane sulfonamide (FOSA)	µg/L	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoropentane sulfonic acid (PFPeS)	µg/L	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoropentanoic acid (PFPeA)	µg/L	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotetradecanoic acid (PFTeDA)	µg/L	0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Perfluorotridecanoic acid (PFTrDA)	µg/L	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroundecanoic acid (PFUnDA)	µg/L	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Sum of PFAS	µg/L	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Sum of PFHxS and PFOS	µg/L	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Perfluorooctane sulfonic acid (PFOS)	µg/L	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Perfluorooctanoic Acid (PFOA)	µg/L	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Perfluorohexane sulfonic acid (PFHxS)	µg/L	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01

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Relative Percentage Differences

	Lab Report Number	ES2341145	ES2341145		ES2343723	ES2343723		ES2343723	ES2343723		ES2341145	RN1413202		ES2343723	RN1415098		ES2343723	RN1415098	
	Field ID	1200_MW004D_231128	1200_QC100_231128	RPD	1200_SW059_231215	1200_QC100_231211	RPD	1200_SW007_231215	1200_QC100_231215	RPD	1200_MW004D_231128	1200_QC200_231128	RPD	1200_SW007_231215	1200_QC200_231215	RPD	1200_SW059_231215	1200_QC200_231211	RPD
	Sample Date	28/11/2023	28/11/2023		15/12/2023	15/12/2023		15/12/2023	15/12/2023		28/11/2023	28/11/2023		15/12/2023	15/12/2023		15/12/2023	15/12/2023	
	Sample Type	Primary	Intra-lab Duplicate		Primary	Intra-lab Duplicate		Primary	Intra-lab Duplicate		Primary	Inter-lab Duplicate		Primary	Inter-lab Duplicate		Primary	Inter-lab Duplicate	
Analyte	**Units**	**LOR**																	
PFAS Full Suite																			
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	µg/L	0.05 : 0.01 (Interlab)	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.01	0	<0.05	<0.01	0	<0.05	<0.01	0
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	µg/L	0.05 : 0.01 (Interlab)	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.01	0	<0.05	<0.01	0	<0.05	<0.01	0
6:2 Fluorotelomer Sulfonate (6:2 FtS)	µg/L	0.05 : 0.01 (Interlab)	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.01	0	<0.05	<0.01	0	<0.05	<0.01	0
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	µg/L	0.05 : 0.01 (Interlab)	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.01	0	<0.05	<0.01	0	<0.05	<0.01	0
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	µg/L	0.05 : 0.02 (Interlab)	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.02	0	<0.05	<0.02	0	<0.05	<0.02	0
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	µg/L	0.02 : 0.01 (Interlab)	<0.02	<0.02	0	<0.02	<0.02	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.01	0	<0.02	<0.01	0
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	µg/L	0.05	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0
N-Methyl perfluorooctane sulfonamide (MeFOSA)	µg/L	0.05 : 0.02 (Interlab)	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.02	0	<0.05	<0.02	0	<0.05	<0.02	0
N-Methyl perfluorooctane sulfonamidoacetic acid (MFOSAA)	µg/L	0.02 : 0.01 (Interlab)	<0.02	<0.02	0	<0.02	<0.02	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.01	0	<0.02	<0.01	0
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	µg/L	0.05	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0
Perfluorobutane sulfonic acid (PFBS)	µg/L	0.02 : 0.01 (Interlab)	<0.02	<0.02	0	<0.02	<0.02	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.01	0	<0.02	<0.01	0
Perfluorobutanoic acid (PFBA)	µg/L	0.1 : 0.05 (Interlab)	<0.1	<0.1	0	<0.1	<0.1	0	<0.1	<0.1	0	<0.1	<0.05	0	<0.1	<0.05	0	<0.1	<0.05	0
Perfluorodecanesulfonic acid (PFDS)	µg/L	0.02 : 0.01 (Interlab)	<0.02	<0.02	0	<0.02	<0.02	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.01	0	<0.02	<0.01	0
Perfluorodecanoic acid (PFDA)	µg/L	0.02 : 0.01 (Interlab)	<0.02	<0.02	0	<0.02	<0.02	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.01	0	<0.02	<0.01	0
Perfluorododecanoic acid (PFDoDA)	µg/L	0.02 : 0.01 (Interlab)	<0.02	<0.02	0	<0.02	<0.02	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.01	0	<0.02	<0.01	0
Perfluoroheptane sulfonic acid (PFHpS)	µg/L	0.02 : 0.01 (Interlab)	<0.02	<0.02	0	<0.02	<0.02	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.01	0	<0.02	<0.01	0
Perfluoroheptanoic acid (PFHpA)	µg/L	0.02 : 0.01 (Interlab)	<0.02	<0.02	0	<0.02	<0.02	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.01	0	<0.02	<0.01	0
Perfluorohexanoic acid (PFHxA)	µg/L	0.02 : 0.01 (Interlab)	<0.02	<0.02	0	<0.02	<0.02	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.01	0	<0.02	<0.01	0
Perfluorononanoic acid (PFNA)	µg/L	0.02 : 0.01 (Interlab)	<0.02	<0.02	0	<0.02	<0.02	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.01	0	<0.02	<0.01	0
Perfluorooctane sulfonamide (FOSA)	µg/L	0.02 : 0.01 (Interlab)	<0.02	<0.02	0	<0.02	<0.02	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.01	0	<0.02	<0.01	0
Perfluoropentane sulfonic acid (PFPeS)	µg/L	0.02 : 0.01 (Interlab)	<0.02	<0.02	0	<0.02	<0.02	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.01	0	<0.02	<0.01	0
Perfluoropentanoic acid (PFPeA)	µg/L	0.02	<0.02	<0.02	0	<0.02	<0.02	0	<0.02	<0.02	0	<0.02	<0.02	0	<0.02	<0.02	0	<0.02	<0.02	0
Perfluorotetradecanoic acid (PFTeDA)	µg/L	0.05 : 0.02 (Interlab)	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.02	0	<0.05	<0.02	0	<0.05	<0.02	0
Perfluorotridecanoic acid (PFTrDA)	µg/L	0.02	<0.02	<0.02	0	<0.02	<0.02	0	<0.02	<0.02	0	<0.02	<0.02	0	<0.02	<0.02	0	<0.02	<0.02	0
Perfluoroundecanoic acid (PFUnDA)	µg/L	0.02 : 0.01 (Interlab)	<0.02	<0.02	0	<0.02	<0.02	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.01	0	<0.02	<0.01	0
Perfluorooctane sulfonic acid (PFOS)	µg/L	0.01 : 0.02 (Interlab)	0.02	0.03	40	0.06	<0.01	143	<0.01	0.07	150	0.02	0.026	26	<0.01	<0.02	0	0.06	0.065	8
Perfluorooctanoic Acid (PFOA)	µg/L	0.01	<0.01	<0.01	0	<0.01	<0.01	0	<0.01	<0.01	0	<0.01	<0.01	0	<0.01	<0.01	0	<0.01	<0.01	0
Perfluorohexane sulfonic acid (PFHxS)	µg/L	0.01	<0.01	<0.01	0	<0.01	<0.01	0	<0.01	0.01	0	<0.01	<0.01	0	<0.01	<0.01	0	<0.01	0.011	10

**High RPDs are in bold (Acceptable RPDs for each LOR multiplier range are: 200 (1-10 x LOR); 50 (10-20 x LOR); 30 (> 20 x LOR))
***Interlab Duplicates are matched on a per compound basis as methods vary between laboratories. Any methods in the row header relate to those used in the primary laboratory

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Relative Percentage Differences

Lab Report Number	**ES2408291**	**ES2408291**		**ES2408291**	**ES2408291**		**ES2408291**	**RN1422787**		**ES2408291**	**RN1422787**	
Field ID	1200_MW004D_240305	1200_QC100_240305	**RPD**	1200_MW034_240312	1200_QC101_240312	**RPD**	1200_MW004D_240305	1200_QC200_240305	**RPD**	1200_MW034_240312	1200_QC201_240312	**RPD**
Sampled Date	5/03/2024	5/03/2024		12/03/2024	12/03/2024		5/03/2024	5/03/2024		12/03/2024	12/03/2024	
Sample Type	5/03/2024 14:08	5/03/2024 14:08		12/03/2024 15:15	12/03/2024 15:15		5/03/2024 14:08	5/03/2024 14:08		12/03/2024 15:15	12/03/2024 15:15	

Analyte	**Units**	**LOR**												
Per- and Polyfluoroalkyl Substances (PFAS) by LCMS														
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	µg/L	0.05 : 0.01 (Interlab)	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.01	0	<0.05	<0.01	0
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	µg/L	0.05 : 0.01 (Interlab)	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.01	0	<0.05	<0.01	0
6:2 Fluorotelomer Sulfonate (6:2 FtS)	µg/L	0.05 : 0.01 (Interlab)	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.01	0	<0.05	<0.01	0
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	µg/L	0.05 : 0.01 (Interlab)	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.01	0	<0.05	<0.01	0
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	µg/L	0.05 : 0.02 (Interlab)	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.02	0	<0.05	<0.02	0
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	µg/L	0.02 : 0.01 (Interlab)	<0.02	<0.02	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.01	0
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	µg/L	0.05	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0
N-Methyl perfluorooctane sulfonamide (MeFOSA)	µg/L	0.05 : 0.02 (Interlab)	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.02	0	<0.05	<0.02	0
N-Methyl perfluorooctane sulfonamidoacetic acid (MFOSAA)	µg/L	0.02 : 0.01 (Interlab)	<0.02	<0.02	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.01	0
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	µg/L	0.05	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0
Perfluorobutane sulfonic acid (PFBS)	µg/L	0.02 : 0.01 (Interlab)	<0.02	<0.02	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.01	0
Perfluorobutanoic acid (PFBA)	µg/L	0.1 : 0.05 (Interlab)	<0.1	<0.1	0	<0.1	<0.1	0	<0.1	<0.05	0	<0.1	<0.05	0
Perfluorodecanesulfonic acid (PFDS)	µg/L	0.02 : 0.01 (Interlab)	<0.02	<0.02	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.01	0
Perfluorodecanoic acid (PFDA)	µg/L	0.02 : 0.01 (Interlab)	<0.02	<0.02	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.01	0
Perfluorododecanoic acid (PFDoDA)	µg/L	0.02 : 0.01 (Interlab)	<0.02	<0.02	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.01	0
Perfluoroheptane sulfonic acid (PFHpS)	µg/L	0.02 : 0.01 (Interlab)	<0.02	<0.02	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.01	0
Perfluoroheptanoic acid (PFHpA)	µg/L	0.02 : 0.01 (Interlab)	<0.02	<0.02	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.01	0
Perfluorohexanoic acid (PFHxA)	µg/L	0.02 : 0.01 (Interlab)	<0.02	<0.02	0	0.04	0.04	0	<0.02	<0.01	0	0.04	0.026	42
Perfluorononanoic acid (PFNA)	µg/L	0.02 : 0.01 (Interlab)	<0.02	<0.02	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.01	0
Perfluorooctane sulfonamide (FOSA)	µg/L	0.02 : 0.01 (Interlab)	<0.02	<0.02	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.01	0
Perfluoropentane sulfonic acid (PFPeS)	µg/L	0.02 : 0.01 (Interlab)	<0.02	<0.02	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.01	0
Perfluoropentanoic acid (PFPeA)	µg/L	0.02	<0.02	<0.02	0	0.03	0.04	29	<0.02	<0.02	0	0.03	<0.02	40
Perfluorotetradecanoic acid (PFTeDA)	µg/L	0.05 : 0.02 (Interlab)	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.02	0	<0.05	<0.02	0
Perfluorotridecanoic acid (PFTrDA)	µg/L	0.02	<0.02	<0.02	0	<0.02	<0.02	0	<0.02	<0.02	0	<0.02	<0.02	0
Perfluoroundecanoic acid (PFUnDA)	µg/L	0.02 : 0.01 (Interlab)	<0.02	<0.02	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.01	0
Perfluorooctane sulfonic acid (PFOS)	µg/L	0.01 : 0.02 (Interlab)	<0.01	<0.01	0	0.1	0.1	0	<0.01	<0.02	0	**0.1**	**0.072**	**33**
Perfluorooctanoic Acid (PFOA)	µg/L	0.01	<0.01	<0.01	0	<0.01	<0.01	0	<0.01	<0.01	0	<0.01	<0.01	0
Perfluorohexane sulfonic acid (PFHxS)	µg/L	0.01	<0.01	<0.01	0	0.03	0.03	0	<0.01	<0.01	0	0.03	0.017	55

**High RPDs are in bold (Acceptable RPDs for each LOR multiplier range are: 200 (1-10 x LOR); 50 (10-20 x LOR); 30 (> 20 x LOR))

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

Appendix E

Chain of Custody

CHAIN OF CUSTODY

ALS Environmental

ALS Laboratory: please tick →

ADELAIDE 21 Burma Road Pooraka SA 5095 Ph: 08 8359 0890 E: adelaide@alsglobal.com
BRISBANE 32 Shand Street Stafford QLD 4053 Ph: 07 3243 7222 E: samples.brisbane@alsglobal.com
GLADSTONE 46 Callemondah Drive Clinton QLD 4680 Ph: 07 7471 5600 E: gladstone@alsglobal.com
MACKAY 78 Harbour Road Mackay QLD 4740 Ph: 07 4944 0177 E: mackay@alsglobal.com
MELBOURNE 2-4 Westall Road Springvale VIC 3171 Ph: 03 8549 9600 E: samples.melbourne@alsglobal.com
MUDGEE 27 Sydney Road Mudgee NSW 2850 Ph: 02 6372 6735 E: mudgee.mail@alsglobal.com
NEWCASTLE 5/585 Maitland Rd Mayfield West NSW 2304 Ph: 02 4014 2500 E: samples.newcastle@alsglobal.com
NOWRA 4/13 Geary Place North Nowra NSW 2541 Ph: 024423 2063 E: nowra@alsglobal.com
PERTH 10 Hod Way Malaga WA 6090 Ph: 08 9209 7655 E: samples.perth@alsglobal.com
SYDNEY 277-289 Woodpark Road Smithfield NSW 2164 Ph: 02 8784 8555 E: samples.sydney@alsglobal.com
TOWNSVILLE 14-15 Desma Court Bohle QLD 4818 Ph: 07 4796 0600 E: townsville.environmental@alsglobal.com
WOLLONGONG 99 Kenny Street Wollongong NSW 2500 Ph: 02 4225 3125 E: portkembla@alsglobal.com

CLIENT: [redacted]
OFFICE: [redacted]
PROJECT: NT_1200_PFASOMP_23
ORDER NUMBER: 60612561/2.1

TURNAROUND REQUIREMENTS: (Standard TAT may be longer for some tests e.g. Ultra Trace Organics)
☐ Standard TAT (List due date):
☐ Non Standard or urgent TAT (List due date):
ALS QUOTE NO.: SY/139/19 V3

COC SEQUENCE NUMBER (Circle)
COC: 1 2 3 4 5 6 7
OF: 1 2 3 4 5 6 7

FOR LABORATORY USE ONLY (Circle)
Custody Seal Intact? Yes No N/A
Free ice / frozen ice bricks present upon receipt? Yes No N/A
Random Sample Temperature on Receipt: °C
Other comment:

[redacted]

28/11/23 12:44 2:16 pm

RELINQUISHED BY: [redacted]
DATE/TIME: 29/11/23 1530

ANALYSIS/SPECIAL HANDLING/STORAGE OR DISPOSAL:

ALS USE	SAMPLE DETAILS MATRIX: SOLID (S) WATER (W)			CONTAINER INFORMATION		ANALYSIS REQUIRED Including SUITES (NB. Suite Codes must be listed to attract suite price) Where Metals are required, specify Total (unfiltered bottle required) or Dissolved (field filtered bottle required).	Additional Information
LAB ID	SAMPLE ID	DATE / TIME	MATRIX	TYPE & PRESERVATIVE (refer to codes below)	TOTAL CONTAINERS	EP231X Full PFAS	
1	1200-MW004D_231128	28/11/23 8:29	W	2x PFAS,	1	1	
SW2	1200_SW086_231128	9:31		2x PFAS, [redacted]	1	1	
SW3	1200_SW123_231128	10:00		glass	1	1	
SW4	1200_SW091_231128	10:25			1	1	
5	1200_QC100_231128			2x PFAS	1	1	
6	1200_QC200_231128			2x PFAS	1	1	
7	1200-QC300_231128			2	1	1	
8	1200_QC400_231128				1	1	
9	1200-QC500_231128				1	1	
				TOTAL	18		

Environmental Division
Sydney
Work Order Reference
ES2341145

Telephone : +61-2-8784 8555

Please send to NMI Sydney

Subcon / Forward Lab / Split WO
Lab / Analysis: NMI
Organised By / Date:
Relinquished By / Date:
Connote / Courier: QC FWD
WO No: ES2341145
Attach By FO / Internal Sheet:

LAB OF ORIGIN: DARWIN

Water Container Codes: P = Unpreserved Plastic; N = Nitric Preserved Plastic; ORC = Nitric Preserved ORC; SH = Sodium Hydroxide/Cd Preserved; S = Sodium Hydroxide Preserved Plastic; AG = Amber Glass Unpreserved; AP = Airfreight Unpreserved Plastic; V = VOA Vial HCl Preserved; VB = VOA Vial Sodium Bisulphate Preserved; VS = VOA Vial Sulfuric Preserved; AV = Airfreight Unpreserved Vial SG = Sulfuric Preserved Amber Glass; H = HCl preserved Plastic; HS = HCl preserved Speciation bottle; SP = Sulfuric Preserved Plastic; F = Formaldehyde Preserved Glass; Z = Zinc Acetate Preserved Bottle; E = EDTA Preserved Bottles; ST = Sterile Bottle; ASS = Plastic Bag for Acid Sulphate Soils; B = Unpreserved Bag.

CHAIN OF CUSTODY

ALS COC#: 61425 ALS Laboratory: ES Sydney Environmental

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	[redacted] 19/12/23 0830

CLIENT: [redacted]

PROJECT: NT_1200_PFASOMP_23

SITE: Robertson Barracks - OMP SW

ORDER NO: 60612561/2.1

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: SAMPLER MOBILE:

QUOTE NO: SY/139/19 V3 / ES2019AECOMAU003 0

EMAIL REPORTS TO: [redacted]

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact?	Yes	No	N/A
Free ice / frozen ice bricks present upon receipt?	Yes	No	N/A
Random Sample Temperature on Receipt:		°C	
Other comments:			

Environmental Division Sydney

Work Order Reference

ES2343723

Telephone : – 61-2-8784 8555

SAMPLE DETAILS							ANALYSIS REQUIRED		
SAMPLE	NAME	DESCRIPTION	DATE / TIME	MATRIX	TOTAL BOTTLES	ON HOLD	PFAS Waters WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
001	1200_SW028_231215		15/12/2023 04:31 PM	WATER	ALS: 3 Non ALS: 0	No	X		
002	1200_SW075_231215		15/12/2023 04:32 PM	WATER	ALS: 3 Non ALS: 0	No	X		
003	1200_QC100_231215		12/12/2023 09:45 AM	WATER	ALS: 2 Non ALS: 0	No	X		
~~004~~	1200_QC200_231215	Pls fwd to NMI for analysis	12/12/2023 09:45 AM	WATER	ALS: 2 Non ALS: 0	No	X		
005	1200_QC301_231215		15/12/2023 04:40 PM	WATER	ALS: 2 Non ALS: 0	No	X		
006	1200_QC400_231215		12/12/2023 09:46 AM	WATER	ALS: 2 Non ALS: 0	No	X		
007	1200_QC500_231215		12/12/2023 09:46 AM	WATER	ALS: 1 Non ALS: 0	No	X		

Subcon / Forward Lab / Split WO

Lab / Analysis: NMI

Organised By / Date:

Relinquished By / Date:

Connote / Courier: QCLCD

WO No: ES2343723

Attach By PO / Internal Sheet:

CHAIN OF CUSTODY

COC#: 61425 *ALS Laboratory:* ES Sydney Environmental

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:
DATE TIME:	DATE TIME:	DATE TIME: [redacted] 19/12/23 0830

CLIENT: [redacted]

PROJECT: NT_1200_PFASOMP_23

SITE: Robertson Barracks - OMP SW

ORDER NO: 60612561/2.1

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH:

QUOTE NO: SY/139/19 V3

SAMPLER MOBILE:

/ ES2019AECOMAU0030

EMAIL REPORTS TO: [redacted]

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

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

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE DETAILS							ANALYSIS REQUIRED		
SAMPLE	NAME	DESCRIPTION	DATE / TIME	MATRIX	TOTAL BOTTLES	ON HOLD	PFAS Waters WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
008	1200_SW001_231012		15/12/2023 04:34 PM	WATER	ALS: 2 Non ALS: 0	No	X		
009	1200_SW007_231215		15/12/2023 04:35 PM	WATER	ALS: 3 Non ALS: 0	No	X		
010	1200_SW023_231215		15/12/2023 04:37 PM	WATER	ALS: 3 Non ALS: 0	No	X		
011	1200_SW059_231215		15/12/2023 04:42 PM	WATER	ALS: 3 Non ALS: 0	No	X		
012	1200_QC100_231215		15/12/2023 04:43 PM	WATER	ALS: 2 Non ALS: 0	No	X		
013	1200_QC200_231215		15/12/2023 04:45 PM	WATER	ALS: 2 Non ALS: 0	No	X		
014	1200_QC300_231211		15/12/2023 04:49 PM	WATER	ALS: 2 Non ALS: 0	No	X		

CHAIN OF CUSTODY

(ALS) COC#: 61425 ALS Laboratory: ES Sydney Environmental

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	[redacted] 19/12/23 0830

CLIENT: [redacted]

PROJECT: NT_1200_PFASOMP_23

SITE: Robertson Barracks - OMP SW

ORDER NO: 60612561/2.1

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH:

QUOTE NO: SY/139/19 V3

SAMPLER MOBILE:

/ ES2019AECOMAU0030

EMAIL REPORTS TO: [redacted]

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact?	Yes	No	N/A
Free ice / frozen ice bricks present upon receipt?	Yes	No	N/A
Random Sample Temperature on Receipt:		°C	
Other comments:			

SAMPLE DETAILS							ANALYSIS REQUIRED		
SAMPLE	NAME	DESCRIPTION	DATE / TIME	MATRIX	TOTAL BOTTLES	ON HOLD	PFAS Waters WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
015	1200_QC400_231211		15/12/2023 04:50 PM	WATER	ALS: 2 Non ALS: 0	No	X		

CHAIN OF CUSTODY

COC#: 61425 ALS Laboratory: ES Sydney Environmental

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	[redacted] DATE TIME: 19/12/23 0830

CLIENT: [redacted]

PROJECT: NT_1200_PFASOMP_23

SITE: Robertson Barracks - OMP SW

ORDER NO: 60612561/2.1

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH:

QUOTE NO: SY/139/19 V3

SAMPLER MOBILE: / ES2019AECOMAU0030

EMAIL REPORTS TO: [redacted]

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

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

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE	SAMPLE NAME	BOTTLE NAME	VOLUME	BARCODE	TYPE	FILTERED	REASON
001	1200_SW028_231215	HDPE (no PTFE)	20 mL	00350719054587	Grey	No	
001	1200_SW028_231215	HDPE (no PTFE)	20 mL	00352309065631	Grey	No	
001	1200_SW028_231215	HDPE (no PTFE)	20 mL	00352309065729	Grey	No	
002	1200_SW075_231215	HDPE (no PTFE)	20 mL	00350719054562	Grey	No	
002	1200_SW075_231215	HDPE (no PTFE)	20 mL	00352309065574	Grey	No	
002	1200_SW075_231215	HDPE (no PTFE)	20 mL	00352309065556	Grey	No	
003	1200_QC100_231215	HDPE (no PTFE)	20 mL	00352309065481	Grey	No	
003	1200_QC100_231215	HDPE (no PTFE)	20 mL	00352309065547	Grey	No	
004	1200_QC200_231215	HDPE (no PTFE)	20 mL	00352309065462	Grey	No	
004	1200_QC200_231215	HDPE (no PTFE)	20 mL	00352309065439	Grey	No	
005	1200_QC301_231215	HDPE (no PTFE)	20 mL	00351221009237	Grey	No	
005	1200_QC301_231215	HDPE (no PTFE)	20 mL	00351221009353	Grey	No	
006	1200_QC400_231215	HDPE (no PTFE)	20 mL	00351221011509	Grey	No	
006	1200_QC400_231215	HDPE (no PTFE)	20 mL	00351221011497	Grey	No	
007	1200_QC500_231215	HDPE (no PTFE)	20 mL	00350522025969	Grey	No	
008	1200_SW001_231012	HDPE (no PTFE)	20 mL	00351221011632	Grey	No	
008	1200_SW001_231012	HDPE (no PTFE)	20 mL	00351221011884	Grey	No	
009	1200_SW007_231215	HDPE (no PTFE)	20 mL	00350719054593	Grey	No	
009	1200_SW007_231215	HDPE (no PTFE)	20 mL	00352309065435	Grey	No	
009	1200_SW007_231215	HDPE (no PTFE)	20 mL	00352309065627	Grey	No	
010	1200_SW023_231215	HDPE (no PTFE)	20 mL	00350719054563	Grey	No	
010	1200_SW023_231215	HDPE (no PTFE)	20 mL	00352309065626	Grey	No	
010	1200_SW023_231215	HDPE (no PTFE)	20 mL	00352309065495	Grey	No	
011	1200_SW059_231215	HDPE (no PTFE)	20 mL	00350719054575	Grey	No	
011	1200_SW059_231215	HDPE (no PTFE)	20 mL	00350822057979	Grey	No	
011	1200_SW059_231215	HDPE (no PTFE)	20 mL	00350822058049	Grey	No	

CHAIN OF CUSTODY

COC#: 61425 *ALS Laboratory:* ES Sydney Environmental

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	[redacted] 19/12/23 0830

CLIENT: [redacted]

PROJECT: NT_1200_PFASOMP_23

SITE: Robertson Barracks - OMP SW

ORDER NO: 60612561/2.1

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH:

QUOTE NO: SY/139/19 V3

SAMPLER MOBILE:

/ ES2019AECOMAU0030

EMAIL REPORTS TO: [redacted]

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

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

Random Sample Temperature on Receipt: °C

Other comments:

012	1200_QC100_231215	HDPE (no PTFE)	20 mL	00350822058007	Grey	No	
012	1200_QC100_231215	HDPE (no PTFE)	20 mL	00350522025909	Grey	No	
013	1200_QC200_231215	HDPE (no PTFE)	20 mL	00350522025823	Grey	No	
013	1200_QC200_231215	HDPE (no PTFE)	20 mL	00350522025871	Grey	No	
014	1200_QC300_231211	HDPE (no PTFE)	20 mL	00352309065465	Grey	No	
014	1200_QC300_231211	HDPE (no PTFE)	20 mL	00352309065570	Grey	No	
015	1200_QC400_231211	HDPE (no PTFE)	20 mL	00352309065519	Grey	No	
015	1200_QC400_231211	HDPE (no PTFE)	20 mL	00352309065490	Grey	No	

Total Bottle Count: ALS: 34, Non ALS: 0

AEC006/231201 Am
Due: 8/12/23

CHAIN OF CUSTODY

ALS Environmental

ALS Laboratory: please tick →

☐ADELAIDE 21 Burma Road Pooraka SA 5095 Ph: 08 8359 0690 E: adelaide@alsglobal.com
☐BRISBANE 32 Shand Street Stafford QLD 4053 Ph: 07 3243 7222 E: samples.brisbane@alsglobal.com
☐GLADSTONE 46 Callemondah Drive Clinton QLD 4680 Ph: 07 7471 5600 E: gladstone@alsglobal.com
☐MACKAY 78 Harbour Road Mackay QLD 4749 Ph: 07 4944 0177 E: mackay@alsglobal.com
☐MELBOURNE 2-4 Westall Road Springvale VIC 3171 Ph: 03 8549 9600 E: samples.melbourne@alsglobal.com
☐MUDGEE 27 Sydney Road Mudgee NSW 2850 Ph: 02 6372 6735 E: mudgee.mail@alsglobal.com
☐NEWCASTLE 5/585 Maitland Rd Mayfield West NSW 2304 Ph: 02 4014 2500 E: samples.newcastle@alsglobal.com
☐NOWRA 4/13 Geary Place North Nowra NSW 2541 Ph: 024423 2063 E: nowra@alsglobal.com
☐PERTH 10 Hod Way Malaga WA 6090 Ph: 08 9209 7655 E: samples.perth@alsglobal.com
☐SYDNEY 277-289 Woodpark Road Smithfield NSW 2164 Ph: 02 8784 8555 E: samples.sydney@alsglobal.com
☐TOWNSVILLE 14-15 Desma Court Bohle QLD 4818 Ph: 07 4796 0600 E: townsville.environmental@alsglobal.com
☐WOLLONGONG 99 Kenny Street Wollongong NSW 2500 Ph: 02 4225 3125 E: portkembla@alsglobal.com

CLIENT: [redacted]	TURNAROUND REQUIREMENTS: [redacted] Standard TAT (List due date):
OFFICE: Darwin	(Standard TAT may be longer for some tests e.g. Ultra Trace Organics) ☐ Non Standard or urgent TAT (List due date):
PROJECT: NT_1200_PFASOMP_23	ALS QUOTE NO.: SY/139/19 V3
ORDER NUMBER: 60612561/2.1	COC SEQUENCE NUMBER (Circle) COC: 1 2 3 4 5 6 7 OF: 1 2 3 4 5 6 7
PROJECT MANAGER [redacted]	CONTACT PH:
SAMPLER: [redacted]	SAMPLER MOBILE: [redacted]
[redacted]	RE [redacted]
	DAT 28/11/23 12:44 2:16 pm

FOR LABORATORY USE ONLY (Circle)

Custody Seal Intact?	Yes	No	N/A
Free ice / frozen ice bricks present upon receipt?	Yes	No	N/A
Random Sample Temperature on Receipt:		°C	
Other comment:			

RELINQUISHED BY: [redacted]

DATE/TIME: 24/11/23 1630

COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL:

ALS USE	SAMPLE DETAILS MATRIX: SOLID (S) WATER (W)			CONTAINER INFORMATION		ANALYSIS REQUIRED including SUITES (NB. Suite Codes must be listed to attract suite price) Where Metals are required, specify Total (unfiltered bottle required) or Dissolved (field filtered bottle required).	Additional Information
LAB ID	SAMPLE ID	DATE / TIME	MATRIX	TYPE & PRESERVATIVE (refer to codes below)	TOTAL CONTAINERS	EP231X Full PFAS	
1	1200-MW004D_231128	28/11/23 8:24	W	2x PFAS,	1	1	
2	1200_SW086_231128	9:31		2x PFAS, [redacted]	1	1	
3	1200_SW123_231128	10:00			1	1	
4	1200_SW091_231128	10:25			1	1	
5	1200_QC100_231128			2x PFAS	1	1	
6	1200_QC200_231128			2x PFAS N23/025445	1	1	
7	1200_QC300_231128			2	1	1	
8	1200_QC400_231128				1	1	
	1200-QC500_231128				1	1	
				TOTAL	18		

Environmental Division Sydney
Work Order Reference
ES2341145

Telephone : +61-2-8784 8555

RECEIVED
01 DEC 2023
BY: AO 1550 C

Please send to NM1 Sydney

Subcon / Forward Lab / Split WO
Lab / Analysis: NM1
Organised By / Date:
Relinquished By / Date:
Connote / Courier: QC FWD
WO No: ES2341145
Attach By PO / Internal Sheet:

LAB OF ORIGIN: DARWIN

Container Codes: P = Unpreserved Plastic; N = Nitric Preserved Plastic; ORC = Nitric Preserved ORC; SH = Sodium Hydroxide/Cd Preserved; S = Sodium Hydroxide Preserved Plastic; AG = Amber Glass Unpreserved; AP - Airfreight Unpreserved Plastic
VOA Vial HCl Preserved; VB = VOA Vial Sodium Bisulphate Preserved; VS = VOA Vial Sulfuric Preserved; AV = Airfreight Unpreserved Vial SG = Sulfuric Preserved Amber Glass; H = HCl preserved Plastic; HS = HCl preserved Speciation bottle; SP = Sulfuric Preserved Plastic; F = Formaldehyde Preserved Glass;
Zinc Acetate Preserved Bottle; E = EDTA Preserved Bottles; ST = Sterile Bottle; ASS = Plastic Bag for Acid Sulphate Soils; B = Unpreserved Bag.

CHAIN OF CUSTODY

ALS COC#: 61425 ALS Laboratory: ES Sydney Environmental

CLIENT: [redacted]

PROJECT: NT_1200_PFASOMP_23

SITE: Robertson Barracks - OMP SW

ORDER NO: 60612561/2.1

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH:

QUOTE NO: SY/139/19 V3

SAMPLER MOBILE:

/ ES2019AECOMAU003 0

EMAIL REPORTS TO: [redacted]

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	[redacted] DATE TIME: 19/12/23 0830

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle) 5/1

Custody Seal intact?	Yes	No	N/A
Free ice / frozen ice bricks present upon receipt?	Yes	No	N/A
Random Sample Temperature on Receipt:		°C	

Other comments: AECOOG /231220/4

Environmental Division Sydney

Work Order Reference ES2343723

Telephone : +61-2-8784 8555

RECEIVED 20 DEC 2023 By: RJ 13:30

SAMPLE DETAILS							ANALYSIS REQUIRED		
SAMPLE	NAME	DESCRIPTION	DATE / TIME	MATRIX	TOTAL BOTTLES	ON HOLD	PFAS Waters WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
001	1200_SW028_231215		15/12/2023 04:31 PM	WATER	ALS: 3 Non ALS: 0	No	X		
002	1200_SW075_231215		15/12/2023 04:32 PM	WATER	ALS: 3 Non ALS: 0	No	X		
003	1200_QC100_231215		12/12/2023 09:45 AM	WATER	ALS: 2 Non ALS: 0	No	X		
~~004~~ 004*	1200_QC200_231215 1200-QC200-231211	Pls fwd to NMI for analysis	12/12/2023 09:45 AM	WATER	ALS: 2 Non ALS: 0	No	X		
005	1200_QC301_231215		15/12/2023 04:40 PM	WATER	ALS: 2 Non ALS: 0	No	X		
006	1200_QC400_231215		12/12/2023 09:46 AM	WATER	ALS: 2 Non ALS: 0	No	X		
007	1200_QC500_231215		12/12/2023 09:46 AM	WATER	ALS: 1 Non ALS: 0	No	X		

Subcon / Forward to: Split WO

Lab / Analysis: NMI

Organised By / Date:

Relinquished By / Date:

Courier: QCLD

WO No: ES2343723

Attach By PO / Internal Sheet:

* - 1200-QC200-231211 - ~~extra sample received~~

N23/027139

RJ

CHAIN OF CUSTODY

COC#: 61425 *ALS Laboratory:* ES Sydney Environmental

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	[redacted] DATE TIME: 19/12/23 0830

CLIENT: [redacted]

PROJECT: NT_1200_PFASOMP_23

SITE: Robertson Barracks - OMP SW

ORDER NO: 60612561/2.1

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH:

QUOTE NO: SY/139/19 V3

SAMPLER MOBILE: / ES2019AECOMAU0030

EMAIL REPORTS TO: [redacted]

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

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

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE DETAILS							ANALYSIS REQUIRED		
SAMPLE	NAME	DESCRIPTION	DATE / TIME	MATRIX	TOTAL BOTTLES	ON HOLD	PFAS Waters WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
008	1200_SW001_231012		15/12/2023 04:34 PM	WATER	ALS: 2 Non ALS: 0	No	X		
009	1200_SW007_231215		15/12/2023 04:35 PM	WATER	ALS: 3 Non ALS: 0	No	X		
010	1200_SW023_231215		15/12/2023 04:37 PM	WATER	ALS: 3 Non ALS: 0	No	X		
011	1200_SW059_231215		15/12/2023 04:42 PM	WATER	ALS: 3 Non ALS: 0	No	X		
012	1200_QC100_231215		15/12/2023 04:43 PM	WATER	ALS: 2 Non ALS: 0	No	X		
013	1200_QC200_231215		15/12/2023 04:45 PM	WATER	ALS: 2 Non ALS: 0	No	X		N23/027238
014	1200_QC300_231211		15/12/2023 04:49 PM	WATER	ALS: 2 Non ALS: 0	No	X		

RECEIVED
20 DEC 2023
BY:

Extra sample received

CHAIN OF CUSTODY

COC#: 61425 *ALS Laboratory:* ES Sydney Environmental

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	[redacted] 19/12/23 0830

CLIENT: [redacted]

PROJECT: NT_1200_PFASOMP_23

SITE: Robertson Barracks - OMP SW

ORDER NO: 60612561/2.1

PROJECT MANAGER: [redacted]
PRIMARY SAMPLER:

CONTACT PH:

QUOTE NO: SY/139/19 V3

SAMPLER MOBILE:

/ ES2019AECOMAU0030

EMAIL REPORTS TO: [redacted],

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

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

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE DETAILS							ANALYSIS REQUIRED		
SAMPLE	NAME	DESCRIPTION	DATE / TIME	MATRIX	TOTAL BOTTLES	ON HOLD	PFAS Waters WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
015	1200_QC400_231211		15/12/2023 04:50 PM	WATER	ALS: 2 Non ALS: 0	No	X		

CHAIN OF CUSTODY

COC#: 61425 *ALS Laboratory:* ES Sydney Environmental

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	[redacted] DATE TIME: 19/12/23 0830

CLIENT: [redacted]

PROJECT: NT_1200_PFASOMP_23

SITE: Robertson Barracks - OMP SW

ORDER NO: 60612561/2.1

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH:

QUOTE NO: SY/139/19 V3

SAMPLER MOBILE:

/ ES2019AECOMAU0030

EMAIL REPORTS TO: [redacted]

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

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

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE	SAMPLE NAME	BOTTLE NAME	VOLUME	BARCODE	TYPE	FILTERED	REASON
001	1200_SW028_231215	HDPE (no PTFE)	20 mL	00350719054587	Grey	No	
001	1200_SW028_231215	HDPE (no PTFE)	20 mL	00352309065631	Grey	No	
001	1200_SW028_231215	HDPE (no PTFE)	20 mL	00352309065729	Grey	No	
002	1200_SW075_231215	HDPE (no PTFE)	20 mL	00350719054562	Grey	No	
002	1200_SW075_231215	HDPE (no PTFE)	20 mL	00352309065574	Grey	No	
002	1200_SW075_231215	HDPE (no PTFE)	20 mL	00352309065556	Grey	No	
003	1200_QC100_231215	HDPE (no PTFE)	20 mL	00352309065481	Grey	No	
003	1200_QC100_231215	HDPE (no PTFE)	20 mL	00352309065547	Grey	No	
004	1200_QC200_231215	HDPE (no PTFE)	20 mL	00352309065462	Grey	No	
004	1200_QC200_231215	HDPE (no PTFE)	20 mL	00352309065439	Grey	No	
005	1200_QC301_231215	HDPE (no PTFE)	20 mL	00351221009237	Grey	No	
005	1200_QC301_231215	HDPE (no PTFE)	20 mL	00351221009353	Grey	No	
006	1200_QC400_231215	HDPE (no PTFE)	20 mL	00351221011509	Grey	No	
006	1200_QC400_231215	HDPE (no PTFE)	20 mL	00351221011497	Grey	No	
007	1200_QC500_231215	HDPE (no PTFE)	20 mL	00350522025969	Grey	No	
008	1200_SW001_231012	HDPE (no PTFE)	20 mL	00351221011632	Grey	No	
008	1200_SW001_231012	HDPE (no PTFE)	20 mL	00351221011884	Grey	No	
009	1200_SW007_231215	HDPE (no PTFE)	20 mL	00350719054593	Grey	No	
009	1200_SW007_231215	HDPE (no PTFE)	20 mL	00352309065435	Grey	No	
009	1200_SW007_231215	HDPE (no PTFE)	20 mL	00352309065627	Grey	No	
010	1200_SW023_231215	HDPE (no PTFE)	20 mL	00350719054563	Grey	No	
010	1200_SW023_231215	HDPE (no PTFE)	20 mL	00352309065626	Grey	No	
010	1200_SW023_231215	HDPE (no PTFE)	20 mL	00352309065495	Grey	No	
011	1200_SW059_231215	HDPE (no PTFE)	20 mL	00350719054575	Grey	No	
011	1200_SW059_231215	HDPE (no PTFE)	20 mL	00350822057979	Grey	No	
011	1200_SW059_231215	HDPE (no PTFE)	20 mL	00350822058049	Grey	No	

CHAIN OF CUSTODY

COC#: 61425 *ALS Laboratory:* ES Sydney Environmental

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	[redacted] DATE TIME: 19/12/23 0830

CLIENT: [redacted]

PROJECT: NT_1200_PFASOMP_23

SITE: Robertson Barracks - OMP SW

ORDER NO: 60612561/2.1

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH:

QUOTE NO: SY/139/19 V3

SAMPLER MOBILE:

/ ES2019AECOMAU003 0

EMAIL REPORTS TO: [redacted]

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

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

Random Sample Temperature on Receipt: °C

Other comments:

012	1200_QC100_231215	HDPE (no PTFE)	20 mL	00350822058007	Grey	No	
012	1200_QC100_231215	HDPE (no PTFE)	20 mL	00350522025909	Grey	No	
013	1200_QC200_231215	HDPE (no PTFE)	20 mL	00350522025823	Grey	No	
013	1200_QC200_231215	HDPE (no PTFE)	20 mL	00350522025871	Grey	No	
014	1200_QC300_231211	HDPE (no PTFE)	20 mL	00352309065465	Grey	No	
014	1200_QC300_231211	HDPE (no PTFE)	20 mL	00352309065570	Grey	No	
015	1200_QC400_231211	HDPE (no PTFE)	20 mL	00352309065519	Grey	No	
015	1200_QC400_231211	HDPE (no PTFE)	20 mL	00352309065490	Grey	No	

Total Bottle Count: ALS: 34, Non ALS: 0

[redacted]

From: [redacted]
Sent:
To:
Cc:
Subject:

OFFICIAL

CAUTION - This email originated from outside of the organisation. Do not click links or open attachments unless you recognise the sender and know the content is safe.

Hi [redacted]

For the first workorder W/O ES2343723- extra sample 1200_QC200_231211, if you only received 2 sets of bottles, the one that is written 1200_QC200_231211 on the bottle is the correspondent to the sample -004 on the COC, the end number was written in incorrectly. Please analyse the sample for PFAS for both samples as requested by [redacted]

Thanks for your help! Please let me know if you need any additional information.

Kind regards

[redacted]

CHAIN OF CUSTODY

(ALS) COC#: 64642 ALS Laboratory: ES Sydney Environmental

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	[redacted]
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME: 14/3/24 0830

CLIENT: [redacted]

PROJECT: NT_1200_PFASOMP_24

SITE: Robertson Barracks

ORDER NO: 60612561/2.2

PROJECT MANAGER: [redacted]
PRIMARY SAMPLER:

CONTACT PH:
QUOTE NO: SY/139/19 V3

SAMPLER MOBILE:
/ ES2019AECOMAU003 0

EMAIL REPORTS TO: [redacted]

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact?	Yes	No	N/A
Free ice / frozen ice bricks present upon receipt?	Yes	No	N/A
Random Sample Temperature on Receipt:		°C	
Other comments:			

SAMPLE DETAILS							ANALYSIS REQUIRED						
SAMPLE	NAME	DESCRIPTION	DATE / TIME	MATRIX	TOTAL BOTTLES	ON HOLD	Biota BIOTA	Ground Waters - Saline WATER	PFAS Waters WATER	Surface Waters - Saline WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
001	1200_MW001_240306		11/03/2024 11:08 AM	WATER	ALS: 2 Non ALS: 0	No			X	Partial 1/7		
002	1200_MW004_240305		05/03/2024 03:21 PM	WATER	ALS: 2 Non ALS: 0	No		Partial 1/5	X			
003	1200_MW004D_240305		05/03/2024 03:38 PM	WATER	ALS: 2 Non ALS: 0	No			X			
004	1200_MW012_240312		12/03/2024 12:32 PM	WATER	ALS: 0 Non ALS: 0	No			X			
005	1200_MW018_240301		01/03/2024 11:40 AM	WATER	ALS: 2 Non ALS: 0	No			X			
006	1200_MW021_240301	Extra vol for lab QC	01/03/2024 11:42 AM	WATER	ALS: 3 Non ALS: 0	No			X			
007	1200_MW021D_240301		01/03/2024 11:43 AM	WATER	ALS: 2 Non ALS: 0	No			X			

Environmental Division
Sydney
Work Order Reference
ES2408291

Telephone : +61-2-8784 6555

Subcon / Courier / Lab / Split WO
Lab / Analysis: ALS Townsville NM
Organised By / Date:
Relinquished By / Date:
Courier / Courier: QC Fwd
WO No: ES2408291
Attach by BO / Internal Order

CHAIN OF CUSTODY

ALS COC#: 64642 ALS Laboratory: ES Sydney Environmental

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

CLIENT: [redacted]

PROJECT: NT_1200_PFASOMP_24

SITE: Robertson Barracks

ORDER NO: 60612561/2.2

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH:

QUOTE NO: SY/139/19 V3

SAMPLER MOBILE:

/ ES2019AECOMAU003 0

EMAIL REPORTS TO: [redacted]

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact?	Yes	No	N/A
Free ice / frozen ice bricks present upon receipt?	Yes	No	N/A
Random Sample Temperature on Receipt:		°C	
Other comments:			

SAMPLE DETAILS							ANALYSIS REQUIRED					
SAMPLE	NAME	DESCRIPTION	DATE / TIME	MATRIX	TOTAL BOTTLES	ON HOLD	Biota BIOTA	Ground Waters - Saline WATER	PFAS Waters WATER	Surface Waters - Saline WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
008	1200_MW023_240301		01/03/2024 11:41 AM	WATER	ALS: 2 Non ALS: 0	No			X			
009	1200_MW029_240308		08/03/2024 11:36 AM	WATER	ALS: 2 Non ALS: 0	No	X		X			
010	1200_MW030_240308		08/03/2024 11:07 AM	WATER	ALS: 2 Non ALS: 0	No			X			
011	1200_MW031_240308		08/03/2024 11:08 AM	WATER	ALS: 2 Non ALS: 0	No			X			
012	1200_MW032_240307		11/03/2024 11:05 AM	WATER	ALS: 2 Non ALS: 0	No			X			
013	1200_MW034_240312		12/03/2024 04:45 PM	WATER	ALS: 0 Non ALS: 0	No			X			
014	1200_MW066_240307			WATER	ALS: 0 Non ALS: 0	No			X			

CHAIN OF CUSTODY

ALS COC#: 64642 ALS Laboratory: ES Sydney Environmental

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

CLIENT: [redacted]

PROJECT: NT_1200_PFASOMP_24

SITE: Robertson Barracks

ORDER NO: 60612561/2.2

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER:

CONTACT PH:

QUOTE NO: SY/139/19 V3

SAMPLER MOBILE:

/ ES2019AECOMAU003 0

EMAIL REPORTS TO: [redacted]

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

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

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE DETAILS							ANALYSIS REQUIRED					
SAMPLE	NAME	DESCRIPTION	DATE / TIME	MATRIX	TOTAL BOTTLES	ON HOLD	Biota BIOTA	Ground Waters - Saline WATER	PFAS Waters WATER	Surface Waters - Saline WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
015	1200_MW080_240305		05/03/2024 04:23 PM	WATER	ALS: 2 Non ALS: 0	No			X			
016	1200_MW112_240305		05/03/2024 02:59 PM	WATER	ALS: 2 Non ALS: 0	No			X			
017	1200_MW113_240305		05/03/2024 02:59 PM	WATER	ALS: 2 Non ALS: 0	No			X			
018	1200_QC100_240305		05/03/2024 03:38 PM	WATER	ALS: 2 Non ALS: 0	No			X			
~~019~~	1200_QC200_240305		05/03/2024 03:39 PM	WATER	ALS: 2 Non ALS: 0	No			X			
020	1200_QC300_240301			WATER	ALS: 0 Non ALS: 0	No			X			
021	1200_QC400_240301			WATER	ALS: 0 Non ALS: 0	No			X			

CHAIN OF CUSTODY

COC#: 64642 *ALS Laboratory:* ES Sydney Environmental

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

CLIENT: [redacted]

PROJECT: NT_1200_PFASOMP_24

SITE: Robertson Barracks

ORDER NO: 60612561/2.2

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER:

CONTACT PH:

QUOTE NO: SY/139/19 V3

SAMPLER MOBILE:

/ ES2019AECOMAU003 0

EMAIL REPORTS TO: [redacted]

LABORATORY USE ONLY (Circle)

Custody Seal intact?	Yes	No	N/A
Free ice / frozen ice bricks present upon receipt?	Yes	No	N/A
Random Sample Temperature on Receipt:		°C	
Other comments:			

SAMPLE DETAILS							ANALYSIS REQUIRED					
SAMPLE	NAME	DESCRIPTION	DATE / TIME	MATRIX	TOTAL BOTTLES	ON HOLD	Biota BIOTA	Ground Waters - Saline WATER	PFAS Waters WATER	Surface Waters - Saline WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
022	1200_QC500_240301			WATER	ALS: 0 Non ALS: 0	No			X			
023	1200_QC101_240312		07/03/2024 09:54 AM	WATER	ALS: 0 Non ALS: 0	No			X			
~~024~~	1200_QC201_240312		12/03/2024 09:55 AM	WATER	ALS: 0 Non ALS: 0	No			X			
025	1200_QC301_240305			WATER	ALS: 0 Non ALS: 0	No			X			
026	1200_QC401_240305			WATER	ALS: 0 Non ALS: 0	No			X			
027	1200_SW023_240305		05/03/2024 05:39 PM	WATER	ALS: 3 Non ALS: 0	No			X			
028	1200_SW028_240305		05/03/2024 06:16 PM	WATER	ALS: 2 Non ALS: 0	No			X			

CHAIN OF CUSTODY

(ALS) COC#: 64642 ALS Laboratory: ES Sydney Environmental

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

CLIENT: [redacted]

PROJECT: NT_1200_PFASOMP_24

SITE: Robertson Barracks

ORDER NO: 60612561/2.2

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH:

QUOTE NO: SY/139/19 V3

SAMPLER MOBILE:

/ ES2019AECOMAU003 0

EMAIL REPORTS TO: [redacted]

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

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

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE DETAILS							ANALYSIS REQUIRED					
SAMPLE	NAME	DESCRIPTION	DATE / TIME	MATRIX	TOTAL BOTTLES	ON HOLD	Biota BIOTA	Ground Waters - Saline WATER	PFAS Waters WATER	Surface Waters - Saline WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
029	1200_SW007_240306		06/03/2024 10:04 AM	WATER	ALS: 2 Non ALS: 0	No			X			
030	1200_SW059_240307		07/03/2024 09:54 AM	WATER	ALS: 2 Non ALS: 0	No			X	Partial 1/7		
031	1200_QC302_240306			WATER	ALS: 0 Non ALS: 0	No			X			
032	1200_QC402_240306			WATER	ALS: 0 Non ALS: 0	No			X			
033	1200_QC303_240307			WATER	ALS: 0 Non ALS: 0	No			X			
034	1200_QC403_240307			WATER	ALS: 0 Non ALS: 0	No			X			
035	1200_SW123_240301		01/03/2024 11:46 AM	WATER	ALS: 2 Non ALS: 0	No			X			

CHAIN OF CUSTODY

COC#: 64642 ALS Laboratory: ES Sydney Environmental

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

CLIENT: [redacted]

PROJECT: NT_1200_PFASOMP_24

SITE: Robertson Barracks

ORDER NO: 60612561/2.2

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER:

CONTACT PH:

QUOTE NO: SY/139/19 V3

SAMPLER MOBILE:

/ ES2019AECOMAU003 0

EMAIL REPORTS TO: [redacted]

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact?	Yes	No	N/A
Free ice / frozen ice bricks present upon receipt?	Yes	No	N/A
Random Sample Temperature on Receipt:		°C	
Other comments:			

SAMPLE DETAILS							ANALYSIS REQUIRED					
SAMPLE	NAME	DESCRIPTION	DATE / TIME	MATRIX	TOTAL BOTTLES	ON HOLD	Biota BIOTA	Ground Waters - Saline WATER	PFAS Waters WATER	Surface Waters - Saline WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
036	1200_SW086_240301		01/03/2024 11:47 AM	WATER	ALS: 2 Non ALS: 0	No			X			
037	1200_SW091_240301		01/03/2024 11:48 AM	WATER	ALS: 3 Non ALS: 0	No			X			
038	1200_MW012D_240312		12/03/2024 12:33 PM	WATER	ALS: 0 Non ALS: 0	No			X			

CHAIN OF CUSTODY

COC#: 64642 *ALS Laboratory:* ES Sydney Environmental

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

CLIENT: [redacted]

PROJECT: NT_1200_PFASOMP_24

SITE: Robertson Barracks

ORDER NO: 60612561/2.2

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

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

Random Sample Temperature on Receipt: °C

Other comments:

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER:

CONTACT PH:

QUOTE NO: SY/139/19 V3

SAMPLER MOBILE:

/ ES2019AECOMAU003 0

EMAIL REPORTS TO: [redacted]

SAMPLE	SAMPLE NAME	PARTIAL ANALYSIS GROUP NAME	MATRIX	SELECTED ANALYSIS NAME
001	1200_MW001_240306	Surface Waters - Saline WATER	WATER	- EP231X PFAS - Full Suite (28 analytes)
002	1200_MW004_240305	Ground Waters - Saline WATER	WATER	- EP231X PFAS - Full Suite (28 analytes)
030	1200_SW059_240307	Surface Waters - Saline WATER	WATER	- EP231X PFAS - Full Suite (28 analytes)

CHAIN OF CUSTODY

(ALS) COC#: 64642 *ALS Laboratory:* ES Sydney Environmental

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

CLIENT: [redacted]

PROJECT: NT_1200_PFASOMP_24

SITE: Robertson Barracks

ORDER NO: 60612561/2.2

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER:

CONTACT PH:

QUOTE NO: SY/139/19 V3

SAMPLER MOBILE:

/ ES2019AECOMAU003 0

EMAIL REPORTS TO: [redacted]

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

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

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE	SAMPLE NAME	BOTTLE NAME	VOLUME	BARCODE	TYPE	FILTERED	REASON
001	1200_MW001_240306	HDPE (no PTFE)	20 mL	00352309081812	Grey	No	
001	1200_MW001_240306	HDPE (no PTFE)	20 mL	00352309081917	Grey	No	
002	1200_MW004_240305	HDPE (no PTFE)	20 mL	00352309081894	Grey	No	
002	1200_MW004_240305	HDPE (no PTFE)	20 mL	00352309075345	Grey	No	
003	1200_MW004D_240305	HDPE (no PTFE)	20 mL	00352309075253	Grey	No	
003	1200_MW004D_240305	HDPE (no PTFE)	20 mL	00352309075236	Grey	No	
005	1200_MW018_240301	HDPE (no PTFE)	20 mL	00352309081958	Grey	No	
005	1200_MW018_240301	HDPE (no PTFE)	20 mL	00352309075245	Grey	No	
006	1200_MW021_240301	HDPE (no PTFE)	20 mL	00352309075465	Grey	No	
006	1200_MW021_240301	HDPE (no PTFE)	20 mL	00352309075387	Grey	No	
006	1200_MW021_240301	HDPE (no PTFE)	20 mL	00350719054665	Grey	No	
007	1200_MW021D_240301	HDPE (no PTFE)	20 mL	00352309081957	Grey	No	
007	1200_MW021D_240301	HDPE (no PTFE)	20 mL	00352309081807	Grey	No	
008	1200_MW023_240301	HDPE (no PTFE)	20 mL	00352309075197	Grey	No	
008	1200_MW023_240301	HDPE (no PTFE)	20 mL	00352309081923	Grey	No	
009	1200_MW029_240308	HDPE (no PTFE)	20 mL	00352309081808	Grey	No	
009	1200_MW029_240308	HDPE (no PTFE)	20 mL	00352309081887	Grey	No	
010	1200_MW030_240308	HDPE (no PTFE)	20 mL	00352309081860	Grey	No	
010	1200_MW030_240308	HDPE (no PTFE)	20 mL	00352309081831	Grey	No	
011	1200_MW031_240308	HDPE (no PTFE)	20 mL	00352309081832	Grey	No	
011	1200_MW031_240308	HDPE (no PTFE)	20 mL	00352309075212	Grey	No	
012	1200_MW032_240307	HDPE (no PTFE)	20 mL	00352309081892	Grey	No	
012	1200_MW032_240307	HDPE (no PTFE)	20 mL	00352309081932	Grey	No	
015	1200_MW080_240305	HDPE (no PTFE)	20 mL	00352309081921	Grey	No	
015	1200_MW080_240305	HDPE (no PTFE)	20 mL	00352309081855	Grey	No	
016	1200_MW112_240305	HDPE (no PTFE)	20 mL	00352309075399	Grey	No	

CHAIN OF CUSTODY

COC#: 64642 *ALS Laboratory:* ES Sydney Environmental

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	[redacted] 14/3/24 0830

CLIENT: [redacted]

PROJECT: NT_1200_PFASOMP_24

SITE: Robertson Barracks

ORDER NO: 60612561/2.2

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact?	Yes	No	N/A
Free ice / frozen ice bricks present upon receipt?	Yes	No	N/A
Random Sample Temperature on Receipt:		°C	
Other comments:			

PROJECT MANAGER: [redacted]
PRIMARY SAMPLER:

CONTACT PH:
QUOTE NO: SY/139/19 V3

SAMPLER MOBILE:
/ ES2019AECOMAU003 0

EMAIL REPORTS TO: [redacted]

016	1200_MW112_240305	HDPE (no PTFE)	20 mL	00352309081849	Grey	No	
017	1200_MW113_240305	HDPE (no PTFE)	20 mL	00352309081838	Grey	No	
017	1200_MW113_240305	HDPE (no PTFE)	20 mL	00352309081878	Grey	No	
018	1200_QC100_240305	HDPE (no PTFE)	20 mL	00352309075223	Grey	No	
018	1200_QC100_240305	HDPE (no PTFE)	20 mL	00352309081907	Grey	No	
019	1200_QC200_240305	HDPE (no PTFE)	20 mL	00352309081837	Grey	No	
019	1200_QC200_240305	HDPE (no PTFE)	20 mL	00352309075207	Grey	No	
027	1200_SW023_240305	HDPE (no PTFE)	20 mL	00350719054772	Grey	No	
027	1200_SW023_240305	HDPE (no PTFE)	20 mL	00352309075449	Grey	No	
027	1200_SW023_240305	HDPE (no PTFE)	20 mL	00352309081952	Grey	No	
028	1200_SW028_240305	HDPE (no PTFE)	20 mL	00352309075363	Grey	No	
028	1200_SW028_240305	HDPE (no PTFE)	20 mL	00352309081908	Grey	No	
029	1200_SW007_240306	HDPE (no PTFE)	20 mL	00352309081847	Grey	No	
029	1200_SW007_240306	HDPE (no PTFE)	20 mL	00352309081853	Grey	No	
030	1200_SW059_240307	HDPE (no PTFE)	20 mL	00352309075457	Grey	No	
030	1200_SW059_240307	HDPE (no PTFE)	20 mL	00352309075391	Grey	No	
035	1200_SW123_240301	HDPE (no PTFE)	20 mL	00352309075290	Grey	No	
035	1200_SW123_240301	HDPE (no PTFE)	20 mL	00352309075373	Grey	No	
036	1200_SW086_240301	HDPE (no PTFE)	20 mL	00352309075327	Grey	No	
036	1200_SW086_240301	HDPE (no PTFE)	20 mL	00352309081870	Grey	No	
037	1200_SW091_240301	HDPE (no PTFE)	20 mL	00352309081806	Grey	No	
037	1200_SW091_240301	HDPE (no PTFE)	20 mL	00352309075289	Grey	No	
037	1200_SW091_240301	HDPE (no PTFE)	20 mL	00350719054761	Grey	No	

Total Bottle Count: ALS: 49, Non ALS: 0

CHAIN OF CUSTODY

COC#: 64642 ALS Laboratory: ES Sydney Environmental

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

CLIENT: [redacted]

PROJECT: NT_1200_PFASOMP_24

SITE: Robertson Barracks

ORDER NO: 60612561/2.2

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER:

EMAIL REPORTS TO: [redacted]

CONTACT PH:

QUOTE NO: SY/139/19 V3

SAMPLER MOBILE:

TURNAROUND REQUIREMENTS: 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

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

Random Sample Temperature on Receipt: °C

Other comments: / ES2019AECOMAU0030

AECOO6/240315

DUE: 22/3/24 AR

SAMPLE DETAILS							ANALYSIS REQUIRED					
SAMPLE	NAME	DESCRIPTION	DATE / TIME	MATRIX	TOTAL BOTTLES	ON HOLD	Biota BIOTA	Ground Waters - Saline WATER	PFAS Waters WATER	Surface Waters - Saline WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
015	1200_MW080_240305		05/03/2024 04:23 PM	WATER	ALS: 2 Non ALS: 0	No			X			
016	1200_MW112_240305		05/03/2024 02:59 PM	WATER	ALS: 2 Non ALS: 0	No			X			
017	1200_MW113_240305		05/03/2024 02:59 PM	WATER	ALS: 2 Non ALS: 0	No			X			
018	1200_QC100_240305		05/03/2024 03:38 PM	WATER	ALS: 2 Non ALS: 0	No			X			
~~019~~	1200_QC200_240305		05/03/2024 03:39 PM	WATER	ALS: 2 Non ALS: 0	No			X		N24/005696	
020	1200_QC300_240301			WATER	ALS: 0 Non ALS: 0	No			X			
021	1200_QC400_240301			WATER	ALS: 0 Non ALS: 0	No			X			

CHAIN OF CUSTODY

COC#: 64642 ALS Laboratory: ES Sydney Environmental

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

CLIENT: [redacted]

PROJECT: NT_1200_PFASOMP_24

SITE: Robertson Barracks

ORDER NO: 60612561/2.2

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH:

QUOTE NO: SY/139/19 V3

SAMPLER MOBILE:

/ ES2019AECOMAU003 0

EMAIL REPORTS TO: [redacted]

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

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

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE DETAILS							ANALYSIS REQUIRED					
SAMPLE	NAME	DESCRIPTION	DATE / TIME	MATRIX	TOTAL BOTTLES	ON HOLD	Biota BIOTA	Ground Waters - Saline WATER	PFAS Waters WATER	Surface Waters - Saline WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
022	1200_QC500_240301			WATER	ALS: 0 Non ALS: 0	No			X			
023	1200_QC101_240312		07/03/2024 09:54 AM	WATER	ALS: 0 Non ALS: 0	No			X			
~~024~~	1200_QC201_240312		12/03/2024 09:55 AM	WATER	ALS: 0 Non ALS: 0	No			X		N24/005697	
025	1200_QC301_240305			WATER	ALS: 0 Non ALS: 0	No			X			
026	1200_QC401_240305			WATER	ALS: 0 Non ALS: 0	No			X			
027	1200_SW023_240305		05/03/2024 05:39 PM	WATER	ALS: 3 Non ALS: 0	No			X			
028	1200_SW028_240305		05/03/2024 06:16 PM	WATER	ALS: 2 Non ALS: 0	No			X			

CHAIN OF CUSTODY

COC#: 64642 ALS Laboratory: ES Sydney Environmental

CLIENT: [redacted]

PROJECT: NT_1200_PFASOMP_24

SITE: Robertson Barracks

ORDER NO: 60612561/2.2

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH:

QUOTE NO: SY/139/19 V3

SAMPLER MOBILE: / ES2019AECOMAU0030

EMAIL REPORTS TO: [redacted]

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	[redacted]
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME: 14/3/24 0830

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

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

Random Sample Temperature on Receipt: °C

Other comments:

15 MAR 2024 14:50

15 MAR 2024 14:50

Environmental Division Sydney

Work Order Reference ES2408291

Telephone : +61-2-8784 8555

SAMPLE DETAILS							ANALYSIS REQUIRED						
SAMPLE	NAME	DESCRIPTION	DATE / TIME	MATRIX	TOTAL BOTTLES	ON HOLD	Biota BIOTA	Ground Waters - Saline WATER	PFAS Waters WATER	Surface Waters - Saline WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
001	1200_MW001_240306		11/03/2024 11:08 AM	WATER	ALS: 2 Non ALS: 0	No			X	Partial 1/7		
002	1200_MW004_240305		05/03/2024 03:21 PM	WATER	ALS: 2 Non ALS: 0	No		Partial 1/5	X			
003	1200_MW004D_240305		05/03/2024 03:38 PM	WATER	ALS: 2 Non ALS: 0	No			X			
004	1200_MW012_240312		12/03/2024 12:32 PM	WATER	ALS: 0 Non ALS: 0	No			X			
005	1200_MW018_240301		01/03/2024 11:40 AM	WATER	ALS: 2 Non ALS: 0	No			X			
006	1200_MW021_240301	Extra vol for lab QC	01/03/2024 11:42 AM	WATER	ALS: 3 Non ALS: 0	No			X			
007	1200_MW021D_240301		01/03/2024 11:43 AM	WATER	ALS: 2 Non ALS: 0	No			X			

Subcon / Forward Lab / Split WO

Lab / Analysis: ALS Canberra NM

Organised By / Date:

Relinquished By / Date:

Courier: QC FWD

WO No: ES2408291

Attach By PO / Internal Sheet:

Wednesday, March 13, 2024 11:40:16 PM

CHAIN OF CUSTODY

COC#: 64642 ALS Laboratory: ES Sydney Environmental

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

CLIENT: [redacted]

PROJECT: NT_1200_PFASOMP_24

SITE: Robertson Barracks

ORDER NO: 60612561/2.2

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH:

QUOTE NO: SY/139/19 V3

SAMPLER MOBILE:

/ ES2019AECOMAU003 0

EMAIL REPORTS TO: [redacted]

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

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

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE DETAILS							ANALYSIS REQUIRED						
SAMPLE	NAME	DESCRIPTION	DATE / TIME	MATRIX	TOTAL BOTTLES	ON HOLD	Biota BIOTA	Ground Waters - Saline WATER	PFAS Waters WATER	Surface Waters - Saline WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
029	1200_SW007_240306		06/03/2024 10:04 AM	WATER	ALS: 2 Non ALS: 0	No			X			
030	1200_SW059_240307		07/03/2024 09:54 AM	WATER	ALS: 2 Non ALS: 0	No			X	Partial 1/7		
031	1200_QC302_240306			WATER	ALS: 0 Non ALS: 0	No			X			
032	1200_QC402_240306			WATER	ALS: 0 Non ALS: 0	No			X			
033	1200_QC303_240307			WATER	ALS: 0 Non ALS: 0	No			X			
034	1200_QC403_240307			WATER	ALS: 0 Non ALS: 0	No			X			
035	1200_SW123_240301		01/03/2024 11:46 AM	WATER	ALS: 2 Non ALS: 0	No			X			

CHAIN OF CUSTODY

COC#: 64642 *ALS Laboratory:* ES Sydney Environmental

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

CLIENT: [redacted]

PROJECT: NT_1200_PFASOMP_24

SITE: Robertson Barracks

ORDER NO: 60612561/2.2

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH:

QUOTE NO: SY/139/19 V3

SAMPLER MOBILE:

/ ES2019AECOMAU003 0

EMAIL REPORTS TO: [redacted]

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

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

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE DETAILS							ANALYSIS REQUIRED					
SAMPLE	NAME	DESCRIPTION	DATE / TIME	MATRIX	TOTAL BOTTLES	ON HOLD	Biota BIOTA	Ground Waters - Saline WATER	PFAS Waters WATER	Surface Waters - Saline WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
036	1200_SW086_240301		01/03/2024 11:47 AM	WATER	ALS: 2 Non ALS: 0	No			X			
037	1200_SW091_240301		01/03/2024 11:48 AM	WATER	ALS: 3 Non ALS: 0	No			X			
038	1200_MW012D_240312		12/03/2024 12:33 PM	WATER	ALS: 0 Non ALS: 0	No			X			

CHAIN OF CUSTODY

COC#: 64642 ALS Laboratory: ES Sydney Environmental

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

CLIENT: [redacted]

PROJECT: NT_1200_PFASOMP_24

SITE: Robertson Barracks

ORDER NO: 60612561/2.2

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER:

CONTACT PH:

QUOTE NO: SY/139/19 V3

SAMPLER MOBILE:

/ ES2019AECOMAU0030

EMAIL REPORTS TO: [redacted]

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

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

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE	SAMPLE NAME	PARTIAL ANALYSIS GROUP NAME	MATRIX	SELECTED ANALYSIS NAME
001	1200_MW001_240306	Surface Waters - Saline WATER	WATER	- EP231X PFAS - Full Suite (28 analytes)
002	1200_MW004_240305	Ground Waters - Saline WATER	WATER	- EP231X PFAS - Full Suite (28 analytes)
030	1200_SW059_240307	Surface Waters - Saline WATER	WATER	- EP231X PFAS - Full Suite (28 analytes)

CHAIN OF CUSTODY

COC#: 64642 ALS Laboratory: ES Sydney Environmental

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

CLIENT: [redacted]

PROJECT: NT_1200_PFASOMP_24

SITE: Robertson Barracks

ORDER NO: 60612561/2.2

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH:

QUOTE NO: SY/139/19 V3

SAMPLER MOBILE:

/ ES2019AECOMAU0030

EMAIL REPORTS TO: [redacted]

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

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

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE	SAMPLE NAME	BOTTLE NAME	VOLUME	BARCODE	TYPE	FILTERED	REASON
001	1200_MW001_240306	HDPE (no PTFE)	20 mL	00352309081812	Grey	No	
001	1200_MW001_240306	HDPE (no PTFE)	20 mL	00352309081917	Grey	No	
002	1200_MW004_240305	HDPE (no PTFE)	20 mL	00352309081894	Grey	No	
002	1200_MW004_240305	HDPE (no PTFE)	20 mL	00352309075345	Grey	No	
003	1200_MW004D_240305	HDPE (no PTFE)	20 mL	00352309075253	Grey	No	
003	1200_MW004D_240305	HDPE (no PTFE)	20 mL	00352309075236	Grey	No	
005	1200_MW018_240301	HDPE (no PTFE)	20 mL	00352309081958	Grey	No	
005	1200_MW018_240301	HDPE (no PTFE)	20 mL	00352309075245	Grey	No	
006	1200_MW021_240301	HDPE (no PTFE)	20 mL	00352309075465	Grey	No	
006	1200_MW021_240301	HDPE (no PTFE)	20 mL	00352309075387	Grey	No	
006	1200_MW021_240301	HDPE (no PTFE)	20 mL	00350719054665	Grey	No	
007	1200_MW021D_240301	HDPE (no PTFE)	20 mL	00352309081957	Grey	No	
007	1200_MW021D_240301	HDPE (no PTFE)	20 mL	00352309081807	Grey	No	
008	1200_MW023_240301	HDPE (no PTFE)	20 mL	00352309075197	Grey	No	
008	1200_MW023_240301	HDPE (no PTFE)	20 mL	00352309081923	Grey	No	
009	1200_MW029_240308	HDPE (no PTFE)	20 mL	00352309081808	Grey	No	
009	1200_MW029_240308	HDPE (no PTFE)	20 mL	00352309081887	Grey	No	
010	1200_MW030_240308	HDPE (no PTFE)	20 mL	00352309081860	Grey	No	
010	1200_MW030_240308	HDPE (no PTFE)	20 mL	00352309081831	Grey	No	
011	1200_MW031_240308	HDPE (no PTFE)	20 mL	00352309081832	Grey	No	
011	1200_MW031_240308	HDPE (no PTFE)	20 mL	00352309075212	Grey	No	
012	1200_MW032_240307	HDPE (no PTFE)	20 mL	00352309081892	Grey	No	
012	1200_MW032_240307	HDPE (no PTFE)	20 mL	00352309081932	Grey	No	
015	1200_MW080_240305	HDPE (no PTFE)	20 mL	00352309081921	Grey	No	
015	1200_MW080_240305	HDPE (no PTFE)	20 mL	00352309081855	Grey	No	
016	1200_MW112_240305	HDPE (no PTFE)	20 mL	00352309075399	Grey	No	

CHAIN OF CUSTODY

COC#: 64642 *ALS Laboratory:* ES Sydney Environmental

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	R[redacted]
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME: 14/3/24 0830

CLIENT: [redacted]

PROJECT: NT_1200_PFASOMP_24

SITE: Robertson Barracks

ORDER NO: 60612561/2.2

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: SAMPLER MOBILE:

QUOTE NO: SY/139/19 V3 / ES2019AECOMAU0030

EMAIL REPORTS TO: [redacted]

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

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

Random Sample Temperature on Receipt: °C

Other comments:

016	1200_MW112_240305	HDPE (no PTFE)	20 mL	00352309081849	Grey	No	
017	1200_MW113_240305	HDPE (no PTFE)	20 mL	00352309081838	Grey	No	
017	1200_MW113_240305	HDPE (no PTFE)	20 mL	00352309081878	Grey	No	
018	1200_QC100_240305	HDPE (no PTFE)	20 mL	00352309075223	Grey	No	
018	1200_QC100_240305	HDPE (no PTFE)	20 mL	00352309081907	Grey	No	
019	1200_QC200_240305	HDPE (no PTFE)	20 mL	00352309081837	Grey	No	
019	1200_QC200_240305	HDPE (no PTFE)	20 mL	00352309075207	Grey	No	
027	1200_SW023_240305	HDPE (no PTFE)	20 mL	00350719054772	Grey	No	
027	1200_SW023_240305	HDPE (no PTFE)	20 mL	00352309075449	Grey	No	
027	1200_SW023_240305	HDPE (no PTFE)	20 mL	00352309081952	Grey	No	
028	1200_SW028_240305	HDPE (no PTFE)	20 mL	00352309075363	Grey	No	
028	1200_SW028_240305	HDPE (no PTFE)	20 mL	00352309081908	Grey	No	
029	1200_SW007_240306	HDPE (no PTFE)	20 mL	00352309081847	Grey	No	
029	1200_SW007_240306	HDPE (no PTFE)	20 mL	00352309081853	Grey	No	
030	1200_SW059_240307	HDPE (no PTFE)	20 mL	00352309075457	Grey	No	
030	1200_SW059_240307	HDPE (no PTFE)	20 mL	00352309075391	Grey	No	
035	1200_SW123_240301	HDPE (no PTFE)	20 mL	00352309075290	Grey	No	
035	1200_SW123_240301	HDPE (no PTFE)	20 mL	00352309075373	Grey	No	
036	1200_SW086_240301	HDPE (no PTFE)	20 mL	00352309075327	Grey	No	
036	1200_SW086_240301	HDPE (no PTFE)	20 mL	00352309081870	Grey	No	
037	1200_SW091_240301	HDPE (no PTFE)	20 mL	00352309081806	Grey	No	
037	1200_SW091_240301	HDPE (no PTFE)	20 mL	00352309075289	Grey	No	
037	1200_SW091_240301	HDPE (no PTFE)	20 mL	00350719054761	Grey	No	

Total Bottle Count: ALS: 49, Non ALS: 0

CHAIN OF CUSTODY

COC#: 64642 ALS Laboratory: ES Sydney Environmental

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

CLIENT: [redacted]

PROJECT: NT_1200_PFASOMP_24

SITE: Robertson Barracks

ORDER NO: 60612561/2.2

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH:

QUOTE NO: SY/139/19 V3

SAMPLER MOBILE:

/ ES2019AECOMAU003 0

EMAIL REPORTS TO: [redacted]

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

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

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE DETAILS							ANALYSIS REQUIRED					
SAMPLE	NAME	DESCRIPTION	DATE / TIME	MATRIX	TOTAL BOTTLES	ON HOLD	Biota BIOTA	Ground Waters - Saline WATER	PFAS Waters WATER	Surface Waters - Saline WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
008	1200_MW023_240301		01/03/2024 11:41 AM	WATER	ALS: 2 Non ALS: 0	No			X			
009	1200_MW029_240308		08/03/2024 11:36 AM	WATER	ALS: 2 Non ALS: 0	No	X		X			
010	1200_MW030_240308		08/03/2024 11:07 AM	WATER	ALS: 2 Non ALS: 0	No			X			
011	1200_MW031_240308		08/03/2024 11:08 AM	WATER	ALS: 2 Non ALS: 0	No			X			
012	1200_MW032_240307		11/03/2024 11:05 AM	WATER	ALS: 2 Non ALS: 0	No			X			
013	1200_MW034_240312		12/03/2024 04:45 PM	WATER	ALS: 0 Non ALS: 0	No			X			
014	1200_MW066_240307			WATER	ALS: 0 Non ALS: 0	No			X			

Appendix F

Lab Reports

SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order	: **ES2341145**		
Amendment	: **1**		
Client	: [redacted]	Laboratory	: Environmental Division Sydney
Contact	: [redacted]	Contact	: [redacted]
Address	: [redacted]	Address	: [redacted]
E-mail	: [redacted]	E-mail	: [redacted]
Telephone	: ----	Telephone	: [redacted]
Facsimile	: ----	Facsimile	: [redacted]
Project	: NT_1200_PFASOMP_23	Page	: 1 of 3
Order number	: 60612561/2.1	Quote number	: ES2019AECOMAU0030 (SY/139/19 V3)
C-O-C number	: ----	QC Level	: NEPM 2013 B3 & ALS QC Standard
Site	: ----		
Sampler	: [redacted]		

Dates

Date Samples Received	: 29-Nov-2023 15:30	Issue Date	: 08-Dec-2023
Client Requested Due Date	: 12-Dec-2023	Scheduled Reporting Date	: **12-Dec-2023**

Delivery Details

Mode of Delivery	: Client Drop Off	Security Seal	: Not Available
No. of coolers/boxes	: ----	Temperature	: 30.5'C
Receipt Detail	:	No. of samples received / analysed	: 8 / 8
		No. of samples NOT collected	3

General Comments

- This report contains the following information:
  - Sample Container(s)/Preservation Non-Compliances
  - Summary of Sample(s) and Requested Analysis
  - Proactive Holding Time Report
  - Requested Deliverables
- **Please refer to the Proactive Holding Time Report table below which summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory. The laboratory will process these samples unless instructions are received from you indicating you do not wish to proceed. The absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.**
- Sample 1200_SW086_231128 was not received due to the following reason: Sample not received
- Sample 1200_SW123_231128 was not received due to the following reason: Sample not received
- Sample 1200_SW091_231128 was not received due to the following reason: Sample not received
- Please direct any queries you have regarding this work order to the above ALS laboratory contact.
- Analytical work for this work order will be conducted at ALS Sydney.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months ± 1 week) from receipt of samples.
- Please be aware that APHA/NEPM recommends water and soil samples be chilled to less than or equal to 6°C for chemical analysis, and less than or equal to 10°C but unfrozen for Microbiological analysis. Where samples are received above this temperature, it should be taken into consideration when interpreting results. Refer to ALS EnviroMail 85 for ALS recommendations of the best practice for chilling samples after sampling and for maintaining a cool temperature during transit.

Sample Container(s)/Preservation Non-Compliances

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

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

Summary of Sample(s) and Requested Analysis

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

Matrix: **WATER**

Laboratory sample ID	Sampling date / time	Sample ID	WATER - EP231X PFAS - Full Suite (28 analytes)
ES2341145-001	28-Nov-2023 08:29	1200_MW004D_231128	✓
ES2341145-005	28-Nov-2023 00:00	1200_QC100_231128	✓
ES2341145-006	28-Nov-2023 00:00	1200_QC300_231128	✓
ES2341145-007	28-Nov-2023 00:00	1200_QC400_231128	✓
ES2341145-008	28-Nov-2023 00:00	1200_QC500_231128	✓
ES2341145-009	28-Nov-2023 09:31	1200_SW086_231128	✓
ES2341145-010	28-Nov-2023 10:00	1200_SW123_231128	✓
ES2341145-011	28-Nov-2023 10:25	1200_SW091_231128	✓

Proactive Holding Time Report

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

[redacted]

CERTIFICATE OF ANALYSIS

Work Order	: **ES2341145**	Page	: 1 of 7
Amendment	: **1**		
Client	[redacted]	Laboratory	: Environmental Division Sydney
Contact		Contact	[redacted]
Address		Address	
Telephone	: ----	Telephone	
Project	: NT_1200_PFASOMP_23	Date Samples Received	: 29-Nov-2023 15:30
Order number	: 60612561/2.1	Date Analysis Commenced	: 01-Dec-2023
C-O-C number	: ----	Issue Date	: 13-Dec-2023 08:11
Sampler	: [redacted]		
Site	: ----		
Quote number	: SY/139/19 V3		
No. of samples received	: 11		
No. of samples analysed	: 8		

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

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

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

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

Signatories

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

Signatories	*Position*	*Accreditation Category*
[redacted]		

General Comments

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

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

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

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

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

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

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

- EP231X - Per- and Polyfluoroalkyl Substances (PFAS): Samples received in 20ml or 125ml bottles have been tested in accordance with the QSM5.3 compliant, NATA accredited method. 60mL or 250mL bottles have been tested to the legacy QSM 5.1 aligned, NATA accredited method.
- EP231X: Positive result for analyte Perfluorooctane sulfonic acid (PFOS) on sample 1200_QC100_231128 (ES2341145-005) has been confirmed by re-extraction and re-analysis.
- Amendment (08/12/2023):This report has been amended to add the missing PFAS containers that had been logged under workorder ES2341247 to allow for these samples to be analysed.
- EP231: Stable isotope enriched internal standards are added to samples prior to extraction. Target compounds have a direct analogous internal standard with the exception of PFPeS, PFHpA, PFDS, PFTrDA and 10:2 FTS. These compounds use an internal standard that is chemically related and has a retention time close to that of the target compound. The DQO for internal standard response is 50-150% of that established at initial calibration. PFOS is quantified using a certified, traceable standard consisting of linear and branched PFOS isomers. These practices are in line with recommendations in the National Environmental Management Plan for PFAS (Australian HEPA) and also conform to QSM 5.3 (US DoD) requirements.

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	1200_MW004D_231128	1200_QC100_231128	1200_QC300_231128	1200_QC400_231128	1200_QC500_231128
				Sampling date / time	28-Nov-2023 08:29	28-Nov-2023 00:00	28-Nov-2023 00:00	28-Nov-2023 00:00	28-Nov-2023 00:00
Compound	CAS Number	LOR	Unit		ES2341145-001	ES2341145-005	ES2341145-006	ES2341145-007	ES2341145-008
					Result	Result	Result	Result	Result
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		**0.02**	**0.03**	<0.01	<0.01	<0.01
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		<0.1	<0.1	<0.1	<0.1	<0.1
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	1200_MW004D_231128	1200_QC100_231128	1200_QC300_231128	1200_QC400_231128	1200_QC500_231128
				Sampling date / time	28-Nov-2023 08:29	28-Nov-2023 00:00	28-Nov-2023 00:00	28-Nov-2023 00:00	28-Nov-2023 00:00
Compound	CAS Number	LOR	Unit		ES2341145-001	ES2341145-005	ES2341145-006	ES2341145-007	ES2341145-008
					Result	Result	Result	Result	Result
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L		**0.02**	**0.03**	<0.01	<0.01	<0.01
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		**0.02**	**0.03**	<0.01	<0.01	<0.01
Sum of PFAS (WA DER List)	----	0.01	µg/L		**0.02**	**0.03**	<0.01	<0.01	<0.01
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**91.9**	**95.0**	**102**	**98.5**	**98.6**
13C8-PFOA	----	0.02	%		**112**	**118**	**105**	**102**	**105**

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	1200_SW086_231128	1200_SW123_231128	1200_SW091_231128	----	----
				Sampling date / time	28-Nov-2023 09:31	28-Nov-2023 10:00	28-Nov-2023 10:25	----	----
Compound	CAS Number	LOR	Unit		ES2341145-009	ES2341145-010	ES2341145-011	--------	--------
					Result	Result	Result	----	----
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		<0.02	<0.02	<0.02	----	----
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		<0.02	<0.02	<0.02	----	----
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		<0.01	**0.07**	**0.02**	----	----
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		<0.02	<0.02	<0.02	----	----
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		<0.01	**0.11**	**0.03**	----	----
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	<0.02	<0.02	----	----
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		<0.1	<0.1	<0.1	----	----
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		<0.02	<0.02	<0.02	----	----
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		<0.02	<0.02	<0.02	----	----
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		<0.02	<0.02	<0.02	----	----
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		<0.01	<0.01	<0.01	----	----
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		<0.02	<0.02	<0.02	----	----
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L		<0.02	<0.02	<0.02	----	----
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L		<0.02	<0.02	<0.02	----	----
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L		<0.02	<0.02	<0.02	----	----
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L		<0.02	<0.02	<0.02	----	----
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		<0.05	<0.05	<0.05	----	----
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L		<0.02	<0.02	<0.02	----	----
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L		<0.05	<0.05	<0.05	----	----

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	1200_SW086_231128	1200_SW123_231128	1200_SW091_231128	----	----
				Sampling date / time	28-Nov-2023 09:31	28-Nov-2023 10:00	28-Nov-2023 10:25	----	----
Compound	CAS Number	LOR	Unit		ES2341145-009	ES2341145-010	ES2341145-011	--------	--------
					Result	Result	Result	----	----
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L		<0.05	<0.05	<0.05	----	----
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L		<0.05	<0.05	<0.05	----	----
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L		<0.05	<0.05	<0.05	----	----
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L		<0.02	<0.02	<0.02	----	----
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L		<0.02	<0.02	<0.02	----	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L		<0.05	<0.05	<0.05	----	----
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		<0.05	<0.05	<0.05	----	----
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		<0.05	<0.05	<0.05	----	----
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L		<0.05	<0.05	<0.05	----	----
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L		<0.01	**0.18**	**0.05**	----	----
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		<0.01	**0.18**	**0.05**	----	----
Sum of PFAS (WA DER List)	----	0.01	µg/L		<0.01	**0.18**	**0.05**	----	----
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**94.6**	**90.5**	**97.4**	----	----
13C8-PFOA	----	0.02	%		**103**	**106**	**102**	----	----

Surrogate Control Limits

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

QUALITY CONTROL REPORT

Work Order	: **ES2341145**	Page	: 1 of 7
Amendment	: **1**		
Client	[redacted]	Laboratory	: Environmental Division Sydney
Contact		Contact	[redacted]
Address		Address	
Telephone	: ----	Telephone	
Project	: NT_1200_PFASOMP_23	Date Samples Received	: 29-Nov-2023
Order number	: 60612561/2.1	Date Analysis Commenced	: 01-Dec-2023
C-O-C number	: ----	Issue Date	: 13-Dec-2023
Sampler	[redacted]		
Site	: ----		
Quote number	: SY/139/19 V3		
No. of samples received	: 11		
No. of samples analysed	: 8		

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

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

This Quality Control Report contains the following information:

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

Signatories

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

Signatories	*Position*	*Accreditation Category*
[redacted]		

General Comments

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

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

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

Key : Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot
CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
RPD = Relative Percentage Difference
# = Indicates failed QC
* = The final LOR has been raised due to dilution or other sample specific cause; adjusted LOR is shown in brackets. The duplicate ranges for Acceptable RPD% are applied to the final LOR where applicable.

Laboratory Duplicate (DUP) Report

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

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 5463103)									
CA2307425-001	Anonymous	EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01 (0.02)*	µg/L	0.38	0.36	3.3	0% - 50%
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	0.08	0.08	0.0	No Limit
		EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	0.30	0.28	7.0	0% - 50%
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	0.02	0.03	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 5463103)									
CA2307425-001	Anonymous	EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	0.22	0.23	6.5	0% - 20%
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	0.26	0.27	0.0	0% - 50%
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	0.49	0.50	2.2	0% - 20%
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	0.10	0.10	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	0.5	0.5	0.0	No Limit
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 5463103)									
CA2307425-001	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 5463103) - continued									
CA2307425-001	Anonymous	EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 5463103)									
CA2307425-001	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP231P: PFAS Sums (QC Lot: 5463103)									
CA2307425-001	Anonymous	EP231X: Sum of PFAS	----	0.01	µg/L	2.35	2.35	0.0	0% - 20%

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

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

Sub-Matrix: **WATER**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5463103)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.25 µg/L	97.5	72.0	130
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.25 µg/L	97.0	71.0	127
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	0.25 µg/L	94.9	68.0	131
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.25 µg/L	101	69.0	134
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.25 µg/L	95.6	65.0	140
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.25 µg/L	93.8	53.0	142
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5479892)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.25 µg/L	88.5	72.0	130
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.25 µg/L	87.5	71.0	127
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	0.25 µg/L	84.8	68.0	131
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.25 µg/L	94.1	69.0	134
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.25 µg/L	83.2	65.0	140
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.25 µg/L	81.6	53.0	142
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5463103)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	1.25 µg/L	89.9	73.0	129
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	0.25 µg/L	109	72.0	129
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	0.25 µg/L	102	72.0	129
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	0.25 µg/L	105	72.0	130
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	0.25 µg/L	108	71.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	0.25 µg/L	104	69.0	130
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	0.25 µg/L	104	71.0	129
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	0.25 µg/L	100	69.0	133
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	0.25 µg/L	104	72.0	134
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	0.25 µg/L	94.4	65.0	144
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	0.625 µg/L	95.6	71.0	132
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5479892)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	1.25 µg/L	74.5	73.0	129
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	0.25 µg/L	89.2	72.0	129
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	0.25 µg/L	95.3	72.0	129
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	0.25 µg/L	91.2	72.0	130

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
				Result	Concentration	LCS	Low	High
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5479892) - continued								
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	0.25 µg/L	93.7	71.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	0.25 µg/L	85.9	69.0	130
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	0.25 µg/L	90.5	71.0	129
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	0.25 µg/L	83.0	69.0	133
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	0.25 µg/L	96.6	72.0	134
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	0.25 µg/L	93.6	65.0	144
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	0.625 µg/L	99.6	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5463103)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.25 µg/L	85.8	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	0.625 µg/L	107	68.0	141
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	0.625 µg/L	87.7	62.6	147
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	0.625 µg/L	86.3	66.0	145
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	0.625 µg/L	95.6	57.6	145
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	0.25 µg/L	97.1	65.0	136
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	0.25 µg/L	93.2	61.0	135
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5479892)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.25 µg/L	94.4	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	0.625 µg/L	99.9	68.0	141
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	0.625 µg/L	85.4	62.6	147
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	0.625 µg/L	88.0	66.0	145
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	0.625 µg/L	96.6	57.6	145
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	0.25 µg/L	90.2	65.0	136
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	0.25 µg/L	91.9	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5463103)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.25 µg/L	120	63.0	143
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	0.25 µg/L	116	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	0.25 µg/L	123	67.0	138
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	0.25 µg/L	94.1	71.4	144

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Acceptable Limits (%): Low	Acceptable Limits (%): High
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5479892)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.25 µg/L	82.5	63.0	143
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	0.25 µg/L	89.5	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	0.25 µg/L	106	67.0	138
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	0.25 µg/L	89.3	71.4	144

Matrix Spike (MS) Report

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

Sub-Matrix: **WATER**

Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report: Spike Concentration	SpikeRecovery(%): MS	Acceptable Limits (%): Low	Acceptable Limits (%): High
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5463103)							
CA2307425-001	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.25 µg/L	94.9	72.0	130
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.25 µg/L	87.8	71.0	127
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.25 µg/L	109	68.0	131
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.25 µg/L	113	69.0	134
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.25 µg/L	101	65.0	140
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.25 µg/L	91.8	53.0	142
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5463103)							
CA2307425-001	Anonymous	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	1.25 µg/L	96.0	73.0	129
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.25 µg/L	105	72.0	129
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.25 µg/L	85.4	72.0	129
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.25 µg/L	94.2	72.0	130
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.25 µg/L	109	71.0	133
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.25 µg/L	103	69.0	130
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.25 µg/L	103	71.0	129
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.25 µg/L	104	69.0	133
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.25 µg/L	109	72.0	134
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.25 µg/L	93.7	65.0	144
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.625 µg/L	106	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5463103)							
CA2307425-001	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.25 µg/L	97.5	67.0	137
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.625 µg/L	118	68.0	141
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.625 µg/L	100	62.6	147
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.625 µg/L	92.9	66.0	145

Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*Concentration*	*MS*	*Low*	*High*
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5463103) - continued							
CA2307425-001	Anonymous	EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.625 µg/L	106	57.6	145
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.25 µg/L	97.6	65.0	136
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.25 µg/L	105	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5463103)							
CA2307425-001	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.25 µg/L	87.7	63.0	143
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.25 µg/L	102	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.25 µg/L	96.8	67.0	138
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.25 µg/L	76.2	71.4	144

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **ES2341145**	Page	: 1 of 5
Amendment	: **1**		
Client	[redacted]	Laboratory	: Environmental Division Sydney
Contact		Telephone	[redacted]
Project		Date Samples Received	: 29-Nov-2023
Site	: ----	Issue Date	: 13-Dec-2023
Sampler	[redacted]	No. of samples received	: 11
Order number	: 60612561/2.1	No. of samples analysed	: 8

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

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

Summary of Outliers

Outliers : Quality Control Samples

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

- **NO Method Blank value outliers occur.**
- **NO Duplicate outliers occur.**
- **NO Laboratory Control outliers occur.**
- **NO Matrix Spike outliers occur.**
- **For all regular sample matrices, NO surrogate recovery outliers occur.**

Outliers : Analysis Holding Time Compliance

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

Outliers : Frequency of Quality Control Samples

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

Outliers : Frequency of Quality Control Samples

Matrix: **WATER**

Quality Control Sample Type		Count		Rate (%)		Quality Control Specification
Analytical Methods	Method	QC	Regular	Actual	Expected	
Laboratory Duplicates (DUP)						
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	13	7.69	10.00	NEPM 2013 B3 & ALS QC Standard

Analysis Holding Time Compliance

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

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

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

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

Matrix: **WATER**

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

Method / Container / Client Sample ID(s)		Sample Date	Extraction / Preparation			Analysis		
			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP231A: Perfluoroalkyl Sulfonic Acids								
HDPE (no PTFE) (EP231X)								
1200_MW004D_231128, 1200_QC300_231128, 1200_QC500_231128	1200_QC100_231128, 1200_QC400_231128,	**28-Nov-2023**	**01-Dec-2023**	26-May-2024	✓	**04-Dec-2023**	26-May-2024	✓
HDPE (no PTFE) (EP231X)								
1200_SW086_231128, 1200_SW091_231128	1200_SW123_231128,	**28-Nov-2023**	**11-Dec-2023**	26-May-2024	✓	**12-Dec-2023**	26-May-2024	✓
EP231B: Perfluoroalkyl Carboxylic Acids								
HDPE (no PTFE) (EP231X)								
1200_MW004D_231128, 1200_QC300_231128, 1200_QC500_231128	1200_QC100_231128, 1200_QC400_231128,	**28-Nov-2023**	**01-Dec-2023**	26-May-2024	✓	**04-Dec-2023**	26-May-2024	✓
HDPE (no PTFE) (EP231X)								
1200_SW086_231128, 1200_SW091_231128	1200_SW123_231128,	**28-Nov-2023**	**11-Dec-2023**	26-May-2024	✓	**12-Dec-2023**	26-May-2024	✓
EP231C: Perfluoroalkyl Sulfonamides								
HDPE (no PTFE) (EP231X)								
1200_MW004D_231128, 1200_QC300_231128, 1200_QC500_231128	1200_QC100_231128, 1200_QC400_231128,	**28-Nov-2023**	**01-Dec-2023**	26-May-2024	✓	**04-Dec-2023**	26-May-2024	✓
HDPE (no PTFE) (EP231X)								
1200_SW086_231128, 1200_SW091_231128	1200_SW123_231128,	**28-Nov-2023**	**11-Dec-2023**	26-May-2024	✓	**12-Dec-2023**	26-May-2024	✓

Matrix: **WATER**

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

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP231D: (n:2) Fluorotelomer Sulfonic Acids							
HDPE (no PTFE) (EP231X) 1200_MW004D_231128, 1200_QC100_231128, 1200_QC300_231128, 1200_QC400_231128, 1200_QC500_231128	**28-Nov-2023**	**01-Dec-2023**	26-May-2024	✓	**04-Dec-2023**	26-May-2024	✓
HDPE (no PTFE) (EP231X) 1200_SW086_231128, 1200_SW123_231128, 1200_SW091_231128	**28-Nov-2023**	**11-Dec-2023**	26-May-2024	✓	**12-Dec-2023**	26-May-2024	✓
EP231P: PFAS Sums							
HDPE (no PTFE) (EP231X) 1200_MW004D_231128, 1200_QC100_231128, 1200_QC300_231128, 1200_QC400_231128, 1200_QC500_231128	**28-Nov-2023**	**01-Dec-2023**	26-May-2024	✓	**04-Dec-2023**	26-May-2024	✓
HDPE (no PTFE) (EP231X) 1200_SW086_231128, 1200_SW123_231128, 1200_SW091_231128	**28-Nov-2023**	**11-Dec-2023**	26-May-2024	✓	**12-Dec-2023**	26-May-2024	✓

Quality Control Parameter Frequency Compliance

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

Matrix: **WATER**

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

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	13	**7.69**	**10.00**	×	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	13	**15.38**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	13	**15.38**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	13	**7.69**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard

Brief Method Summaries

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

Analytical Methods	Method	Matrix	Method Descriptions
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	WATER	In-house: Analysis of fresh and saline waters by Solid Phase Extraction (SPE) followed by LC-Electrospray-MS-MS, Negative Mode using MRM and internal standard quantitation. Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to the sample container. The entire contents are transferred to a solid phase extraction (SPE) cartridge. The sample container is successively rinsed with aliquots of the elution solvent. The eluted extract is combined with an equal volume of reagent water and a portion is filtered for analysis. Method procedures and data quality objectives conform to US DoD QSM 5.3, table B-15 requirements.

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

SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order	: **ES2343723**		
Client	[redacted]	Laboratory	: Environmental Division Sydney
Contact		Contact	
Address		Address	[redacted]
E-mail		E-mail	
Telephone		Telephone	
Facsimile	: ----	Facsimile	
Project	: NT_1200_PFASOMP_23	Page	: 1 of 3
Order number	: 60612561/2.1	Quote number	: ES2019AECOMAU0030 (SY/139/19 V3)
C-O-C number	: 61425	QC Level	: NEPM 2013 B3 & ALS QC Standard
Site	: Robertson Barracks - OMP SW		
Sampler	: [redacted]		

Dates

Date Samples Received	: 19-Dec-2023 08:30	Issue Date	: 19-Dec-2023
Client Requested Due Date	: 02-Jan-2024	Scheduled Reporting Date	: **02-Jan-2024**

Delivery Details

Mode of Delivery	: Client Drop Off	Security Seal	: Not Available
No. of coolers/boxes	: 1	Temperature	: 28.5'C DRW 10.3'C 11.0'C 6.4'C SYD
Receipt Detail	:	No. of samples received / analysed	: 13 / 13

General Comments

- This report contains the following information:
  - Sample Container(s)/Preservation Non-Compliances
  - Summary of Sample(s) and Requested Analysis
  - Proactive Holding Time Report
  - Requested Deliverables
- **Please refer to the Proactive Holding Time Report table below which summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory. The laboratory will process these samples unless instructions are received from you indicating you do not wish to proceed. The absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.**
- **QC Forward analysis will be conducted by NMI.**
- Please direct any queries you have regarding this work order to the above ALS laboratory contact.
- Analytical work for this work order will be conducted at ALS Sydney.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months ± 1 week) from receipt of samples.
- Please be aware that APHA/NEPM recommends water and soil samples be chilled to less than or equal to 6°C for chemical analysis, and less than or equal to 10°C but unfrozen for Microbiological analysis. Where samples are received above this temperature, it should be taken into consideration when interpreting results. Refer to ALS EnviroMail 85 for ALS recommendations of the best practice for chilling samples after sampling and for maintaining a cool temperature during transit.

Sample Container(s)/Preservation Non-Compliances

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

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

Summary of Sample(s) and Requested Analysis

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

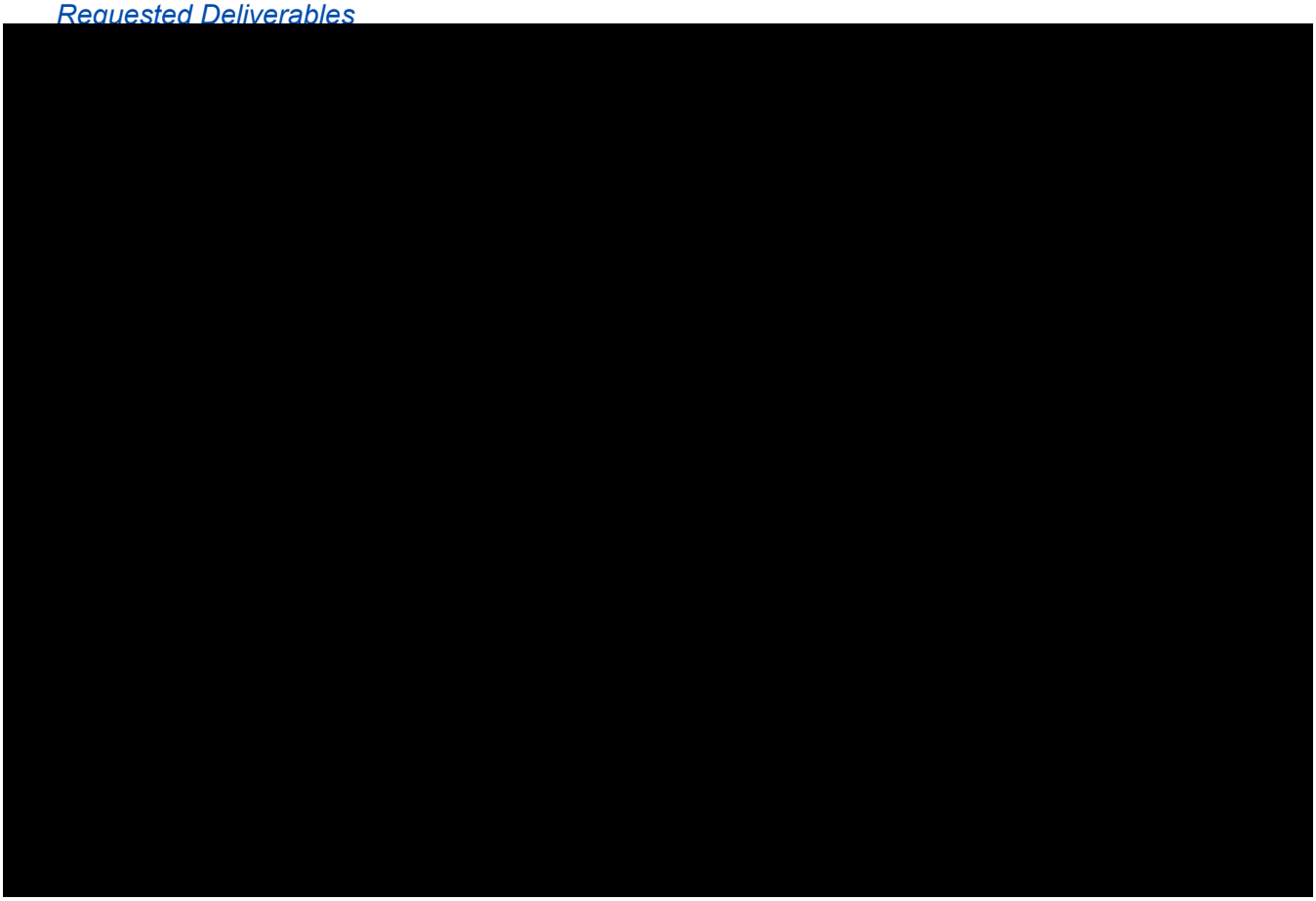
Matrix: **WATER**

Laboratory sample ID	*Sampling date / time*	*Sample ID*	WATER - EP231X PFAS - Full Suite (28 analytes)
ES2343723-001	15-Dec-2023 15:01	1200_SW028_231215	✓
ES2343723-002	15-Dec-2023 15:02	1200_SW075_231215	✓
ES2343723-003	12-Dec-2023 08:15	1200_QC100_231215	✓
ES2343723-005	15-Dec-2023 15:10	1200_QC301_231215	✓
ES2343723-006	12-Dec-2023 08:16	1200_QC400_231215	✓
ES2343723-007	12-Dec-2023 08:16	1200_QC500_231215	✓
ES2343723-008	15-Dec-2023 15:04	1200_SW001_231012	✓
ES2343723-009	15-Dec-2023 15:05	1200_SW007_231215	✓
ES2343723-010	15-Dec-2023 15:07	1200_SW023_231215	✓
ES2343723-011	15-Dec-2023 15:12	1200_SW059_231215	✓
ES2343723-012	15-Dec-2023 15:13	1200_QC100_231215	✓
ES2343723-014	15-Dec-2023 15:19	1200_QC300_231211	✓
ES2343723-015	15-Dec-2023 15:20	1200_QC400_231211	✓

Proactive Holding Time Report

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

Requested Deliverables



CERTIFICATE OF ANALYSIS

Work Order	: **ES2343723**	Page	: 1 of 9
Client	: [redacted]	Laboratory	: Environmental Division Sydney
Contact	:	Contact	[redacted]
Address	:	Address	
Telephone	:	Telephone	
Project	: NT_1200_PFASOMP_23	Date Samples Received	: 19-Dec-2023 08:30
Order number	: 60612561/2.1	Date Analysis Commenced	: 20-Dec-2023
C-O-C number	: 61425	Issue Date	: 02-Jan-2024 08:02
Sampler	: [redacted]		
Site	: Robertson Barracks - OMP SW		
Quote number	: SY/139/19 V3		
No. of samples received	: 13		
No. of samples analysed	: 13		

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

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

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

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

Signatories

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

Signatories	*Position*	*Accreditation Category*
[redacted]		

General Comments

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

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

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

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

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

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

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

- EP231X - Per- and Polyfluoroalkyl Substances (PFAS): Samples received in 20ml or 125ml bottles have been tested in accordance with the QSM5.3 compliant, NATA accredited method. 60mL or 250mL bottles have been tested to the legacy QSM 5.1 aligned, NATA accredited method.
- EP231: Stable isotope enriched internal standards are added to samples prior to extraction. Target compounds have a direct analogous internal standard with the exception of PFPeS, PFHpA, PFDS, PFTrDA and 10:2 FTS. These compounds use an internal standard that is chemically related and has a retention time close to that of the target compound. The DQO for internal standard response is 50-150% of that established at initial calibration. PFOS is quantified using a certified, traceable standard consisting of linear and branched PFOS isomers. These practices are in line with recommendations in the National Environmental Management Plan for PFAS (Australian HEPA) and also conform to QSM 5.3 (US DoD) requirements.

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	1200_SW028_231215	1200_SW075_231215	1200_QC100_231215	1200_QC301_231215	1200_QC400_231215
				Sampling date / time	15-Dec-2023 15:01	15-Dec-2023 15:02	12-Dec-2023 08:15	15-Dec-2023 15:10	12-Dec-2023 08:16
Compound	CAS Number	LOR	Unit		ES2343723-001	ES2343723-002	ES2343723-003	ES2343723-005	ES2343723-006
					Result	Result	Result	Result	Result
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		<0.01	**0.03**	<0.01	<0.01	<0.01
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		<0.01	**0.07**	<0.01	<0.01	<0.01
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		<0.1	<0.1	<0.1	<0.1	<0.1
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	1200_SW028_231215	1200_SW075_231215	1200_QC100_231215	1200_QC301_231215	1200_QC400_231215
				Sampling date / time	15-Dec-2023 15:01	15-Dec-2023 15:02	12-Dec-2023 08:15	15-Dec-2023 15:10	12-Dec-2023 08:16
Compound	CAS Number	LOR	Unit		ES2343723-001	ES2343723-002	ES2343723-003	ES2343723-005	ES2343723-006
					Result	Result	Result	Result	Result
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L		<0.01	**0.10**	<0.01	<0.01	<0.01
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		<0.01	**0.10**	<0.01	<0.01	<0.01
Sum of PFAS (WA DER List)	----	0.01	µg/L		<0.01	**0.10**	<0.01	<0.01	<0.01
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**104**	**106**	**97.8**	**97.8**	**100**
13C8-PFOA	----	0.02	%		**98.2**	**99.2**	**103**	**101**	**98.5**

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	1200_QC500_231215	1200_SW001_231012	1200_SW007_231215	1200_SW023_231215	1200_SW059_231215
				Sampling date / time	12-Dec-2023 08:16	15-Dec-2023 15:04	15-Dec-2023 15:05	15-Dec-2023 15:07	15-Dec-2023 15:12
Compound	CAS Number	LOR	Unit		ES2343723-007	ES2343723-008	ES2343723-009	ES2343723-010	ES2343723-011
					Result	Result	Result	Result	Result
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		<0.01	**0.01**	<0.01	<0.01	**0.06**
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		<0.1	<0.1	<0.1	<0.1	<0.1
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	1200_QC500_231215	1200_SW001_231012	1200_SW007_231215	1200_SW023_231215	1200_SW059_231215
				Sampling date / time	12-Dec-2023 08:16	15-Dec-2023 15:04	15-Dec-2023 15:05	15-Dec-2023 15:07	15-Dec-2023 15:12
Compound	CAS Number	LOR	Unit		ES2343723-007	ES2343723-008	ES2343723-009	ES2343723-010	ES2343723-011
					Result	Result	Result	Result	Result
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L		<0.01	**0.01**	<0.01	<0.01	**0.06**
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		<0.01	**0.01**	<0.01	<0.01	**0.06**
Sum of PFAS (WA DER List)	----	0.01	µg/L		<0.01	**0.01**	<0.01	<0.01	**0.06**
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**100**	**101**	**101**	**99.3**	**104**
13C8-PFOA	----	0.02	%		**103**	**102**	**99.4**	**101**	**105**

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	1200_QC100_231215	1200_QC300_231211	1200_QC400_231211	----	----
				Sampling date / time	15-Dec-2023 15:13	15-Dec-2023 15:19	15-Dec-2023 15:20	----	----
Compound	CAS Number	LOR	Unit		ES2343723-012	ES2343723-014	ES2343723-015	--------	--------
					Result	Result	Result	----	----
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		<0.02	<0.02	<0.02	----	----
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		<0.02	<0.02	<0.02	----	----
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		**0.01**	<0.01	<0.01	----	----
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		<0.02	<0.02	<0.02	----	----
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		**0.07**	<0.01	<0.01	----	----
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	<0.02	<0.02	----	----
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		<0.1	<0.1	<0.1	----	----
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		<0.02	<0.02	<0.02	----	----
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		<0.02	<0.02	<0.02	----	----
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		<0.02	<0.02	<0.02	----	----
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		<0.01	<0.01	<0.01	----	----
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		<0.02	<0.02	<0.02	----	----
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L		<0.02	<0.02	<0.02	----	----
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L		<0.02	<0.02	<0.02	----	----
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L		<0.02	<0.02	<0.02	----	----
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L		<0.02	<0.02	<0.02	----	----
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		<0.05	<0.05	<0.05	----	----
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L		<0.02	<0.02	<0.02	----	----
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L		<0.05	<0.05	<0.05	----	----

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	1200_QC100_231215	1200_QC300_231211	1200_QC400_231211	----	----
				Sampling date / time	15-Dec-2023 15:13	15-Dec-2023 15:19	15-Dec-2023 15:20	----	----
Compound	CAS Number	LOR	Unit		ES2343723-012	ES2343723-014	ES2343723-015	--------	--------
					Result	Result	Result	----	----
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L		<0.05	<0.05	<0.05	----	----
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L		<0.05	<0.05	<0.05	----	----
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L		<0.05	<0.05	<0.05	----	----
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L		<0.02	<0.02	<0.02	----	----
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L		<0.02	<0.02	<0.02	----	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L		<0.05	<0.05	<0.05	----	----
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		<0.05	<0.05	<0.05	----	----
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		<0.05	<0.05	<0.05	----	----
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L		<0.05	<0.05	<0.05	----	----
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L		**0.08**	<0.01	<0.01	----	----
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		**0.08**	<0.01	<0.01	----	----
Sum of PFAS (WA DER List)	----	0.01	µg/L		**0.08**	<0.01	<0.01	----	----
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**103**	**89.8**	**90.3**	----	----
13C8-PFOA	----	0.02	%		**101**	**103**	**92.8**	----	----

Surrogate Control Limits

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

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **ES2343723**	Page	: 1 of 5
Client	: [redacted]	Laboratory	: Environmental Division Sydney
Contact	: [redacted]	Telephone	[redacted]
Project	: NT_1200_PFASOMP_23	Date Samples Received	: 19-Dec-2023
Site	: Robertson Barracks - OMP SW	Issue Date	: 02-Jan-2024
Sampler	: [redacted]	No. of samples received	: 13
Order number	: 60612561/2.1	No. of samples analysed	: 13

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

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

Summary of Outliers

Outliers : Quality Control Samples

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

- **NO Method Blank value outliers occur.**
- **NO Duplicate outliers occur.**
- **NO Laboratory Control outliers occur.**
- **NO Matrix Spike outliers occur.**
- **For all regular sample matrices, NO surrogate recovery outliers occur.**

Outliers : Analysis Holding Time Compliance

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

Outliers : Frequency of Quality Control Samples

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

Outliers : Frequency of Quality Control Samples

Matrix: **WATER**

Quality Control Sample Type		Count		Rate (%)		Quality Control Specification
Analytical Methods	Method	QC	Regular	Actual	Expected	
Laboratory Duplicates (DUP)						
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	3	31	9.68	10.00	NEPM 2013 B3 & ALS QC Standard

Analysis Holding Time Compliance

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

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

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

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

Matrix: **WATER**

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

Method / Container / Client Sample ID(s)		Sample Date	Extraction / Preparation			Analysis		
			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP231A: Perfluoroalkyl Sulfonic Acids								
HDPE (no PTFE) (EP231X)								
1200_QC100_231215,	1200_QC400_231215,	**12-Dec-2023**	**20-Dec-2023**	09-Jun-2024	✓	**22-Dec-2023**	09-Jun-2024	✓
1200_QC500_231215								
HDPE (no PTFE) (EP231X)								
1200_SW059_231215,	1200_QC100_231215,	**15-Dec-2023**	**20-Dec-2023**	12-Jun-2024	✓	**21-Dec-2023**	12-Jun-2024	✓
1200_QC300_231211,	1200_QC400_231211							
HDPE (no PTFE) (EP231X)								
1200_SW028_231215,	1200_SW075_231215,	**15-Dec-2023**	**20-Dec-2023**	12-Jun-2024	✓	**22-Dec-2023**	12-Jun-2024	✓
1200_QC301_231215,	1200_SW001_231012,							
1200_SW007_231215,	1200_SW023_231215							
EP231B: Perfluoroalkyl Carboxylic Acids								
HDPE (no PTFE) (EP231X)								
1200_QC100_231215,	1200_QC400_231215,	**12-Dec-2023**	**20-Dec-2023**	09-Jun-2024	✓	**22-Dec-2023**	09-Jun-2024	✓
1200_QC500_231215								
HDPE (no PTFE) (EP231X)								
1200_SW059_231215,	1200_QC100_231215,	**15-Dec-2023**	**20-Dec-2023**	12-Jun-2024	✓	**21-Dec-2023**	12-Jun-2024	✓
1200_QC300_231211,	1200_QC400_231211							
HDPE (no PTFE) (EP231X)								
1200_SW028_231215,	1200_SW075_231215,	**15-Dec-2023**	**20-Dec-2023**	12-Jun-2024	✓	**22-Dec-2023**	12-Jun-2024	✓
1200_QC301_231215,	1200_SW001_231012,							
1200_SW007_231215,	1200_SW023_231215							

Matrix: **WATER**

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

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP231C: Perfluoroalkyl Sulfonamides							
HDPE (no PTFE) (EP231X) 1200_QC100_231215, 1200_QC400_231215, 1200_QC500_231215	**12-Dec-2023**	**20-Dec-2023**	09-Jun-2024	✓	**22-Dec-2023**	09-Jun-2024	✓
HDPE (no PTFE) (EP231X) 1200_SW059_231215, 1200_QC100_231215, 1200_QC300_231211, 1200_QC400_231211	**15-Dec-2023**	**20-Dec-2023**	12-Jun-2024	✓	**21-Dec-2023**	12-Jun-2024	✓
HDPE (no PTFE) (EP231X) 1200_SW028_231215, 1200_SW075_231215, 1200_QC301_231215, 1200_SW001_231012, 1200_SW007_231215, 1200_SW023_231215	**15-Dec-2023**	**20-Dec-2023**	12-Jun-2024	✓	**22-Dec-2023**	12-Jun-2024	✓
EP231D: (n:2) Fluorotelomer Sulfonic Acids							
HDPE (no PTFE) (EP231X) 1200_QC100_231215, 1200_QC400_231215, 1200_QC500_231215	**12-Dec-2023**	**20-Dec-2023**	09-Jun-2024	✓	**22-Dec-2023**	09-Jun-2024	✓
HDPE (no PTFE) (EP231X) 1200_SW059_231215, 1200_QC100_231215, 1200_QC300_231211, 1200_QC400_231211	**15-Dec-2023**	**20-Dec-2023**	12-Jun-2024	✓	**21-Dec-2023**	12-Jun-2024	✓
HDPE (no PTFE) (EP231X) 1200_SW028_231215, 1200_SW075_231215, 1200_QC301_231215, 1200_SW001_231012, 1200_SW007_231215, 1200_SW023_231215	**15-Dec-2023**	**20-Dec-2023**	12-Jun-2024	✓	**22-Dec-2023**	12-Jun-2024	✓
EP231P: PFAS Sums							
HDPE (no PTFE) (EP231X) 1200_QC100_231215, 1200_QC400_231215, 1200_QC500_231215	**12-Dec-2023**	**20-Dec-2023**	09-Jun-2024	✓	**22-Dec-2023**	09-Jun-2024	✓
HDPE (no PTFE) (EP231X) 1200_SW059_231215, 1200_QC100_231215, 1200_QC300_231211, 1200_QC400_231211	**15-Dec-2023**	**20-Dec-2023**	12-Jun-2024	✓	**21-Dec-2023**	12-Jun-2024	✓
HDPE (no PTFE) (EP231X) 1200_SW028_231215, 1200_SW075_231215, 1200_QC301_231215, 1200_SW001_231012, 1200_SW007_231215, 1200_SW023_231215	**15-Dec-2023**	**20-Dec-2023**	12-Jun-2024	✓	**22-Dec-2023**	12-Jun-2024	✓

Quality Control Parameter Frequency Compliance

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

Matrix: **WATER**

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

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	3	31	**9.68**	**10.00**	×	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	31	**6.45**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	31	**6.45**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	31	**6.45**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard

Brief Method Summaries

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

Analytical Methods	Method	Matrix	Method Descriptions
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	WATER	In-house: Analysis of fresh and saline waters by Solid Phase Extraction (SPE) followed by LC-Electrospray-MS-MS, Negative Mode using MRM and internal standard quantitation. Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to the sample container. The entire contents are transferred to a solid phase extraction (SPE) cartridge. The sample container is successively rinsed with aliquots of the elution solvent. The eluted extract is combined with an equal volume of reagent water and a portion is filtered for analysis. Method procedures and data quality objectives conform to US DoD QSM 5.3, table B-15 requirements.

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

QUALITY CONTROL REPORT

Work Order	: **ES2343723**	Page	: 1 of 10
Client	: [redacted]	Laboratory	: Environmental Division Sydney
Contact	: [redacted]	Contact	: [redacted]
Address	: [redacted]	Address	: [redacted]
Telephone	: [redacted]	Telephone	: [redacted]
Project	: NT_1200_PFASOMP_23	Date Samples Received	: 19-Dec-2023
Order number	: 60612561/2.1	Date Analysis Commenced	: 20-Dec-2023
C-O-C number	: 61425	Issue Date	: 02-Jan-2024
Sampler	: [redacted]		
Site	: Robertson Barracks - OMP SW		
Quote number	: SY/139/19 V3		
No. of samples received	: 13		
No. of samples analysed	: 13		

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

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

This Quality Control Report contains the following information:

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

Signatories

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

Signatories	*Position*	*Accreditation Category*
[redacted]		

General Comments

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

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

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

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

Laboratory Duplicate (DUP) Report

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

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 5505201)									
ES2343723-009	1200_SW007_231215	EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 5505220)									
ES2343723-011	1200_SW059_231215	EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	0.06	0.06	0.0	No Limit
		EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
ES2343823-001	Anonymous	EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	0.02	0.03	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	0.10	0.11	0.0	0% - 50%
		EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 5505201)									
ES2343723-009	1200_SW007_231215	EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 5505201) - continued									
ES2343723-009	1200_SW007_231215	EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	<0.1	0.0	No Limit
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 5505220)									
ES2343723-011	1200_SW059_231215	EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	<0.1	0.0	No Limit
ES2343823-001	Anonymous	EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	<0.1	0.0	No Limit
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 5505201)									
ES2343723-009	1200_SW007_231215	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit

Sub-Matrix: **WATER**

Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Laboratory Duplicate (DUP) Report					
				LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 5505201) - continued									
ES2343723-009	1200_SW007_231215	EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 5505220)									
ES2343723-011	1200_SW059_231215	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
ES2343823-001	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 5505201)									
ES2343723-009	1200_SW007_231215	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 5505201) - continued									
ES2343723-009	1200_SW007_231215	EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 5505220)									
ES2343723-011	1200_SW059_231215	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	<0.05	0.0	No Limit
ES2343823-001	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP231P: PFAS Sums (QC Lot: 5505201)									
ES2343723-009	1200_SW007_231215	EP231X: Sum of PFAS	----	0.01	µg/L	<0.01	<0.01	0.0	No Limit
EP231P: PFAS Sums (QC Lot: 5505220)									
ES2343723-011	1200_SW059_231215	EP231X: Sum of PFAS	----	0.01	µg/L	0.06	0.06	0.0	No Limit
ES2343823-001	Anonymous	EP231X: Sum of PFAS	----	0.01	µg/L	0.12	0.14	15.4	0% - 50%

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

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

Sub-Matrix: **WATER**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5505201)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.25 µg/L	89.1	72.0	130
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.25 µg/L	99.7	71.0	127
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	0.25 µg/L	99.9	68.0	131
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.25 µg/L	106	69.0	134
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.25 µg/L	102	65.0	140
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.25 µg/L	92.0	53.0	142
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5505220)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.25 µg/L	83.8	72.0	130
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.25 µg/L	86.4	71.0	127
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	0.25 µg/L	76.0	68.0	131
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.25 µg/L	93.9	69.0	134
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.25 µg/L	90.8	65.0	140
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.25 µg/L	102	53.0	142
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5505201)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	1.25 µg/L	102	73.0	129
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	0.25 µg/L	106	72.0	129
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	0.25 µg/L	109	72.0	129
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	0.25 µg/L	104	72.0	130
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	0.25 µg/L	110	71.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	0.25 µg/L	106	69.0	130
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	0.25 µg/L	102	71.0	129
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	0.25 µg/L	109	69.0	133
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	0.25 µg/L	112	72.0	134
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	0.25 µg/L	111	65.0	144
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	0.625 µg/L	97.9	71.0	132
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5505220)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	1.25 µg/L	79.8	73.0	129
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	0.25 µg/L	94.2	72.0	129
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	0.25 µg/L	86.5	72.0	129
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	0.25 µg/L	93.9	72.0	130

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report		
					Spike	Spike Recovery (%)	Acceptable Limits (%)
				Result	Concentration	LCS	Low	High
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5505220) - continued								
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	0.25 µg/L	97.8	71.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	0.25 µg/L	89.6	69.0	130
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	0.25 µg/L	80.9	71.0	129
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	0.25 µg/L	86.9	69.0	133
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	0.25 µg/L	107	72.0	134
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	0.25 µg/L	95.3	65.0	144
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	0.625 µg/L	90.8	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5505201)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.25 µg/L	102	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	0.625 µg/L	109	68.0	141
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	0.625 µg/L	100.0	62.6	147
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	0.625 µg/L	89.0	66.0	145
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	0.625 µg/L	104	57.6	145
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	0.25 µg/L	123	65.0	136
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	0.25 µg/L	100	61.0	135
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5505220)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.25 µg/L	78.0	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	0.625 µg/L	88.8	68.0	141
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	0.625 µg/L	94.3	62.6	147
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	0.625 µg/L	74.1	66.0	145
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	0.625 µg/L	94.2	57.6	145
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	0.25 µg/L	85.0	65.0	136
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	0.25 µg/L	90.8	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5505201)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.25 µg/L	115	63.0	143
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	0.25 µg/L	112	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	0.25 µg/L	116	67.0	138
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	0.25 µg/L	108	71.4	144

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Acceptable Limits (%): Low	Acceptable Limits (%): High
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5505220)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.25 µg/L	90.2	63.0	143
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	0.25 µg/L	73.7	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	0.25 µg/L	112	67.0	138
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	0.25 µg/L	97.4	71.4	144

Matrix Spike (MS) Report

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

Sub-Matrix: **WATER**

Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report: Spike Concentration	SpikeRecovery(%): MS	Acceptable Limits (%): Low	Acceptable Limits (%): High
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5505201)							
ES2343723-009	1200_SW007_231215	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.25 µg/L	93.9	72.0	130
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.25 µg/L	96.2	71.0	127
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.25 µg/L	103	68.0	131
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.25 µg/L	109	69.0	134
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.25 µg/L	102	65.0	140
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.25 µg/L	93.3	53.0	142
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5505220)							
ES2343723-011	1200_SW059_231215	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.25 µg/L	79.7	72.0	130
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.25 µg/L	81.6	71.0	127
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.25 µg/L	84.2	68.0	131
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.25 µg/L	87.8	69.0	134
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.25 µg/L	78.9	65.0	140
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.25 µg/L	81.3	53.0	142
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5505201)							
ES2343723-009	1200_SW007_231215	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	1.25 µg/L	107	73.0	129
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.25 µg/L	102	72.0	129
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.25 µg/L	113	72.0	129
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.25 µg/L	104	72.0	130
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.25 µg/L	113	71.0	133
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.25 µg/L	105	69.0	130
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.25 µg/L	108	71.0	129
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.25 µg/L	106	69.0	133
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.25 µg/L	107	72.0	134
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.25 µg/L	108	65.0	144
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.625 µg/L	105	71.0	132

Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5505220)							
ES2343723-011	1200_SW059_231215	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	1.25 µg/L	76.2	73.0	129
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.25 µg/L	93.5	72.0	129
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.25 µg/L	88.3	72.0	129
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.25 µg/L	88.3	72.0	130
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.25 µg/L	95.6	71.0	133
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.25 µg/L	92.1	69.0	130
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.25 µg/L	82.1	71.0	129
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.25 µg/L	88.7	69.0	133
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.25 µg/L	96.3	72.0	134
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.25 µg/L	84.2	65.0	144
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.625 µg/L	97.1	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5505201)							
ES2343723-009	1200_SW007_231215	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.25 µg/L	102	67.0	137
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.625 µg/L	104	68.0	141
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.625 µg/L	89.9	62.6	147
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.625 µg/L	116	66.0	145
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.625 µg/L	109	57.6	145
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.25 µg/L	117	65.0	136
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.25 µg/L	102	61.0	135
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5505220)							
ES2343723-011	1200_SW059_231215	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.25 µg/L	77.0	67.0	137
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.625 µg/L	87.0	68.0	141
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.625 µg/L	102	62.6	147
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.625 µg/L	75.9	66.0	145
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.625 µg/L	89.7	57.6	145
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.25 µg/L	78.9	65.0	136
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.25 µg/L	97.2	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5505201)							
ES2343723-009	1200_SW007_231215	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.25 µg/L	104	63.0	143

Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5505201) - continued							
ES2343723-009	1200_SW007_231215	EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.25 µg/L	106	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.25 µg/L	117	67.0	138
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.25 µg/L	95.4	71.4	144
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5505220)							
ES2343723-011	1200_SW059_231215	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.25 µg/L	79.2	63.0	143
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.25 µg/L	72.2	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.25 µg/L	82.5	67.0	138
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.25 µg/L	83.3	71.4	144

AEC006/231201 Am
Due: 8/12/23

CHAIN OF CUSTODY

ALS Environmental

ALS Laboratory: please tick →

☐ADELAIDE 21 Burma Road Pooraka SA 5095 Ph: 08 8359 0690 E: adelaide@alsglobal.com
☐BRISBANE 32 Shand Street Stafford QLD 4053 Ph: 07 3243 7222 E: samples.brisbane@alsglobal.com
☐GLADSTONE 46 Callemondah Drive Clinton QLD 4680 Ph: 07 7471 5600 E: gladstone@alsglobal.com
☐MACKAY 78 Harbour Road Mackay QLD 4749 Ph: 07 4944 0177 E: mackay@alsglobal.com
☐MELBOURNE 2-4 Westall Road Springvale VIC 3171 Ph: 03 8549 9600 E: samples.melbourne@alsglobal.com
☐MUDGEE 27 Sydney Road Mudgee NSW 2850 Ph: 02 6372 6735 E: mudgee.mail@alsglobal.com
☐NEWCASTLE 5/585 Maitland Rd Mayfield West NSW 2304 Ph: 02 4014 2500 E: samples.newcastle@alsglobal.com
☐NOWRA 4/13 Geary Place North Nowra NSW 2541 Ph: 024423 2063 E: nowra@alsglobal.com
☐PERTH 10 Hod Way Malaga WA 6090 Ph: 08 9209 7655 E: samples.perth@alsglobal.com
☐SYDNEY 277-289 Woodpark Road Smithfield NSW 2164 Ph: 02 8784 8555 E: samples.sydney@alsglobal.com
☐TOWNSVILLE 14-15 Desma Court Bohle QLD 4818 Ph: 07 4796 0600 E: townsville.environmental@alsglobal.com
☐WOLLONGONG 99 Kenny Street Wollongong NSW 2500 Ph: 02 4225 3125 E: portkembla@alsglobal.com

CLIENT: [redacted]
OFFICE: Darwin
PROJECT: NT_1200_PFASOMP_23
ORDER NUMBER: 60612561/2.1
PROJECT MANAGER [redacted]
SAMPLER: [redacted]
CONTACT PH:
SAMPLER MOBILE: [redacted]
[redacted]

TURNAROUND REQUIREMENTS: [redacted] Standard TAT (List due date):
(Standard TAT may be longer for some tests e.g. Ultra Trace Organics) ☐ Non Standard or urgent TAT (List due date):
ALS QUOTE NO.: SY/139/19 V3

COC SEQUENCE NUMBER (Circle)
COC: 1 2 3 4 5 6 7
OF: 1 2 3 4 5 6 7

FOR LABORATORY USE ONLY (Circle)
Custody Seal Intact? Yes No N/A
Free ice / frozen ice bricks present upon receipt? Yes No N/A
Random Sample Temperature on Receipt: °C
Other comment:

RE [redacted]
DAT 28/11/23 12:44 2:16 pm

RELINQUISHED BY: [redacted]
DATE/TIME: 24/11/23 1630

COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL:

ALS USE	SAMPLE DETAILS MATRIX: SOLID (S) WATER (W)			CONTAINER INFORMATION		ANALYSIS REQUIRED including SUITES (NB. Suite Codes must be listed to attract suite price) Where Metals are required, specify Total (unfiltered bottle required) or Dissolved (field filtered bottle required).	Additional Information
LAB ID	SAMPLE ID	DATE / TIME	MATRIX	TYPE & PRESERVATIVE (refer to codes below)	TOTAL CONTAINERS	EP231X Full PFAS	
1	1200-MW004D_231128	28/11/23 8:24	W	2x PFAS,	1	1	
2	1200_SW086_231128	9:31		2x PFAS,	1	1	
3	1200_SW123_231128	10:00			1	1	
4	1200_SW091_231128	10:25			1	1	
5	1200_QC100_231128			2x PFAS	1	1	
6	1200_QC200_231128			2x PFAS N23/025445	1	1	
7	1200_QC300_231128			2	1	1	
8	1200_QC400_231128				1	1	
	1200_QC500_231128				1	1	
				TOTAL	18		

Environmental Division Sydney
Work Order Reference
ES2341145

Telephone : +61-2-8784 8555

RECEIVED
01 DEC 2023
BY: AO 1550 C

Comments on likely contaminant levels, dilutions, or samples requiring specific QC analysis etc.

Please send to NMI Sydney

Subcon / Forward / Split WO
Lab / Analysis: NMI
Organised By / Date:
Relinquished By / Date:
Connote / Courier: QC FWD
WO No: ES2341145
Attach By PO / Internal Sheet:

LAB OF ORIGIN: DARWIN

Container Codes: P = Unpreserved Plastic; N = Nitric Preserved Plastic; ORC = Nitric Preserved ORC; SH = Sodium Hydroxide/Cd Preserved; S = Sodium Hydroxide Preserved Plastic; AG = Amber Glass Unpreserved; AP - Airfreight Unpreserved Plastic
VOA Vial HCl Preserved; VB = VOA Vial Sodium Bisulphate Preserved; VS = VOA Vial Sulfuric Preserved; AV = Airfreight Unpreserved Vial SG = Sulfuric Preserved Amber Glass; H = HCl preserved Plastic; HS = HCl preserved Speciation bottle; SP = Sulfuric Preserved Plastic; F = Formaldehyde Preserved Glass;
Zinc Acetate Preserved Bottle; E = EDTA Preserved Bottles; ST = Sterile Bottle; ASS = Plastic Bag for Acid Sulphate Soils; B = Unpreserved Bag.

Australian Government
Department of Industry, Science and Resources

National Measurement Institute

SAMPLE RECEIPT NOTIFICATION

CUSTOMER DETAILS

Attention: [redacted]

Customer:

Address:

Email:

Telephone:

LABORATORY DETAILS

Lab: National Measurement Institute

Contact: Client Services

Address: [redacted]

Email:

Telephone:

SAMPLE DETAILS

NMI Job Name: AECO06/231201

Total No. of Samples: 1

LRNs	Estimated Report Date	Customer Sample ID	Lab Sample Description
N23/025445	8-DEC-2023	1200_QC200_231128	WATER 28/11/2023

SAMPLE RECEIVED CONDITION

Date samples received:	1-DEC-2023
Sample received in good order:	Yes
NMI Quotation no. provided:	NT_1200_PFASOMP_23
Client purchase order number:	60612561/2_1
Temperature of samples:	Chilled
Comments:	
Mode of Delivery:	

Additional Terms and Conditions

Incomplete / unclear information about samples or required testing will delay the start of the analysis work.

If you require your Purchase Order (PO) number to be included on our invoice, please provide the number during sample submission and before the completion of work to avoid unnecessary delays and/or additional processing/handling fees.

Alterations to Client requirements requested after commencement of testing may incur charges.

The lodgement of an order or receipt of samples for NMI services referenced in this Sample Receipt Notification constitutes an acceptence of the current version of NMI Terms and Conditions or other applicable Terms referenced in the NMI Quotation. NMI Terms and Conditions are available on the web at https://www.industry.gov.au/client-services/testing-and-analysis-services/chemical-and-biological-analysis-services-terms-and-conditions

REPORT OF ANALYSIS

Report No. RN1413202

Client	[redacted]	**Job No.**	: AECO06/231201
		Quote No.	: QT-02232
		Order No.	: 60612561/2_1
		Date Received	: 1-DEC-2023
Attention		**Sampled By**	: CLIENT
Project Name : NT_1200_PFASOMP_23			
Your Client Services Manager : [redacted]		**Phone**	: [redacted]

Lab Reg No.	Sample Ref	Sample Description
N23/025445	1200_QC200_231128	WATER 28/11/2023

Lab Reg No.		N23/025445				
Date Sampled		28-NOV-2023				
	Units					Method
PFAS (per-and poly-fluoroalkyl substances)						
PFBA (375-22-4)	ug/L	<0.05				NR70
PFPeA (2706-90-3)	ug/L	<0.02				NR70
PFHxA (307-24-4)	ug/L	<0.01				NR70
PFHpA (375-85-9)	ug/L	<0.01				NR70
PFOA (335-67-1)	ug/L	<0.01				NR70
PFNA (375-95-1)	ug/L	<0.01				NR70
PFDA (335-76-2)	ug/L	<0.01				NR70
PFUdA (2058-94-8)	ug/L	<0.01				NR70
PFDoA (307-55-1)	ug/L	<0.01				NR70
PFTrDA (72629-94-8)	ug/L	<0.02				NR70
PFTeDA (376-06-7)	ug/L	<0.02				NR70
PFHxDA (67905-19-5)	ug/L	<0.02				NR70
PFODA (16517-11-6)	ug/L	<0.05				NR70
FOUEA (70887-84-2)	ug/L	<0.01				NR70
PFDS (335-77-3)	ug/L	<0.01				NR70
PFPeS (2706-91-4)	ug/L	<0.01				NR70
PFHxS (355-46-4)	ug/L	<0.01				NR70
PFHpS (375-92-8)	ug/L	<0.01				NR70
PFOS (1763-23-1)	ug/L	0.026				NR70
PFNS (68259-12-1)	ug/L	<0.01				NR70
PFBS (375-73-5)	ug/L	<0.01				NR70
PFOSA (754-91-6)	ug/L	<0.01				NR70
N-MeFOSA (31506-32-8)	ug/L	<0.02				NR70
N-EtFOSA (4151-50-2)	ug/L	<0.02				NR70
N-MeFOSAA (2355-31-9)	ug/L	<0.01				NR70
N-EtFOSAA(2991-50-6)	ug/L	<0.01				NR70
N-MeFOSE (24448-09-7)	ug/L	<0.05				NR70
N-EtFOSE (1691-99-2)	ug/L	<0.05				NR70
4:2 FTS (757124-72-4)	ug/L	<0.01				NR70
6:2 FTS (27619-97-2)	ug/L	<0.01				NR70

REPORT OF ANALYSIS

Lab Reg No.		N23/025445				
Date Sampled		28-NOV-2023				
	Units					Method
PFAS (per-and poly-fluoroalkyl substances)						
8:2 FTS (39108-34-4)	ug/L	<0.01				NR70
10:2 FTS (120226-60-0)	ug/L	<0.01				NR70
8:2 diPAP (678-41-1)	ug/L	<0.02				NR70
PFBA (Surrogate Recovery)	%	109				NR70
PFPeA (Surrogate Recovery)	%	106				NR70
PFHxA (Surrogate Recovery)	%	97				NR70
PFHpA (Surrogate Recovery)	%	99				NR70
PFOA (Surrogate Recovery)	%	108				NR70
PFNA (Surrogate Recovery)	%	101				NR70
PFDA (Surrogate Recovery)	%	103				NR70
PFUdA (Surrogate Recovery)	%	105				NR70
PFDoA (Surrogate Recovery)	%	104				NR70
PFTeDA (Surrogate Recovery)	%	98				NR70
PFHxDA (Surrogate Recovery)	%	125				NR70
FOUEA (Surrogate Recovery)	%	89				NR70
PFBS (Surrogate Recovery)	%	91				NR70
PFHxS (Surrogate Recovery)	%	106				NR70
PFOS (Surrogate Recovery)	%	95				NR70
PFOSA (Surrogate Recovery)	%	77				NR70
N-MeFOSA (Surrogate Recovery)	%	116				NR70
N-EtFOSA (Surrogate Recovery)	%	133				NR70
N-MeFOSAA (Surrogate Recovery)	%	92				NR70
N-EtFOSAA (Surrogate Recovery)	%	102				NR70
N-MeFOSE (Surrogate Recovery)	%	74				NR70
N-EtFOSE (Surrogate Recovery)	%	74				NR70
4:2 FTS (Surrogate Recovery)	%	167				NR70
6:2 FTS (Surrogate Recovery)	%	120				NR70
8:2 FTS (Surrogate Recovery)	%	101				NR70
8:2 diPAP (Surrogate Recovery)	%	143				NR70
Dates						
Date extracted		5-DEC-2023				
Date analysed		5-DEC-2023				

N23/025445
PFOS and PFHxS are quantified using a combined branched and linear standard,
linear and branched isomers are totalled for reporting.
All results corrected for labelled surrogate recoveries.

Selected PFAS surrogate recoveries are biased due to matrix effects.

REPORT OF ANALYSIS

High PFAS surrogate recoveries accepted - results corrected for recovery.

[redacted]

08-DEC-2023

NATA
WORLD RECOGNISED
ACCREDITATION

Accredited for compliance with ISO/IEC 17025 - Testing.
This report shall not be reproduced except in full.
Results relate only to the sample(s) as received and tested.

Measurement Uncertainty is available upon request.

Note: Sampling date(s) have been provided by the client.
The testing was undertaken at: 105 Delhi Road, North Ryde, NSW, 2113

Australian Government

National Measurement Institute

QUALITY ASSURANCE REPORT

Client: AECOM AUSTRALIA PTY LTD

NMI QA Report No: AECO06/231201 **Sample Matrix:** Liquid

Analyte	Method	LOR	Blank	Sample Duplicates			Recoveries	
				Sample	Duplicate	RPD	LCS	Matrix Spike
		ug/L	ug/L	ug/L	ug/L	%	%	%
PFBA (375-22-4)	NR70	0.05	<0.05	NA	NA	NA	121	NA
PFPeA (2706-90-3)	NR70	0.02	<0.02	NA	NA	NA	102	NA
PFHxA (307-24-4)	NR70	0.01	<0.01	NA	NA	NA	109	NA
PFHpA (375-85-9)	NR70	0.01	<0.01	NA	NA	NA	108	NA
PFOA (335-67-1)	NR70	0.01	<0.01	NA	NA	NA	112	NA
PFNA (375-95-1)	NR70	0.01	<0.01	NA	NA	NA	110	NA
PFDA (335-76-2)	NR70	0.01	<0.01	NA	NA	NA	102	NA
PFUdA (2058-94-8)	NR70	0.01	<0.01	NA	NA	NA	105	NA
PFDoA (307-55-1)	NR70	0.01	<0.01	NA	NA	NA	112	NA
PFTrDA (72629-94-8)	NR70	0.02	<0.02	NA	NA	NA	110	NA
PFTeDA (376-06-7)	NR70	0.02	<0.02	NA	NA	NA	98	NA
PFHxDA (67905-19-5)	NR70	0.02	<0.02	NA	NA	NA	99	NA
PFODA (16517-11-6)	NR70	0.05	<0.05	NA	NA	NA	115	NA
FOUEA (70887-84-2)	NR70	0.01	<0.01	NA	NA	NA	102	NA
PFBS (375-73-5)	NR70	0.01	<0.01	NA	NA	NA	105	NA
PFPeS (2706-91-4)	NR70	0.01	<0.01	NA	NA	NA	90	NA
PFHxS (355-46-4)	NR70	0.01	<0.01	NA	NA	NA	111	NA
PFHpS (375-92-8)	NR70	0.01	<0.01	NA	NA	NA	104	NA
PFOS (1763-23-1)	NR70	0.02	<0.02	NA	NA	NA	103	NA
PFNS (68259-12-1)	NR70	0.01	<0.01	NA	NA	NA	108	NA
PFDS (335-77-3)	NR70	0.01	<0.01	NA	NA	NA	111	NA
PFOSA (754-91-6)	NR70	0.01	<0.01	NA	NA	NA	109	NA
N-MeFOSA (31506-32-8)	NR70	0.02	<0.02	NA	NA	NA	99	NA
N-EtFOSA (4151-50-2)	NR70	0.02	<0.02	NA	NA	NA	85	NA
N-MeFOSAA (2355-31-9)	NR70	0.01	<0.01	NA	NA	NA	107	NA
N-EtFOSAA(2991-50-6)	NR70	0.01	<0.01	NA	NA	NA	103	NA
N-MeFOSE (24448-09-7)	NR70	0.05	<0.05	NA	NA	NA	94	NA
N-EtFOSE (1691-99-2)	NR70	0.05	<0.05	NA	NA	NA	96	NA
4:2 FTS (757124-72-4)	NR70	0.01	<0.01	NA	NA	NA	117	NA
6:2 FTS (27619-97-2)	NR70	0.01	<0.01	NA	NA	NA	114	NA
8:2 FTS (39108-34-4)	NR70	0.01	<0.01	NA	NA	NA	114	NA
10:2 FTS (120226-60-0)	NR70	0.01	<0.01	NA	NA	NA	106	NA
8:2 diPAP (678-41-1)	NR70	0.02	<0.02	NA	NA	NA	93	NA

Results expressed in percentage (%) or ug/L wherever appropriate.
Acceptable Spike recovery is 50-150%.
Maximum acceptable RPDs on spikes and duplicates is 40%.
'NA ' = Not Applicable.
RPD= Relative Percentage Difference.

Signed: [redacted]

Date:

[redacted]

From: [redacted]
Sent:
To:
Cc:
Subject:

OFFICIAL

CAUTION - This email originated from outside of the organisation. Do not click links or open attachments unless you recognise the sender and know the content is safe.

Hi [redacted]

For the first workorder W/O ES2343723- extra sample 1200_QC200_231211, if you only received 2 sets of bottles, the one that is written 1200_QC200_231211 on the bottle is the correspondent to the sample -004 on the COC, the end number was written in incorrectly. Please analyse the sample for PFAS for both samples as requested by [redacted]

Thanks for your help! Please let me know if you need any additional information.

Kind regards

[redacted]

Australian Government
Department of Industry, Science and Resources

National Measurement Institute

SAMPLE RECEIPT NOTIFICATION

CUSTOMER DETAILS

Attention: [redacted]

Customer:

Address:

Email:

Telephone:

LABORATORY DETAILS

Lab: National Measurement Institute

Contact: Client Services

Address: [redacted]

Email:

Telephone:

SAMPLE DETAILS

NMI Job Name: AECO06/231220/4

Total No. of Samples: 2

LRNs	Estimated Report Date	Customer Sample ID	Lab Sample Description
N23/027138	5-JAN-2024	1200_QC200_231215	WATER 15/12/2023 16:45
N23/027139	5-JAN-2024	1200_QC200_231211	WATER 11/12/2023

SAMPLE RECEIVED CONDITION

Date samples received:	20-DEC-2023
Sample received in good order:	Yes
NMI Quotation no. provided:	NT_1200_PFASOMP_23
Client purchase order number:	60612561_2_1
Temperature of samples:	Chilled
Comments:	
Mode of Delivery:	

Additional Terms and Conditions

Incomplete / unclear information about samples or required testing will delay the start of the analysis work.

If you require your Purchase Order (PO) number to be included on our invoice, please provide the number during sample submission and before the completion of work to avoid unnecessary delays and/or additional processing/handling fees.

Alterations to Client requirements requested after commencement of testing may incur charges.

The lodgement of an order or receipt of samples for NMI services referenced in this Sample Receipt Notification constitutes an acceptence of the current version of NMI Terms and Conditions or other applicable Terms referenced in the NMI Quotation. NMI Terms and Conditions are available on the web at https://www.industry.gov.au/client-services/testing-and-analysis-services/chemical-and-biological-analysis-services-terms-and-conditions

Australian Government

National Measurement Institute

QUALITY ASSURANCE REPORT

Client: AECOM AUSTRALIA PTY LTD

NMI QA Report No: AECO06/231220/4 **Sample Matrix:** Liquid

Analyte	Method	LOR	Blank	Sample Duplicates			Recoveries	
				Sample	Duplicate	RPD	LCS	Matrix Spike
		ug/L	ug/L	ug/L	ug/L	%	%	%
PFBA (375-22-4)	NR70	0.05	<0.05	NA	NA	NA	106	NA
PFPeA (2706-90-3)	NR70	0.02	<0.02	NA	NA	NA	104	NA
PFHxA (307-24-4)	NR70	0.01	<0.01	NA	NA	NA	102	NA
PFHpA (375-85-9)	NR70	0.01	<0.01	NA	NA	NA	108	NA
PFOA (335-67-1)	NR70	0.01	<0.01	NA	NA	NA	107	NA
PFNA (375-95-1)	NR70	0.01	<0.01	NA	NA	NA	110	NA
PFDA (335-76-2)	NR70	0.01	<0.01	NA	NA	NA	107	NA
PFUdA (2058-94-8)	NR70	0.01	<0.01	NA	NA	NA	106	NA
PFDoA (307-55-1)	NR70	0.01	<0.01	NA	NA	NA	112	NA
PFTrDA (72629-94-8)	NR70	0.02	<0.02	NA	NA	NA	102	NA
PFTeDA (376-06-7)	NR70	0.02	<0.02	NA	NA	NA	104	NA
PFHxDA (67905-19-5)	NR70	0.02	<0.02	NA	NA	NA	100	NA
PFODA (16517-11-6)	NR70	0.05	<0.05	NA	NA	NA	102	NA
FOUEA (70887-84-2)	NR70	0.01	<0.01	NA	NA	NA	103	NA
PFBS (375-73-5)	NR70	0.01	<0.01	NA	NA	NA	104	NA
PFPeS (2706-91-4)	NR70	0.01	<0.01	NA	NA	NA	103	NA
PFHxS (355-46-4)	NR70	0.01	<0.01	NA	NA	NA	113	NA
PFHpS (375-92-8)	NR70	0.01	<0.01	NA	NA	NA	105	NA
PFOS (1763-23-1)	NR70	0.02	<0.02	NA	NA	NA	109	NA
PFNS (68259-12-1)	NR70	0.01	<0.01	NA	NA	NA	114	NA
PFDS (335-77-3)	NR70	0.01	<0.01	NA	NA	NA	108	NA
PFOSA (754-91-6)	NR70	0.01	<0.01	NA	NA	NA	113	NA
N-MeFOSA (31506-32-8)	NR70	0.02	<0.02	NA	NA	NA	96	NA
N-EtFOSA (4151-50-2)	NR70	0.02	<0.02	NA	NA	NA	93	NA
N-MeFOSAA (2355-31-9)	NR70	0.01	<0.01	NA	NA	NA	114	NA
N-EtFOSAA(2991-50-6)	NR70	0.01	<0.01	NA	NA	NA	99	NA
N-MeFOSE (24448-09-7)	NR70	0.05	<0.05	NA	NA	NA	90	NA
N-EtFOSE (1691-99-2)	NR70	0.05	<0.05	NA	NA	NA	100	NA
4:2 FTS (757124-72-4)	NR70	0.01	<0.01	NA	NA	NA	108	NA
6:2 FTS (27619-97-2)	NR70	0.01	<0.01	NA	NA	NA	95	NA
8:2 FTS (39108-34-4)	NR70	0.01	<0.01	NA	NA	NA	118	NA
10:2 FTS (120226-60-0)	NR70	0.01	<0.01	NA	NA	NA	115	NA
8:2 diPAP (678-41-1)	NR70	0.02	<0.02	NA	NA	NA	88	NA

Results expressed in percentage (%) or ug/L wherever appropriate.
Acceptable Spike recovery is 50-150%.
Maximum acceptable RPDs on spikes and duplicates is 40%.
'NA ' = Not Applicable.
RPD= Relative Percentage Difference.

Signed: [redacted]

Date:

REPORT OF ANALYSIS

Lab Reg No.		N23/027139	N23/027138			
Date Sampled		11-DEC-2023	15-DEC-2023			
	Units					Method
PFAS (per-and poly-fluoroalkyl substances)						
6:2 FTS (27619-97-2)	ug/L	<0.01	<0.01			NR70
8:2 FTS (39108-34-4)	ug/L	<0.01	<0.01			NR70
10:2 FTS (120226-60-0)	ug/L	<0.01	<0.01			NR70
8:2 diPAP (678-41-1)	ug/L	<0.02	<0.02			NR70
PFBA (Surrogate Recovery)	%	87	89			NR70
PFPeA (Surrogate Recovery)	%	81	86			NR70
PFHxA (Surrogate Recovery)	%	89	87			NR70
PFHpA (Surrogate Recovery)	%	87	87			NR70
PFOA (Surrogate Recovery)	%	90	90			NR70
PFNA (Surrogate Recovery)	%	83	91			NR70
PFDA (Surrogate Recovery)	%	83	90			NR70
PFUdA (Surrogate Recovery)	%	74	74			NR70
PFDoA (Surrogate Recovery)	%	64	67			NR70
PFTeDA (Surrogate Recovery)	%	56	67			NR70
PFHxDA (Surrogate Recovery)	%	71	68			NR70
FOUEA (Surrogate Recovery)	%	75	74			NR70
PFBS (Surrogate Recovery)	%	87	88			NR70
PFHxS (Surrogate Recovery)	%	91	97			NR70
PFOS (Surrogate Recovery)	%	94	94			NR70
PFOSA (Surrogate Recovery)	%	68	74			NR70
N-MeFOSA (Surrogate Recovery)	%	54	65			NR70
N-EtFOSA (Surrogate Recovery)	%	53	58			NR70
N-MeFOSAA (Surrogate Recovery)	%	65	76			NR70
N-EtFOSAA (Surrogate Recovery)	%	58	75			NR70
N-MeFOSE (Surrogate Recovery)	%	73	76			NR70
N-EtFOSE (Surrogate Recovery)	%	53	57			NR70
4:2 FTS (Surrogate Recovery)	%	90	103			NR70
6:2 FTS (Surrogate Recovery)	%	73	88			NR70
8:2 FTS (Surrogate Recovery)	%	87	118			NR70
8:2 diPAP (Surrogate Recovery)	%	94	100			NR70
Dates						
Date extracted		2-JAN-2024	2-JAN-2024			
Date analysed		3-JAN-2024	3-JAN-2024			

N23/027138
to
N23/027139
PFOS and PFHxS are quantified using a combined branched and linear standard,
linear and branched isomers are totalled for reporting.

REPORT OF ANALYSIS

All results corrected for labelled surrogate recoveries.

[redacted]

NATA
WORLD RECOGNISED
ACCREDITATION

Accredited for compliance with ISO/IEC 17025 - Testing.
This report shall not be reproduced except in full.
Results relate only to the sample(s) as received and tested.

Measurement Uncertainty is available upon request.

Note: Sampling date(s) have been provided by the client.
The testing was undertaken at: 105 Delhi Road, North Ryde, NSW, 2113

REPORT OF ANALYSIS

Report No. RN1415098

Client	[redacted]	**Job No.**	: AECO06/231220/4
		Quote No.	: QT-02232
		Order No.	: 60612561_2_1
		Date Received	: 20-DEC-2023
Attention	:	**Sampled By**	: CLIENT
Project Name	: NT_1200_PFASOMP_23		
Your Client Services Manager	: [redacted]	**Phone**	: [redacted]

Lab Reg No.	Sample Ref	Sample Description
N23/027139	1200_QC200_231211	WATER 11/12/2023
N23/027138	1200_QC200_231215	WATER 15/12/2023 16:45

Lab Reg No.		N23/027139	N23/027138			
Date Sampled		11-DEC-2023	15-DEC-2023			
	Units					Method
PFAS (per-and poly-fluoroalkyl substances)						
PFBA (375-22-4)	ug/L	<0.05	<0.05			NR70
PFPeA (2706-90-3)	ug/L	<0.02	<0.02			NR70
PFHxA (307-24-4)	ug/L	<0.01	<0.01			NR70
PFHpA (375-85-9)	ug/L	<0.01	<0.01			NR70
PFOA (335-67-1)	ug/L	<0.01	<0.01			NR70
PFNA (375-95-1)	ug/L	<0.01	<0.01			NR70
PFDA (335-76-2)	ug/L	<0.01	<0.01			NR70
PFUdA (2058-94-8)	ug/L	<0.01	<0.01			NR70
PFDoA (307-55-1)	ug/L	<0.01	<0.01			NR70
PFTrDA (72629-94-8)	ug/L	<0.02	<0.02			NR70
PFTeDA (376-06-7)	ug/L	<0.02	<0.02			NR70
PFHxDA (67905-19-5)	ug/L	<0.02	<0.02			NR70
PFODA (16517-11-6)	ug/L	<0.05	<0.05			NR70
FOUEA (70887-84-2)	ug/L	<0.01	<0.01			NR70
PFDS (335-77-3)	ug/L	<0.01	<0.01			NR70
PFPeS (2706-91-4)	ug/L	<0.01	<0.01			NR70
PFHxS (355-46-4)	ug/L	0.011	<0.01			NR70
PFHpS (375-92-8)	ug/L	<0.01	<0.01			NR70
PFOS (1763-23-1)	ug/L	0.065	<0.02			NR70
PFNS (68259-12-1)	ug/L	<0.01	<0.01			NR70
PFBS (375-73-5)	ug/L	<0.01	<0.01			NR70
PFOSA (754-91-6)	ug/L	<0.01	<0.01			NR70
N-MeFOSA (31506-32-8)	ug/L	<0.02	<0.02			NR70
N-EtFOSA (4151-50-2)	ug/L	<0.02	<0.02			NR70
N-MeFOSAA (2355-31-9)	ug/L	<0.01	<0.01			NR70
N-EtFOSAA(2991-50-6)	ug/L	<0.01	<0.01			NR70
N-MeFOSE (24448-09-7)	ug/L	<0.05	<0.05			NR70
N-EtFOSE (1691-99-2)	ug/L	<0.05	<0.05			NR70
4:2 FTS (757124-72-4)	ug/L	<0.01	<0.01			NR70

SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order	: **ES2408291**		
Client	[redacted]	Laboratory	[redacted]
Contact		Contact	
Address		Address	
E-mail		E-mail	
Telephone		Telephone	
Facsimile	: ----	Facsimile	
Project	: NT_1200_PFASOMP_24	Page	: 1 of 3
Order number	: 60612561/2.2	Quote number	: ES2019AECOMAU0030 (SY/139/19 V3)
C-O-C number	: 64642	QC Level	: NEPM 2013 B3 & ALS QC Standard
Site	: Robertson Barracks		
Sampler	: [redacted]		

Dates

Date Samples Received	: 14-Mar-2024 08:30	Issue Date	: 14-Mar-2024
Client Requested Due Date	: 21-Mar-2024	Scheduled Reporting Date	: **21-Mar-2024**

Delivery Details

Mode of Delivery	: Client Drop Off	Security Seal	: Not Available
No. of coolers/boxes	: 1	Temperature	: 9.8'C DRW 11.9'C 12.2'C 13.9'C SYD - Ice present
Receipt Detail	:	No. of samples received / analysed	: 38 / 38

General Comments

- This report contains the following information:
  - Sample Container(s)/Preservation Non-Compliances
  - Summary of Sample(s) and Requested Analysis
  - Proactive Holding Time Report
  - Requested Deliverables
- **Several samples received extra and not logged.**
- **Please refer to the Proactive Holding Time Report table below which summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory. The laboratory will process these samples unless instructions are received from you indicating you do not wish to proceed. The absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.**
- **QC Forward analysis will be conducted by NMI.**
- Please direct any queries you have regarding this work order to the above ALS laboratory contact.
- Analytical work for this work order will be conducted at ALS Sydney.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months ± 1 week) from receipt of samples.
- Please be aware that APHA/NEPM recommends water and soil samples be chilled to less than or equal to 6°C for chemical analysis, and less than or equal to 10°C but unfrozen for Microbiological analysis. Where samples are received above this temperature, it should be taken into consideration when interpreting results. Refer to ALS EnviroMail 85 for ALS recommendations of the best practice for chilling samples after sampling and for maintaining a cool temperature during transit.

Sample Container(s)/Preservation Non-Compliances

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

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

Summary of Sample(s) and Requested Analysis

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

Matrix: **WATER**

Laboratory sample ID	*Sampling date / time*	*Sample ID*	WATER - EP231X PFAS - Full Suite (28 analytes)
ES2408291-001	11-Mar-2024 09:38	1200_MW001_240306	✓
ES2408291-002	05-Mar-2024 13:51	1200_MW004_240305	✓
ES2408291-003	05-Mar-2024 14:08	1200_MW004D_240305	✓
ES2408291-004	12-Mar-2024 11:02	1200_MW012_240312	✓
ES2408291-005	01-Mar-2024 10:10	1200_MW018_240301	✓
ES2408291-006	01-Mar-2024 10:12	1200_MW021_240301	✓
ES2408291-007	01-Mar-2024 10:13	1200_MW021D_240301	✓
ES2408291-008	01-Mar-2024 10:11	1200_MW023_240301	✓
ES2408291-009	08-Mar-2024 10:06	1200_MW029_240308	✓
ES2408291-010	08-Mar-2024 09:37	1200_MW030_240308	✓
ES2408291-011	08-Mar-2024 09:38	1200_MW031_240308	✓
ES2408291-012	11-Mar-2024 09:35	1200_MW032_240307	✓
ES2408291-013	12-Mar-2024 15:15	1200_MW034_240312	✓
ES2408291-014	12-Mar-2024 11:02	1200_MW066_240307	✓
ES2408291-015	05-Mar-2024 14:53	1200_MW080_240305	✓
ES2408291-016	05-Mar-2024 13:29	1200_MW112_240305	✓
ES2408291-017	05-Mar-2024 13:29	1200_MW113_240305	✓
ES2408291-018	05-Mar-2024 14:08	1200_QC100_240305	✓
ES2408291-019	05-Mar-2024 14:09	1200_QC200_240305	✓
ES2408291-020	12-Mar-2024 11:02	1200_QC300_240301	✓
ES2408291-021	12-Mar-2024 11:02	1200_QC400_240301	✓
ES2408291-022	12-Mar-2024 11:02	1200_QC500_240301	✓
ES2408291-023	07-Mar-2024 08:24	1200_QC101_240312	✓
ES2408291-024	12-Mar-2024 08:25	1200_QC201_240312	✓
ES2408291-025	12-Mar-2024 11:02	1200_QC301_240305	✓
ES2408291-026	12-Mar-2024 11:02	1200_QC401_240305	✓
ES2408291-027	05-Mar-2024 16:09	1200_SW023_240305	✓
ES2408291-028	05-Mar-2024 16:46	1200_SW028_240305	✓
ES2408291-029	06-Mar-2024 08:34	1200_SW007_240306	✓
ES2408291-030	07-Mar-2024 08:24	1200_SW059_240307	✓
ES2408291-031	12-Mar-2024 11:02	1200_QC302_240306	✓
ES2408291-032	12-Mar-2024 11:02	1200_QC402_240306	✓
ES2408291-033	12-Mar-2024 11:02	1200_QC303_240307	✓
ES2408291-034	12-Mar-2024 11:02	1200_QC403_240307	✓
ES2408291-035	01-Mar-2024 10:16	1200_SW123_240301	✓

			WATER - EP231X PFAS - Full Suite (28 analytes)
ES2408291-036	01-Mar-2024 10:17	1200_SW086_240301	✓
ES2408291-037	01-Mar-2024 10:18	1200_SW091_240301	✓
ES2408291-038	12-Mar-2024 11:03	1200_MW012D_240312	✓

Proactive Holding Time Report

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

Requested Deliverables

[redacted]

CERTIFICATE OF ANALYSIS

Work Order	: **ES2408291**	Page	: 1 of 19
Amendment	: **1**		
Client	[redacted]	Laboratory	: Environmental Division Sydney
Contact		Contact	[redacted]
Address		Address	
Telephone		Telephone	
Project	: NT_1200_PFASOMP_24	Date Samples Received	: 14-Mar-2024 08:30
Order number	: 60612561/2.2	Date Analysis Commenced	: 15-Mar-2024
C-O-C number	: 64642	Issue Date	: 22-Mar-2024 08:18
Sampler	: [redacted]		
Site	: Robertson Barracks		
Quote number	: SY/139/19 V3		
No. of samples received	: 36		
No. of samples analysed	: 36		

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

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

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

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

Signatories

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

Signatories	*Position*	*Accreditation Category*
[redacted]		

General Comments

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

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

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

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

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

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

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

- EP231X - Per- and Polyfluoroalkyl Substances (PFAS): Samples received in 20mL or 125mL bottles have been tested in accordance with the QSM5.4 compliant, NATA accredited method. 60mL or 250mL bottles have been tested to the legacy QSM 5.1 aligned, NATA accredited method.
- Amendment (22/03/2024): This report has been amended as a result of a request to change sampling dates received from Tiane McQuire on 21/03/24, for samples 20-23, 25, 26, 31-34. All analysis results are as per the previous report.
- EP231: Stable isotope enriched internal standards are added to samples prior to extraction. Target compounds have a direct analogous internal standard with the exception of PFPeS, PFHpA, PFDS, PFTrDA and 10:2 FTS. These compounds use an internal standard that is chemically related and has a retention time close to that of the target compound. The DQO for internal standard response is 50-150% of that established at initial calibration or as per tables in USEPA 1633 where listed. PFOS is quantified using a certified, traceable standard consisting of linear and branched PFOS isomers. These practices are in line with recommendations in the National Environmental Management Plan for PFAS and also conform to QSM 5.4 (US DoD) requirements.

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	1200_MW001_240306	1200_MW004_240305	1200_MW004D_240305	1200_MW012_240312	1200_MW018_240301
				Sampling date / time	11-Mar-2024 09:38	05-Mar-2024 13:51	05-Mar-2024 14:08	12-Mar-2024 11:02	01-Mar-2024 10:10
Compound	CAS Number	LOR	Unit		ES2408291-001	ES2408291-002	ES2408291-003	ES2408291-004	ES2408291-005
					Result	Result	Result	Result	Result
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		**0.04**	**0.05**	<0.01	<0.01	<0.01
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		**0.09**	**0.08**	<0.01	<0.01	<0.01
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		<0.1	<0.1	<0.1	<0.1	<0.1
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	1200_MW001_240306	1200_MW004_240305	1200_MW004D_240305	1200_MW012_240312	1200_MW018_240301
				Sampling date / time	11-Mar-2024 09:38	05-Mar-2024 13:51	05-Mar-2024 14:08	12-Mar-2024 11:02	01-Mar-2024 10:10
Compound	CAS Number	LOR	Unit		ES2408291-001	ES2408291-002	ES2408291-003	ES2408291-004	ES2408291-005
					Result	Result	Result	Result	Result
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L		**0.13**	**0.13**	<0.01	<0.01	<0.01
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		**0.13**	**0.13**	<0.01	<0.01	<0.01
Sum of PFAS (WA DER List)	----	0.01	µg/L		**0.13**	**0.13**	<0.01	<0.01	<0.01
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**111**	**98.9**	**102**	**106**	**108**
13C8-PFOA	----	0.02	%		**102**	**106**	**104**	**107**	**101**

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	1200_MW021_240301	1200_MW021D_240301	1200_MW023_240301	1200_MW029_240308	1200_MW030_240308
				Sampling date / time	01-Mar-2024 10:12	01-Mar-2024 10:13	01-Mar-2024 10:11	08-Mar-2024 10:06	08-Mar-2024 09:37
Compound	CAS Number	LOR	Unit		ES2408291-006	ES2408291-007	ES2408291-008	ES2408291-009	ES2408291-010
					Result	Result	Result	Result	Result
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	**0.04**
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		<0.01	**0.03**	<0.01	<0.01	**0.07**
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		<0.1	<0.1	<0.1	<0.1	<0.1
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	1200_MW021_240301	1200_MW021D_240301	1200_MW023_240301	1200_MW029_240308	1200_MW030_240308
				Sampling date / time	01-Mar-2024 10:12	01-Mar-2024 10:13	01-Mar-2024 10:11	08-Mar-2024 10:06	08-Mar-2024 09:37
Compound	CAS Number	LOR	Unit		ES2408291-006	ES2408291-007	ES2408291-008	ES2408291-009	ES2408291-010
					Result	Result	Result	Result	Result
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L		<0.01	**0.03**	<0.01	<0.01	**0.11**
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		<0.01	**0.03**	<0.01	<0.01	**0.11**
Sum of PFAS (WA DER List)	----	0.01	µg/L		<0.01	**0.03**	<0.01	<0.01	**0.11**
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**103**	**94.1**	**115**	**110**	**110**
13C8-PFOA	----	0.02	%		**100.0**	**107**	**110**	**103**	**97.8**

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	1200_MW031_240308	1200_MW032_240307	1200_MW034_240312	1200_MW066_240307	1200_MW080_240305
				Sampling date / time	08-Mar-2024 09:38	11-Mar-2024 09:35	12-Mar-2024 15:15	12-Mar-2024 11:02	05-Mar-2024 14:53
Compound	CAS Number	LOR	Unit		ES2408291-011	ES2408291-012	ES2408291-013	ES2408291-014	ES2408291-015
					Result	Result	Result	Result	Result
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		<0.02	<0.02	<0.02	**0.03**	<0.02
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		<0.02	<0.02	<0.02	**0.03**	<0.02
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		<0.01	**0.02**	**0.03**	**0.18**	<0.01
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		<0.01	**0.04**	**0.10**	**0.16**	**0.03**
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		<0.1	<0.1	<0.1	<0.1	<0.1
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		<0.02	<0.02	**0.03**	**0.02**	<0.02
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		<0.02	<0.02	**0.04**	**0.07**	<0.02
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		<0.01	<0.01	<0.01	**0.02**	<0.01
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	1200_MW031_240308	1200_MW032_240307	1200_MW034_240312	1200_MW066_240307	1200_MW080_240305
				Sampling date / time	08-Mar-2024 09:38	11-Mar-2024 09:35	12-Mar-2024 15:15	12-Mar-2024 11:02	05-Mar-2024 14:53
Compound	CAS Number	LOR	Unit		ES2408291-011	ES2408291-012	ES2408291-013	ES2408291-014	ES2408291-015
					Result	Result	Result	Result	Result
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L		<0.01	**0.06**	**0.20**	**0.51**	**0.03**
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		<0.01	**0.06**	**0.13**	**0.34**	**0.03**
Sum of PFAS (WA DER List)	----	0.01	µg/L		<0.01	**0.06**	**0.20**	**0.48**	**0.03**
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**99.9**	**109**	**113**	**111**	**109**
13C8-PFOA	----	0.02	%		**109**	**105**	**104**	**103**	**110**

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	1200_MW112_240305	1200_MW113_240305	1200_QC100_240305	1200_QC300_240301	1200_QC400_240301
				Sampling date / time	05-Mar-2024 13:29	05-Mar-2024 13:29	05-Mar-2024 14:08	01-Mar-2024 11:02	01-Mar-2024 11:02
Compound	CAS Number	LOR	Unit		ES2408291-016	ES2408291-017	ES2408291-018	ES2408291-020	ES2408291-021
					Result	Result	Result	Result	Result
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		<0.1	<0.1	<0.1	<0.1	<0.1
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	1200_MW112_240305	1200_MW113_240305	1200_QC100_240305	1200_QC300_240301	1200_QC400_240301
				Sampling date / time	05-Mar-2024 13:29	05-Mar-2024 13:29	05-Mar-2024 14:08	01-Mar-2024 11:02	01-Mar-2024 11:02
Compound	CAS Number	LOR	Unit		ES2408291-016	ES2408291-017	ES2408291-018	ES2408291-020	ES2408291-021
					Result	Result	Result	Result	Result
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Sum of PFAS (WA DER List)	----	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**111**	**102**	**97.8**	**102**	**112**
13C8-PFOA	----	0.02	%		**103**	**104**	**101**	**109**	**113**

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	1200_QC500_240301	1200_QC101_240312	1200_QC301_240305	1200_QC401_240305	1200_SW023_240305
				Sampling date / time	01-Mar-2024 11:02	12-Mar-2024 08:24	05-Mar-2024 11:02	05-Mar-2024 11:02	05-Mar-2024 16:09
Compound	CAS Number	LOR	Unit		ES2408291-022	ES2408291-023	ES2408291-025	ES2408291-026	ES2408291-027
					Result	Result	Result	Result	Result
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		<0.01	**0.03**	<0.01	<0.01	<0.01
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		<0.01	**0.10**	<0.01	<0.01	<0.01
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		<0.1	<0.1	<0.1	<0.1	<0.1
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		<0.02	**0.04**	<0.02	<0.02	<0.02
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		<0.02	**0.04**	<0.02	<0.02	<0.02
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	1200_QC500_240301	1200_QC101_240312	1200_QC301_240305	1200_QC401_240305	1200_SW023_240305
				Sampling date / time	01-Mar-2024 11:02	12-Mar-2024 08:24	05-Mar-2024 11:02	05-Mar-2024 11:02	05-Mar-2024 16:09
Compound	CAS Number	LOR	Unit		ES2408291-022	ES2408291-023	ES2408291-025	ES2408291-026	ES2408291-027
					Result	Result	Result	Result	Result
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L		<0.01	**0.21**	<0.01	<0.01	<0.01
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		<0.01	**0.13**	<0.01	<0.01	<0.01
Sum of PFAS (WA DER List)	----	0.01	µg/L		<0.01	**0.21**	<0.01	<0.01	<0.01
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**110**	**113**	**119**	**109**	**107**
13C8-PFOA	----	0.02	%		**112**	**108**	**109**	**113**	**113**

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	1200_SW028_240305	1200_SW007_240306	1200_SW059_240307	1200_QC302_240306	1200_QC402_240306
				Sampling date / time	05-Mar-2024 16:46	06-Mar-2024 08:34	07-Mar-2024 08:24	06-Mar-2024 11:02	06-Mar-2024 11:02
Compound	CAS Number	LOR	Unit		ES2408291-028	ES2408291-029	ES2408291-030	ES2408291-031	ES2408291-032
					Result	Result	Result	Result	Result
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		<0.01	<0.01	**0.05**	<0.01	<0.01
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		<0.01	<0.01	**0.14**	<0.01	<0.01
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		<0.1	<0.1	<0.1	<0.1	<0.1
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		<0.02	<0.02	**0.02**	<0.02	<0.02
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	1200_SW028_240305	1200_SW007_240306	1200_SW059_240307	1200_QC302_240306	1200_QC402_240306
				Sampling date / time	05-Mar-2024 16:46	06-Mar-2024 08:34	07-Mar-2024 08:24	06-Mar-2024 11:02	06-Mar-2024 11:02
Compound	CAS Number	LOR	Unit		ES2408291-028	ES2408291-029	ES2408291-030	ES2408291-031	ES2408291-032
					Result	Result	Result	Result	Result
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L		<0.01	<0.01	**0.21**	<0.01	<0.01
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		<0.01	<0.01	**0.19**	<0.01	<0.01
Sum of PFAS (WA DER List)	----	0.01	µg/L		<0.01	<0.01	**0.21**	<0.01	<0.01
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**112**	**99.0**	**111**	**109**	**111**
13C8-PFOA	----	0.02	%		**111**	**113**	**114**	**111**	**110**

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	1200_QC303_240307	1200_QC403_240307	1200_SW123_240301	1200_SW086_240301	1200_SW091_240301
				Sampling date / time	07-Mar-2024 11:02	07-Mar-2024 11:02	01-Mar-2024 10:16	01-Mar-2024 10:17	01-Mar-2024 10:18
Compound	CAS Number	LOR	Unit		ES2408291-033	ES2408291-034	ES2408291-035	ES2408291-036	ES2408291-037
					Result	Result	Result	Result	Result
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		<0.01	<0.01	**0.04**	<0.01	<0.01
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		<0.01	<0.01	**0.12**	<0.01	**0.01**
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		<0.1	<0.1	<0.1	<0.1	<0.1
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	1200_QC303_240307	1200_QC403_240307	1200_SW123_240301	1200_SW086_240301	1200_SW091_240301
				Sampling date / time	07-Mar-2024 11:02	07-Mar-2024 11:02	01-Mar-2024 10:16	01-Mar-2024 10:17	01-Mar-2024 10:18
Compound	CAS Number	LOR	Unit		ES2408291-033	ES2408291-034	ES2408291-035	ES2408291-036	ES2408291-037
					Result	Result	Result	Result	Result
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L		<0.01	<0.01	**0.16**	<0.01	**0.01**
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		<0.01	<0.01	**0.16**	<0.01	**0.01**
Sum of PFAS (WA DER List)	----	0.01	µg/L		<0.01	<0.01	**0.16**	<0.01	**0.01**
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**113**	**116**	**114**	**101**	**104**
13C8-PFOA	----	0.02	%		**110**	**107**	**109**	**111**	**112**

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	1200_MW012D_240312	----	----	----	----
				Sampling date / time	12-Mar-2024 11:03	----	----	----	----
Compound	CAS Number	LOR	Unit		ES2408291-038	--------	--------	--------	--------
					Result	----	----	----	----
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		<0.02	----	----	----	----
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		<0.02	----	----	----	----
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		<0.01	----	----	----	----
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		<0.02	----	----	----	----
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		<0.01	----	----	----	----
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	----	----	----	----
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		<0.1	----	----	----	----
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		<0.02	----	----	----	----
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		<0.02	----	----	----	----
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		<0.02	----	----	----	----
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		<0.01	----	----	----	----
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		<0.02	----	----	----	----
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L		<0.02	----	----	----	----
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L		<0.02	----	----	----	----
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L		<0.02	----	----	----	----
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L		<0.02	----	----	----	----
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		<0.05	----	----	----	----
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L		<0.02	----	----	----	----
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L		<0.05	----	----	----	----

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	1200_MW012D_240312	----	----	----	----
				Sampling date / time	12-Mar-2024 11:03	----	----	----	----
Compound	CAS Number	LOR	Unit		ES2408291-038	--------	--------	--------	--------
					Result	----	----	----	----
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L		<0.05	----	----	----	----
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L		<0.05	----	----	----	----
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L		<0.05	----	----	----	----
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L		<0.02	----	----	----	----
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L		<0.02	----	----	----	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L		<0.05	----	----	----	----
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		<0.05	----	----	----	----
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		<0.05	----	----	----	----
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L		<0.05	----	----	----	----
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L		<0.01	----	----	----	----
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		<0.01	----	----	----	----
Sum of PFAS (WA DER List)	----	0.01	µg/L		<0.01	----	----	----	----
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**109**	----	----	----	----
13C8-PFOA	----	0.02	%		**116**	----	----	----	----

Surrogate Control Limits

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

QUALITY CONTROL REPORT

Work Order	: **ES2408291**	Page	: 1 of 14
Amendment	: **1**		
Client	[redacted]	Laboratory	: Environmental Division Sydney
Contact		Contact	:
Address		Address	:
Telephone		Telephone	:
Project	: NT_1200_PFASOMP_24	Date Samples Received	: 14-Mar-2024
Order number	: 60612561/2.2	Date Analysis Commenced	: 15-Mar-2024
C-O-C number	: 64642	Issue Date	: 22-Mar-2024
Sampler	: [redacted]		
Site	: Robertson Barracks		
Quote number	: SY/139/19 V3		
No. of samples received	: 36		
No. of samples analysed	: 36		

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

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

This Quality Control Report contains the following information:

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

Signatories

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

Signatories	*Position*	*Accreditation Category*
[redacted]		

General Comments

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

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

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

Key : Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot
CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
RPD = Relative Percentage Difference
# = Indicates failed QC
* = The final LOR has been raised due to dilution or other sample specific cause; adjusted LOR is shown in brackets. The duplicate ranges for Acceptable RPD% are applied to the final LOR where applicable.

Laboratory Duplicate (DUP) Report

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

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 5665368)									
ES2408291-006	1200_MW021_240301	EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 5665503)									
ES2408291-037	1200_SW091_240301	EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	0.01	0.01	0.0	No Limit
		EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
ES2408291-038	1200_MW012D_240312	EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 5673813)									

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 5673813) - continued									
ES2408002-001	Anonymous	EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01 (0.05)*	µg/L	1.01	0.91	10.3	0% - 20%
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01 (0.05)*	µg/L	1.04	0.91	12.9	0% - 20%
		EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02 (0.05)*	µg/L	12.4	11.6	6.5	0% - 20%
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02 (0.05)*	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02 (0.05)*	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02 (0.05)*	µg/L	<0.05	<0.05	0.0	No Limit
ES2408002-002	Anonymous	EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01 (0.05)*	µg/L	0.09	0.10	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01 (0.05)*	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02 (0.05)*	µg/L	7.23	7.31	1.1	0% - 20%
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02 (0.05)*	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02 (0.05)*	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02 (0.05)*	µg/L	<0.05	<0.05	0.0	No Limit
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 5665368)									
ES2408291-006	1200_MW021_240301	EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	<0.1	0.0	No Limit
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 5665503)									
ES2408291-037	1200_SW091_240301	EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	<0.1	0.0	No Limit
ES2408291-038	1200_MW012D_240312	EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 5665503) - continued									
ES2408291-038	1200_MW012D_240312	EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	<0.1	0.0	No Limit
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 5673813)									
ES2408002-001	Anonymous	EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01 (0.05)*	µg/L	3.28	3.04	7.5	0% - 20%
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02 (0.05)*	µg/L	1.87	1.72	8.3	0% - 20%
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02 (0.05)*	µg/L	5.87	5.12	13.5	0% - 20%
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02 (0.05)*	µg/L	0.90	0.86	4.5	0% - 50%
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02 (0.05)*	µg/L	0.12	0.13	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02 (0.05)*	µg/L	0.10	<0.05	67.1	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02 (0.05)*	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02 (0.05)*	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02 (0.05)*	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05 (0.12)*	µg/L	<0.12	<0.12	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1 (0.2)*	µg/L	<0.2	<0.2	0.0	No Limit
ES2408002-002	Anonymous	EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01 (0.05)*	µg/L	0.08	0.10	13.6	No Limit
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02 (0.05)*	µg/L	1.41	1.44	2.3	0% - 20%
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02 (0.05)*	µg/L	2.62	2.66	1.6	0% - 20%
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02 (0.05)*	µg/L	0.23	0.22	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02 (0.05)*	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02 (0.05)*	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02 (0.05)*	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02 (0.05)*	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02 (0.05)*	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05 (0.12)*	µg/L	<0.12	<0.12	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1 (0.2)*	µg/L	<0.2	<0.2	0.0	No Limit
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 5665368)									
ES2408291-006	1200_MW021_240301	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit

Sub-Matrix: **WATER**

Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Laboratory Duplicate (DUP) Report					
				LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 5665368) - continued									
ES2408291-006	1200_MW021_240301	EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 5665503)									
ES2408291-037	1200_SW091_240301	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
ES2408291-038	1200_MW012D_240312	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 5673813)									
ES2408002-001	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02 (0.05)*	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02 (0.05)*	µg/L	<0.05	<0.05	0.0	No Limit

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 5673813) - continued									
ES2408002-001	Anonymous	EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02 (0.05)*	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05 (0.12)*	µg/L	<0.12	<0.12	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05 (0.12)*	µg/L	<0.12	<0.12	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05 (0.12)*	µg/L	<0.12	<0.12	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05 (0.12)*	µg/L	<0.12	<0.12	0.0	No Limit
ES2408002-002	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02 (0.05)*	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02 (0.05)*	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02 (0.05)*	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05 (0.12)*	µg/L	<0.12	<0.12	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05 (0.12)*	µg/L	<0.12	<0.12	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05 (0.12)*	µg/L	<0.12	<0.12	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05 (0.12)*	µg/L	<0.12	<0.12	0.0	No Limit
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 5665368)									
ES2408291-006	1200_MW021_240301	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 5665503)									
ES2408291-037	1200_SW091_240301	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	<0.05	0.0	No Limit

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 5665503) - continued									
ES2408291-038	1200_MW012D_240312	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 5673813)									
ES2408002-001	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	1.24	1.14	8.4	0% - 20%
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	0.08	0.06	38.8	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	<0.05	0.0	No Limit
ES2408002-002	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP231P: PFAS Sums (QC Lot: 5665368)									
ES2408291-006	1200_MW021_240301	EP231X: Sum of PFAS	----	0.01	µg/L	<0.01	<0.01	0.0	No Limit
EP231P: PFAS Sums (QC Lot: 5665503)									
ES2408291-037	1200_SW091_240301	EP231X: Sum of PFAS	----	0.01	µg/L	0.01	0.01	0.0	No Limit
ES2408291-038	1200_MW012D_240312	EP231X: Sum of PFAS	----	0.01	µg/L	<0.01	<0.01	0.0	No Limit
EP231P: PFAS Sums (QC Lot: 5673813)									
ES2408002-001	Anonymous	EP231X: Sum of PFAS	----	0.01 (0.05)*	µg/L	27.9	25.5	9.1	0% - 20%
ES2408002-002	Anonymous	EP231X: Sum of PFAS	----	0.01 (0.05)*	µg/L	11.7	11.8	1.4	0% - 20%

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

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

Sub-Matrix: **WATER**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5665368)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.25 µg/L	75.3	72.0	130
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.25 µg/L	80.7	71.0	127
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	0.25 µg/L	79.8	68.0	131
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.25 µg/L	93.2	69.0	134
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.25 µg/L	79.9	65.0	140
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.25 µg/L	78.1	53.0	142
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5665503)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.25 µg/L	83.2	72.0	130
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.25 µg/L	88.7	71.0	127
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	0.25 µg/L	89.1	68.0	131
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.25 µg/L	92.7	69.0	134
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.25 µg/L	80.1	65.0	140
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.25 µg/L	86.9	53.0	142
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5673813)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.25 µg/L	83.0	72.0	130
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.25 µg/L	90.3	71.0	127
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	0.25 µg/L	76.9	68.0	131
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.25 µg/L	99.9	69.0	134
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.25 µg/L	89.2	65.0	140
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.25 µg/L	92.2	53.0	142
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5665368)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	1.25 µg/L	84.4	73.0	129
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	0.25 µg/L	83.8	72.0	129
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	0.25 µg/L	87.8	72.0	129
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	0.25 µg/L	84.5	72.0	130
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	0.25 µg/L	79.8	71.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	0.25 µg/L	76.8	69.0	130
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	0.25 µg/L	86.6	71.0	129
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	0.25 µg/L	79.5	69.0	133
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	0.25 µg/L	81.2	72.0	134

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
				Result	Concentration	LCS	Low	High
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5665368) - continued								
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	0.25 µg/L	82.4	65.0	144
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	0.625 µg/L	90.2	71.0	132
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5665503)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	1.25 µg/L	82.1	73.0	129
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	0.25 µg/L	90.3	72.0	129
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	0.25 µg/L	84.0	72.0	129
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	0.25 µg/L	85.6	72.0	130
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	0.25 µg/L	87.5	71.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	0.25 µg/L	86.1	69.0	130
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	0.25 µg/L	78.9	71.0	129
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	0.25 µg/L	83.2	69.0	133
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	0.25 µg/L	89.8	72.0	134
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	0.25 µg/L	92.9	65.0	144
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	0.625 µg/L	88.4	71.0	132
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5673813)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	1.25 µg/L	91.4	73.0	129
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	0.25 µg/L	93.4	72.0	129
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	0.25 µg/L	86.3	72.0	129
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	0.25 µg/L	83.1	72.0	130
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	0.25 µg/L	89.0	71.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	0.25 µg/L	92.4	69.0	130
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	0.25 µg/L	87.1	71.0	129
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	0.25 µg/L	91.6	69.0	133
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	0.25 µg/L	96.6	72.0	134
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	0.25 µg/L	98.8	65.0	144
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	0.625 µg/L	92.1	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5665368)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.25 µg/L	80.7	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	0.625 µg/L	81.9	68.0	141
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	0.625 µg/L	99.5	62.6	147
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	0.625 µg/L	105	66.0	145
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	0.625 µg/L	98.6	57.6	145

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Acceptable Limits (%): Low	Acceptable Limits (%): High
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5665368) - continued								
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	0.25 µg/L	83.4	65.0	136
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	0.25 µg/L	83.6	61.0	135
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5665503)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.25 µg/L	87.5	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	0.625 µg/L	76.2	68.0	141
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	0.625 µg/L	81.0	62.6	147
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	0.625 µg/L	92.6	66.0	145
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	0.625 µg/L	86.8	57.6	145
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	0.25 µg/L	84.1	65.0	136
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	0.25 µg/L	76.6	61.0	135
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5673813)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.25 µg/L	80.1	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	0.625 µg/L	99.1	68.0	141
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	0.625 µg/L	97.7	62.6	147
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	0.625 µg/L	94.1	66.0	145
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	0.625 µg/L	84.7	57.6	145
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	0.25 µg/L	85.0	65.0	136
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	0.25 µg/L	86.2	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5665368)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.25 µg/L	89.1	63.0	143
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	0.25 µg/L	74.6	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	0.25 µg/L	78.6	67.0	138
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	0.25 µg/L	98.0	71.4	144
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5665503)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.25 µg/L	96.7	63.0	143
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	0.25 µg/L	79.3	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	0.25 µg/L	81.3	67.0	138

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Acceptable Limits (%): Low	Acceptable Limits (%): High
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5665503) - continued								
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	0.25 µg/L	82.5	71.4	144
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5673813)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.25 µg/L	78.3	63.0	143
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	0.25 µg/L	88.4	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	0.25 µg/L	84.9	67.0	138
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	0.25 µg/L	86.5	71.4	144

Matrix Spike (MS) Report

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

Sub-Matrix: **WATER**

Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report: Spike Concentration	SpikeRecovery(%): MS	Acceptable Limits (%): Low	Acceptable Limits (%): High
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5665368)							
ES2408291-006	1200_MW021_240301	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.25 µg/L	81.2	72.0	130
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.25 µg/L	88.7	71.0	127
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.25 µg/L	83.4	68.0	131
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.25 µg/L	101	69.0	134
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.25 µg/L	87.8	65.0	140
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.25 µg/L	80.5	53.0	142
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5665503)							
ES2408291-037	1200_SW091_240301	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.25 µg/L	77.8	72.0	130
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.25 µg/L	90.2	71.0	127
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.25 µg/L	93.1	68.0	131
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.25 µg/L	91.1	69.0	134
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.25 µg/L	81.3	65.0	140
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.25 µg/L	87.1	53.0	142
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5673813)							
ES2408002-002	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.25 µg/L	85.3	72.0	130
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.25 µg/L	92.4	71.0	127
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.25 µg/L	85.1	68.0	131
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.25 µg/L	104	69.0	134
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.25 µg/L	92.2	65.0	140
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.25 µg/L	85.4	53.0	142
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5665368)							
ES2408291-006	1200_MW021_240301	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	1.25 µg/L	87.7	73.0	129

Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*Concentration*	*MS*	*Low*	*High*
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5665368) - continued							
ES2408291-006	1200_MW021_240301	EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.25 µg/L	87.1	72.0	129
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.25 µg/L	87.7	72.0	129
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.25 µg/L	84.6	72.0	130
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.25 µg/L	81.9	71.0	133
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.25 µg/L	82.5	69.0	130
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.25 µg/L	87.1	71.0	129
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.25 µg/L	84.4	69.0	133
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.25 µg/L	92.0	72.0	134
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.25 µg/L	85.6	65.0	144
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.625 µg/L	96.0	71.0	132
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5665503)							
ES2408291-037	1200_SW091_240301	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	1.25 µg/L	79.1	73.0	129
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.25 µg/L	96.0	72.0	129
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.25 µg/L	83.9	72.0	129
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.25 µg/L	88.6	72.0	130
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.25 µg/L	86.7	71.0	133
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.25 µg/L	87.1	69.0	130
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.25 µg/L	77.7	71.0	129
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.25 µg/L	86.7	69.0	133
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.25 µg/L	93.4	72.0	134
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.25 µg/L	88.7	65.0	144
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.625 µg/L	94.1	71.0	132
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5673813)							
ES2408002-002	Anonymous	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	1.25 µg/L	93.2	73.0	129
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.25 µg/L	95.6	72.0	129
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.25 µg/L	85.4	72.0	129
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.25 µg/L	89.1	72.0	130
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.25 µg/L	90.8	71.0	133
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.25 µg/L	91.0	69.0	130
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.25 µg/L	90.5	71.0	129
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.25 µg/L	105	69.0	133
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.25 µg/L	103	72.0	134
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.25 µg/L	102	65.0	144
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.625 µg/L	103	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5665368)							
ES2408291-006	1200_MW021_240301	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.25 µg/L	80.0	67.0	137
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.625 µg/L	102	68.0	141

Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5665368) - continued							
ES2408291-006	1200_MW021_240301	EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.625 µg/L	76.6	62.6	147
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.625 µg/L	88.9	66.0	145
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.625 µg/L	106	57.6	145
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.25 µg/L	98.8	65.0	136
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.25 µg/L	77.9	61.0	135
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5665503)							
ES2408291-037	1200_SW091_240301	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.25 µg/L	85.5	67.0	137
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.625 µg/L	74.6	68.0	141
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.625 µg/L	90.3	62.6	147
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.625 µg/L	95.6	66.0	145
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.625 µg/L	85.7	57.6	145
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.25 µg/L	75.9	65.0	136
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.25 µg/L	98.4	61.0	135
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5673813)							
ES2408002-002	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.25 µg/L	85.4	67.0	137
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.625 µg/L	98.9	68.0	141
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.625 µg/L	107	62.6	147
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.625 µg/L	95.9	66.0	145
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.625 µg/L	102	57.6	145
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.25 µg/L	94.5	65.0	136
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.25 µg/L	85.6	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5665368)							
ES2408291-006	1200_MW021_240301	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.25 µg/L	74.5	63.0	143
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.25 µg/L	110	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.25 µg/L	109	67.0	138

Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*Concentration*	*MS*	*Low*	*High*
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5665368) - continued							
ES2408291-006	1200_MW021_240301	EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.25 µg/L	73.9	71.4	144
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5665503)							
ES2408291-037	1200_SW091_240301	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.25 µg/L	120	63.0	143
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.25 µg/L	80.1	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.25 µg/L	109	67.0	138
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.25 µg/L	106	71.4	144
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5673813)							
ES2408002-002	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.25 µg/L	73.1	63.0	143
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.25 µg/L	94.1	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.25 µg/L	77.9	67.0	138
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.25 µg/L	73.7	71.4	144

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **ES2408291**	Page	: 1 of 8
Amendment	: **1**		
Client	: [redacted]	Laboratory	: Environmental Division Sydney
Contact	: [redacted]	Telephone	: [redacted]
Project	: NT_1200_PFASOMP_24	Date Samples Received	: 14-Mar-2024
Site	: Robertson Barracks	Issue Date	: 22-Mar-2024
Sampler	: [redacted]	No. of samples received	: 36
Order number	: 60612561/2.2	No. of samples analysed	: 36

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

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

Summary of Outliers

Outliers : Quality Control Samples

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

- **NO Method Blank value outliers occur.**
- **NO Duplicate outliers occur.**
- **NO Laboratory Control outliers occur.**
- **NO Matrix Spike outliers occur.**
- **For all regular sample matrices, NO surrogate recovery outliers occur.**

Outliers : Analysis Holding Time Compliance

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

Outliers : Frequency of Quality Control Samples

- **NO Quality Control Sample Frequency Outliers exist.**

Analysis Holding Time Compliance

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

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

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

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

Matrix: **WATER**

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

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP231A: Perfluoroalkyl Sulfonic Acids							
HDPE (no PTFE) (EP231X) 1200_QC400_240301, 1200_QC500_240301, 1200_SW123_240301, 1200_SW086_240301, 1200_SW091_240301	**01-Mar-2024**	**18-Mar-2024**	28-Aug-2024	✓	**19-Mar-2024**	28-Aug-2024	✓
HDPE (no PTFE) (EP231X) 1200_MW018_240301, 1200_MW021_240301, 1200_MW021D_240301, 1200_MW023_240301, 1200_QC300_240301	**01-Mar-2024**	**18-Mar-2024**	28-Aug-2024	✓	**20-Mar-2024**	28-Aug-2024	✓
HDPE (no PTFE) (EP231X) 1200_QC301_240305, 1200_QC401_240305, 1200_SW023_240305, 1200_SW028_240305	**05-Mar-2024**	**18-Mar-2024**	01-Sep-2024	✓	**19-Mar-2024**	01-Sep-2024	✓
HDPE (no PTFE) (EP231X) 1200_MW004_240305, 1200_MW004D_240305, 1200_MW080_240305, 1200_MW112_240305, 1200_MW113_240305, 1200_QC100_240305	**05-Mar-2024**	**18-Mar-2024**	01-Sep-2024	✓	**20-Mar-2024**	01-Sep-2024	✓
HDPE (no PTFE) (EP231X) 1200_SW007_240306	**06-Mar-2024**	**18-Mar-2024**	02-Sep-2024	✓	**19-Mar-2024**	02-Sep-2024	✓
HDPE (no PTFE) (EP231X) 1200_QC302_240306, 1200_QC402_240306	**06-Mar-2024**	**20-Mar-2024**	02-Sep-2024	✓	**21-Mar-2024**	02-Sep-2024	✓
HDPE (no PTFE) (EP231X) 1200_SW059_240307	**07-Mar-2024**	**18-Mar-2024**	03-Sep-2024	✓	**19-Mar-2024**	03-Sep-2024	✓
HDPE (no PTFE) (EP231X) 1200_QC303_240307, 1200_QC403_240307	**07-Mar-2024**	**20-Mar-2024**	03-Sep-2024	✓	**21-Mar-2024**	03-Sep-2024	✓
HDPE (no PTFE) (EP231X) 1200_MW029_240308, 1200_MW030_240308, 1200_MW031_240308	**08-Mar-2024**	**18-Mar-2024**	04-Sep-2024	✓	**20-Mar-2024**	04-Sep-2024	✓
HDPE (no PTFE) (EP231X) 1200_MW001_240306, 1200_MW032_240307	**11-Mar-2024**	**18-Mar-2024**	07-Sep-2024	✓	**20-Mar-2024**	07-Sep-2024	✓
HDPE (no PTFE) (EP231X) 1200_QC101_240312, 1200_MW012D_240312	**12-Mar-2024**	**18-Mar-2024**	08-Sep-2024	✓	**19-Mar-2024**	08-Sep-2024	✓
HDPE (no PTFE) (EP231X) 1200_MW012_240312, 1200_MW034_240312, 1200_MW066_240307	**12-Mar-2024**	**18-Mar-2024**	08-Sep-2024	✓	**20-Mar-2024**	08-Sep-2024	✓

Matrix: **WATER**

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

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP231B: Perfluoroalkyl Carboxylic Acids							
HDPE (no PTFE) (EP231X) 1200_QC400_240301, 1200_SW123_240301, 1200_SW091_240301, 1200_QC500_240301, 1200_SW086_240301,	**01-Mar-2024**	**18-Mar-2024**	28-Aug-2024	✓	**19-Mar-2024**	28-Aug-2024	✓
HDPE (no PTFE) (EP231X) 1200_MW018_240301, 1200_MW021D_240301, 1200_QC300_240301, 1200_MW021_240301, 1200_MW023_240301,	**01-Mar-2024**	**18-Mar-2024**	28-Aug-2024	✓	**20-Mar-2024**	28-Aug-2024	✓
HDPE (no PTFE) (EP231X) 1200_QC301_240305, 1200_SW023_240305, 1200_QC401_240305, 1200_SW028_240305	**05-Mar-2024**	**18-Mar-2024**	01-Sep-2024	✓	**19-Mar-2024**	01-Sep-2024	✓
HDPE (no PTFE) (EP231X) 1200_MW004_240305, 1200_MW080_240305, 1200_MW113_240305, 1200_MW004D_240305, 1200_MW112_240305, 1200_QC100_240305	**05-Mar-2024**	**18-Mar-2024**	01-Sep-2024	✓	**20-Mar-2024**	01-Sep-2024	✓
HDPE (no PTFE) (EP231X) 1200_SW007_240306	**06-Mar-2024**	**18-Mar-2024**	02-Sep-2024	✓	**19-Mar-2024**	02-Sep-2024	✓
HDPE (no PTFE) (EP231X) 1200_QC302_240306, 1200_QC402_240306	**06-Mar-2024**	**20-Mar-2024**	02-Sep-2024	✓	**21-Mar-2024**	02-Sep-2024	✓
HDPE (no PTFE) (EP231X) 1200_SW059_240307	**07-Mar-2024**	**18-Mar-2024**	03-Sep-2024	✓	**19-Mar-2024**	03-Sep-2024	✓
HDPE (no PTFE) (EP231X) 1200_QC303_240307, 1200_QC403_240307	**07-Mar-2024**	**20-Mar-2024**	03-Sep-2024	✓	**21-Mar-2024**	03-Sep-2024	✓
HDPE (no PTFE) (EP231X) 1200_MW029_240308, 1200_MW031_240308, 1200_MW030_240308,	**08-Mar-2024**	**18-Mar-2024**	04-Sep-2024	✓	**20-Mar-2024**	04-Sep-2024	✓
HDPE (no PTFE) (EP231X) 1200_MW001_240306, 1200_MW032_240307	**11-Mar-2024**	**18-Mar-2024**	07-Sep-2024	✓	**20-Mar-2024**	07-Sep-2024	✓
HDPE (no PTFE) (EP231X) 1200_QC101_240312, 1200_MW012D_240312	**12-Mar-2024**	**18-Mar-2024**	08-Sep-2024	✓	**19-Mar-2024**	08-Sep-2024	✓
HDPE (no PTFE) (EP231X) 1200_MW012_240312, 1200_MW066_240307, 1200_MW034_240312,	**12-Mar-2024**	**18-Mar-2024**	08-Sep-2024	✓	**20-Mar-2024**	08-Sep-2024	✓

Matrix: **WATER**

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

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP231C: Perfluoroalkyl Sulfonamides							
HDPE (no PTFE) (EP231X) 1200_QC400_240301, 1200_QC500_240301, 1200_SW123_240301, 1200_SW086_240301, 1200_SW091_240301	**01-Mar-2024**	**18-Mar-2024**	28-Aug-2024	✓	**19-Mar-2024**	28-Aug-2024	✓
HDPE (no PTFE) (EP231X) 1200_MW018_240301, 1200_MW021_240301, 1200_MW021D_240301, 1200_MW023_240301, 1200_QC300_240301	**01-Mar-2024**	**18-Mar-2024**	28-Aug-2024	✓	**20-Mar-2024**	28-Aug-2024	✓
HDPE (no PTFE) (EP231X) 1200_QC301_240305, 1200_QC401_240305, 1200_SW023_240305, 1200_SW028_240305	**05-Mar-2024**	**18-Mar-2024**	01-Sep-2024	✓	**19-Mar-2024**	01-Sep-2024	✓
HDPE (no PTFE) (EP231X) 1200_MW004_240305, 1200_MW004D_240305, 1200_MW080_240305, 1200_MW112_240305, 1200_MW113_240305, 1200_QC100_240305	**05-Mar-2024**	**18-Mar-2024**	01-Sep-2024	✓	**20-Mar-2024**	01-Sep-2024	✓
HDPE (no PTFE) (EP231X) 1200_SW007_240306	**06-Mar-2024**	**18-Mar-2024**	02-Sep-2024	✓	**19-Mar-2024**	02-Sep-2024	✓
HDPE (no PTFE) (EP231X) 1200_QC302_240306, 1200_QC402_240306	**06-Mar-2024**	**20-Mar-2024**	02-Sep-2024	✓	**21-Mar-2024**	02-Sep-2024	✓
HDPE (no PTFE) (EP231X) 1200_SW059_240307	**07-Mar-2024**	**18-Mar-2024**	03-Sep-2024	✓	**19-Mar-2024**	03-Sep-2024	✓
HDPE (no PTFE) (EP231X) 1200_QC303_240307, 1200_QC403_240307	**07-Mar-2024**	**20-Mar-2024**	03-Sep-2024	✓	**21-Mar-2024**	03-Sep-2024	✓
HDPE (no PTFE) (EP231X) 1200_MW029_240308, 1200_MW030_240308, 1200_MW031_240308	**08-Mar-2024**	**18-Mar-2024**	04-Sep-2024	✓	**20-Mar-2024**	04-Sep-2024	✓
HDPE (no PTFE) (EP231X) 1200_MW001_240306, 1200_MW032_240307	**11-Mar-2024**	**18-Mar-2024**	07-Sep-2024	✓	**20-Mar-2024**	07-Sep-2024	✓
HDPE (no PTFE) (EP231X) 1200_QC101_240312, 1200_MW012D_240312	**12-Mar-2024**	**18-Mar-2024**	08-Sep-2024	✓	**19-Mar-2024**	08-Sep-2024	✓
HDPE (no PTFE) (EP231X) 1200_MW012_240312, 1200_MW034_240312, 1200_MW066_240307	**12-Mar-2024**	**18-Mar-2024**	08-Sep-2024	✓	**20-Mar-2024**	08-Sep-2024	✓

Matrix: **WATER**

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

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP231D: (n:2) Fluorotelomer Sulfonic Acids							
HDPE (no PTFE) (EP231X) 1200_QC400_240301, 1200_QC500_240301, 1200_SW123_240301, 1200_SW086_240301, 1200_SW091_240301	**01-Mar-2024**	**18-Mar-2024**	28-Aug-2024	✓	**19-Mar-2024**	28-Aug-2024	✓
HDPE (no PTFE) (EP231X) 1200_MW018_240301, 1200_MW021_240301, 1200_MW021D_240301, 1200_MW023_240301, 1200_QC300_240301	**01-Mar-2024**	**18-Mar-2024**	28-Aug-2024	✓	**20-Mar-2024**	28-Aug-2024	✓
HDPE (no PTFE) (EP231X) 1200_QC301_240305, 1200_QC401_240305, 1200_SW023_240305, 1200_SW028_240305	**05-Mar-2024**	**18-Mar-2024**	01-Sep-2024	✓	**19-Mar-2024**	01-Sep-2024	✓
HDPE (no PTFE) (EP231X) 1200_MW004_240305, 1200_MW004D_240305, 1200_MW080_240305, 1200_MW112_240305, 1200_MW113_240305, 1200_QC100_240305	**05-Mar-2024**	**18-Mar-2024**	01-Sep-2024	✓	**20-Mar-2024**	01-Sep-2024	✓
HDPE (no PTFE) (EP231X) 1200_SW007_240306	**06-Mar-2024**	**18-Mar-2024**	02-Sep-2024	✓	**19-Mar-2024**	02-Sep-2024	✓
HDPE (no PTFE) (EP231X) 1200_QC302_240306, 1200_QC402_240306	**06-Mar-2024**	**20-Mar-2024**	02-Sep-2024	✓	**21-Mar-2024**	02-Sep-2024	✓
HDPE (no PTFE) (EP231X) 1200_SW059_240307	**07-Mar-2024**	**18-Mar-2024**	03-Sep-2024	✓	**19-Mar-2024**	03-Sep-2024	✓
HDPE (no PTFE) (EP231X) 1200_QC303_240307, 1200_QC403_240307	**07-Mar-2024**	**20-Mar-2024**	03-Sep-2024	✓	**21-Mar-2024**	03-Sep-2024	✓
HDPE (no PTFE) (EP231X) 1200_MW029_240308, 1200_MW030_240308, 1200_MW031_240308	**08-Mar-2024**	**18-Mar-2024**	04-Sep-2024	✓	**20-Mar-2024**	04-Sep-2024	✓
HDPE (no PTFE) (EP231X) 1200_MW001_240306, 1200_MW032_240307	**11-Mar-2024**	**18-Mar-2024**	07-Sep-2024	✓	**20-Mar-2024**	07-Sep-2024	✓
HDPE (no PTFE) (EP231X) 1200_QC101_240312, 1200_MW012D_240312	**12-Mar-2024**	**18-Mar-2024**	08-Sep-2024	✓	**19-Mar-2024**	08-Sep-2024	✓
HDPE (no PTFE) (EP231X) 1200_MW012_240312, 1200_MW034_240312, 1200_MW066_240307	**12-Mar-2024**	**18-Mar-2024**	08-Sep-2024	✓	**20-Mar-2024**	08-Sep-2024	✓

Matrix: **WATER**

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

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP231P: PFAS Sums							
HDPE (no PTFE) (EP231X) 1200_QC400_240301, 1200_QC500_240301, 1200_SW123_240301, 1200_SW086_240301, 1200_SW091_240301	**01-Mar-2024**	**18-Mar-2024**	28-Aug-2024	✓	**19-Mar-2024**	28-Aug-2024	✓
HDPE (no PTFE) (EP231X) 1200_MW018_240301, 1200_MW021_240301, 1200_MW021D_240301, 1200_MW023_240301, 1200_QC300_240301	**01-Mar-2024**	**18-Mar-2024**	28-Aug-2024	✓	**20-Mar-2024**	28-Aug-2024	✓
HDPE (no PTFE) (EP231X) 1200_QC301_240305, 1200_QC401_240305, 1200_SW023_240305, 1200_SW028_240305	**05-Mar-2024**	**18-Mar-2024**	01-Sep-2024	✓	**19-Mar-2024**	01-Sep-2024	✓
HDPE (no PTFE) (EP231X) 1200_MW004_240305, 1200_MW004D_240305, 1200_MW080_240305, 1200_MW112_240305, 1200_MW113_240305, 1200_QC100_240305	**05-Mar-2024**	**18-Mar-2024**	01-Sep-2024	✓	**20-Mar-2024**	01-Sep-2024	✓
HDPE (no PTFE) (EP231X) 1200_SW007_240306	**06-Mar-2024**	**18-Mar-2024**	02-Sep-2024	✓	**19-Mar-2024**	02-Sep-2024	✓
HDPE (no PTFE) (EP231X) 1200_QC302_240306, 1200_QC402_240306	**06-Mar-2024**	**20-Mar-2024**	02-Sep-2024	✓	**21-Mar-2024**	02-Sep-2024	✓
HDPE (no PTFE) (EP231X) 1200_SW059_240307	**07-Mar-2024**	**18-Mar-2024**	03-Sep-2024	✓	**19-Mar-2024**	03-Sep-2024	✓
HDPE (no PTFE) (EP231X) 1200_QC303_240307, 1200_QC403_240307	**07-Mar-2024**	**20-Mar-2024**	03-Sep-2024	✓	**21-Mar-2024**	03-Sep-2024	✓
HDPE (no PTFE) (EP231X) 1200_MW029_240308, 1200_MW030_240308, 1200_MW031_240308	**08-Mar-2024**	**18-Mar-2024**	04-Sep-2024	✓	**20-Mar-2024**	04-Sep-2024	✓
HDPE (no PTFE) (EP231X) 1200_MW001_240306, 1200_MW032_240307	**11-Mar-2024**	**18-Mar-2024**	07-Sep-2024	✓	**20-Mar-2024**	07-Sep-2024	✓
HDPE (no PTFE) (EP231X) 1200_QC101_240312, 1200_MW012D_240312	**12-Mar-2024**	**18-Mar-2024**	08-Sep-2024	✓	**19-Mar-2024**	08-Sep-2024	✓
HDPE (no PTFE) (EP231X) 1200_MW012_240312, 1200_MW034_240312, 1200_MW066_240307	**12-Mar-2024**	**18-Mar-2024**	08-Sep-2024	✓	**20-Mar-2024**	08-Sep-2024	✓

Quality Control Parameter Frequency Compliance

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

Matrix: **WATER**

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

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	5	47	**10.64**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	3	47	**6.38**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	3	47	**6.38**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	3	47	**6.38**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard

Brief Method Summaries

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

Analytical Methods	Method	Matrix	Method Descriptions
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	WATER	In-house: Analysis of fresh and saline waters by Solid Phase Extraction (SPE) followed by LC-Electrospray-MS-MS, Negative Mode using MRM and internal standard quantitation. Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to the sample container. The entire contents are transferred to a solid phase extraction (SPE) cartridge. The sample container is successively rinsed with aliquots of the elution solvent. The eluted extract is combined with an equal volume of reagent water and a portion is filtered for analysis. Method procedures and data quality objectives conform to US DoD QSM 5.4, table B-15 requirements.

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

Australian Government
Department of Industry, Science and Resources

National Measurement Institute

SAMPLE RECEIPT NOTIFICATION

CUSTOMER DETAILS

Attention: [redacted]

Customer:

Address:

Email:

Telephone:

LABORATORY DETAILS

Lab: National Measurement Institute

Contact: Client Services

Address: [redacted]

Email:

Telephone:

SAMPLE DETAILS

NMI Job Name: AECO06/240315

Total No. of Samples: 2

LRNs	Estimated Report Date	Customer Sample ID	Lab Sample Description
N24/005696	22-MAR-2024	1200_QC200_240305	WATER 05/03/2024 03:39PM
N24/005697	22-MAR-2024	1200_QC201_240312	WATER 12/03/2024 09:55AM

SAMPLE RECEIVED CONDITION

Date samples received:	15-MAR-2024
Sample received in good order:	Yes
NMI Quotation no. provided:	NT_1200_PFASOMP_24
Client purchase order number:	60612561/2_2
Temperature of samples:	Chilled
Comments:	
Mode of Delivery:	

Additional Terms and Conditions

Incomplete / unclear information about samples or required testing will delay the start of the analysis work.

If you require your Purchase Order (PO) number to be included on our invoice, please provide the number during sample submission and before the completion of work to avoid unnecessary delays and/or additional processing/handling fees.

Alterations to Client requirements requested after commencement of testing may incur charges.

The lodgement of an order or receipt of samples for NMI services referenced in this Sample Receipt Notification constitutes an acceptence of the current version of NMI Terms and Conditions or other applicable Terms referenced in the NMI Quotation. NMI Terms and Conditions are available on the web at https://www.industry.gov.au/client-services/testing-and-analysis-services/chemical-and-biological-analysis-services-terms-and-conditions

REPORT OF ANALYSIS

Report No. RN1422787

Client	[redacted]	**Job No.**	: AECO06/240315
		Quote No.	: QT-02257
		Order No.	: 60612561/2_2
		Date Received	: 15-MAR-2024
Attention		**Sampled By**	: CLIENT
Project Name : NT_1200_PFASOMP_24			
Your Client Services Manager : [redacted]		**Phone**	: [redacted]

Lab Reg No.	Sample Ref	Sample Description
N24/005696	1200_QC200_240305	WATER 05/03/2024 03:39PM
N24/005697	1200_QC201_240312	WATER 12/03/2024 09:55AM

Lab Reg No.		N24/005696	N24/005697			
Date Sampled		05-MAR-2024	12-MAR-2024			
	Units					Method
PFAS (per-and poly-fluoroalkyl substances)						
PFBA (375-22-4)	ug/L	<0.05	<0.05			NR70
PFPeA (2706-90-3)	ug/L	<0.02	<0.02			NR70
PFHxA (307-24-4)	ug/L	<0.01	0.026			NR70
PFHpA (375-85-9)	ug/L	<0.01	<0.01			NR70
PFOA (335-67-1)	ug/L	<0.01	<0.01			NR70
PFNA (375-95-1)	ug/L	<0.01	<0.01			NR70
PFDA (335-76-2)	ug/L	<0.01	<0.01			NR70
PFUdA (2058-94-8)	ug/L	<0.01	<0.01			NR70
PFDoA (307-55-1)	ug/L	<0.01	<0.01			NR70
PFTrDA (72629-94-8)	ug/L	<0.02	<0.02			NR70
PFTeDA (376-06-7)	ug/L	<0.02	<0.02			NR70
PFHxDA (67905-19-5)	ug/L	<0.02	<0.02			NR70
PFODA (16517-11-6)	ug/L	<0.05	<0.05			NR70
FOUEA (70887-84-2)	ug/L	<0.01	<0.01			NR70
PFDS (335-77-3)	ug/L	<0.01	<0.01			NR70
PFPeS (2706-91-4)	ug/L	<0.01	<0.01			NR70
PFHxS (355-46-4)	ug/L	<0.01	0.017			NR70
PFHpS (375-92-8)	ug/L	<0.01	<0.01			NR70
PFOS (1763-23-1)	ug/L	<0.02	0.072			NR70
PFNS (68259-12-1)	ug/L	<0.01	<0.01			NR70
PFBS (375-73-5)	ug/L	<0.01	<0.01			NR70
PFOSA (754-91-6)	ug/L	<0.01	<0.01			NR70
N-MeFOSA (31506-32-8)	ug/L	<0.02	<0.02			NR70
N-EtFOSA (4151-50-2)	ug/L	<0.02	<0.02			NR70
N-MeFOSAA (2355-31-9)	ug/L	<0.01	<0.01			NR70
N-EtFOSAA(2991-50-6)	ug/L	<0.01	<0.01			NR70
N-MeFOSE (24448-09-7)	ug/L	<0.05	<0.05			NR70
N-EtFOSE (1691-99-2)	ug/L	<0.05	<0.05			NR70
4:2 FTS (757124-72-4)	ug/L	<0.01	<0.01			NR70

REPORT OF ANALYSIS

Lab Reg No.		N24/005696	N24/005697			
Date Sampled		05-MAR-2024	12-MAR-2024			
	Units					Method
PFAS (per-and poly-fluoroalkyl substances)						
6:2 FTS (27619-97-2)	ug/L	<0.01	<0.01			NR70
8:2 FTS (39108-34-4)	ug/L	<0.01	<0.01			NR70
10:2 FTS (120226-60-0)	ug/L	<0.01	<0.01			NR70
8:2 diPAP (678-41-1)	ug/L	<0.02	<0.02			NR70
PFBA (Surrogate Recovery)	%	123	128			NR70
PFPeA (Surrogate Recovery)	%	115	124			NR70
PFHxA (Surrogate Recovery)	%	121	123			NR70
PFHpA (Surrogate Recovery)	%	115	120			NR70
PFOA (Surrogate Recovery)	%	113	125			NR70
PFNA (Surrogate Recovery)	%	94	114			NR70
PFDA (Surrogate Recovery)	%	77	83			NR70
PFUdA (Surrogate Recovery)	%	62	75			NR70
PFDoA (Surrogate Recovery)	%	56	69			NR70
PFTeDA (Surrogate Recovery)	%	71	72			NR70
PFHxDA (Surrogate Recovery)	%	99	73			NR70
FOUEA (Surrogate Recovery)	%	68	74			NR70
PFBS (Surrogate Recovery)	%	122	130			NR70
PFHxS (Surrogate Recovery)	%	122	126			NR70
PFOS (Surrogate Recovery)	%	94	99			NR70
PFOSA (Surrogate Recovery)	%	69	99			NR70
N-MeFOSA (Surrogate Recovery)	%	59	78			NR70
N-EtFOSA (Surrogate Recovery)	%	51	69			NR70
N-MeFOSAA (Surrogate Recovery)	%	56	78			NR70
N-EtFOSAA (Surrogate Recovery)	%	49	82			NR70
N-MeFOSE (Surrogate Recovery)	%	41	53			NR70
N-EtFOSE (Surrogate Recovery)	%	49	62			NR70
4:2 FTS (Surrogate Recovery)	%	220	170			NR70
6:2 FTS (Surrogate Recovery)	%	126	218			NR70
8:2 FTS (Surrogate Recovery)	%	69	76			NR70
8:2 diPAP (Surrogate Recovery)	%	99	88			NR70
Dates						
Date extracted		20-MAR-2024	20-MAR-2024			
Date analysed		20-MAR-2024	20-MAR-2024			

N24/005696
to
N24/005697

PFOS and PFHxS are quantified using a combined branched and linear standard,

linear and branched isomers are totalled for reporting.
All results corrected for labelled surrogate recoveries.

Selected PFAS surrogate recoveries are biased due to matrix effects.ô
High PFAS surrogate recoveries accepted - results corrected for recovery.
Surrogate recoveries low for selected analytes - PFAS LORs not raised since S/N >10.

[redacted]

NATA
WORLD RECOGNISED
ACCREDITATION

Accredited for compliance with ISO/IEC 17025 - Testing.
This report shall not be reproduced except in full.
Results relate only to the sample(s) as received and tested.

Measurement Uncertainty is available upon request.

Note: Sampling date(s) have been provided by the client.
The testing was undertaken at: 105 Delhi Road, North Ryde, NSW, 2113

Australian Government

National Measurement Institute

QUALITY ASSURANCE REPORT

Client: AECOM AUSTRALIA PTY LTD

NMI QA Report No: AECO06/240315 **Sample Matrix:** Liquid

Analyte	Method	LOR	Blank	Sample Duplicates			Recoveries	
				Sample	Duplicate	RPD	LCS	Matrix Spike
		ug/L	ug/L	ug/L	ug/L	%	%	%
PFBA (375-22-4)	NR70	0.05	<0.05	NA	NA	NA	84	NA
PFPeA (2706-90-3)	NR70	0.02	<0.02	NA	NA	NA	74	NA
PFHxA (307-24-4)	NR70	0.01	<0.01	NA	NA	NA	80	NA
PFHpA (375-85-9)	NR70	0.01	<0.01	NA	NA	NA	75	NA
PFOA (335-67-1)	NR70	0.01	<0.01	NA	NA	NA	79	NA
PFNA (375-95-1)	NR70	0.01	<0.01	NA	NA	NA	78	NA
PFDA (335-76-2)	NR70	0.01	<0.01	NA	NA	NA	82	NA
PFUdA (2058-94-8)	NR70	0.01	<0.01	NA	NA	NA	75	NA
PFDoA (307-55-1)	NR70	0.01	<0.01	NA	NA	NA	70	NA
PFTrDA (72629-94-8)	NR70	0.02	<0.02	NA	NA	NA	66	NA
PFTeDA (376-06-7)	NR70	0.02	<0.02	NA	NA	NA	90	NA
PFHxDA (67905-19-5)	NR70	0.02	<0.02	NA	NA	NA	80	NA
PFODA (16517-11-6)	NR70	0.05	<0.05	NA	NA	NA	92	NA
FOUEA (70887-84-2)	NR70	0.01	<0.01	NA	NA	NA	90	NA
PFBS (375-73-5)	NR70	0.01	<0.01	NA	NA	NA	78	NA
PFPeS (2706-91-4)	NR70	0.01	<0.01	NA	NA	NA	78	NA
PFHxS (355-46-4)	NR70	0.01	<0.01	NA	NA	NA	78	NA
PFHpS (375-92-8)	NR70	0.01	<0.01	NA	NA	NA	74	NA
PFOS (1763-23-1)	NR70	0.02	<0.02	NA	NA	NA	80	NA
PFNS (68259-12-1)	NR70	0.01	<0.01	NA	NA	NA	79	NA
PFDS (335-77-3)	NR70	0.01	<0.01	NA	NA	NA	64	NA
PFOSA (754-91-6)	NR70	0.01	<0.01	NA	NA	NA	79	NA
N-MeFOSA (31506-32-8)	NR70	0.02	<0.02	NA	NA	NA	72	NA
N-EtFOSA (4151-50-2)	NR70	0.02	<0.02	NA	NA	NA	89	NA
N-MeFOSAA (2355-31-9)	NR70	0.01	<0.01	NA	NA	NA	83	NA
N-EtFOSAA(2991-50-6)	NR70	0.01	<0.01	NA	NA	NA	75	NA
N-MeFOSE (24448-09-7)	NR70	0.05	<0.05	NA	NA	NA	128	NA
N-EtFOSE (1691-99-2)	NR70	0.05	<0.05	NA	NA	NA	88	NA
4:2 FTS (757124-72-4)	NR70	0.01	<0.01	NA	NA	NA	75	NA
6:2 FTS (27619-97-2)	NR70	0.01	<0.01	NA	NA	NA	80	NA
8:2 FTS (39108-34-4)	NR70	0.01	<0.01	NA	NA	NA	86	NA
10:2 FTS (120226-60-0)	NR70	0.01	<0.01	NA	NA	NA	67	NA
8:2 diPAP (678-41-1)	NR70	0.02	<0.02	NA	NA	NA	99	NA

Results expressed in percentage (%) or ug/L wherever appropriate.
Acceptable Spike recovery is 50-150%.
Maximum acceptable RPDs on spikes and duplicates is 40%.
'NA ' = Not Applicable.
RPD= Relative Percentage Difference.

Signed:

Date:

Appendix G

Sampling Logs

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FQM - Daily Activity Report

Q4AN(EV)-002-FM1

Project Name:	PFASOMP/WQMP	**Project Number:**	60612561/60719185
Project Location:	Robertson Barracks/CTA	**Client:**	Department of Defence/Ventia
Date of Fieldwork:	28/11/23	**PM Name:**	[redacted]
Time Arrive:	7:45	**Time Depart:**	12:40

Administration

Personnel On-Site:	[redacted]
Contractors (Inducted, Downtime):	

Tasks Undertaken

Describe tasks and time of activities undertaken, observations, communications with PM, clients and subcontractors etc.

☐ Cross out unused portions of the site notes ☐ Indicate QAQC samples collected & note on tracking sheet

☐ Record number waste drums transported on & off-site ☐ Indicate observations of on-Site environmental receptors

Indicate Weather Conditions:

7:15 - Mobilise to site
7:45 - arrive at robbo
↳ inspect SW locations on base for water
↳ no water for all sites
→ sample, gauge & reinstall MW004D 8:29
8:45 - arrive & sign in at Range control
- mobilise to CTA
↳ sample MW086 9:31
- stagnant, large pool
↳ QC101, QC201
10:00 - arrive & sample SW123
↳ Moderate flow
10:30 - arrive & sample SW091
↳ moderate flow
11:15 - sign out of Range Control
11:50 - lunch
→ 12:20 - Arrive at lab, COC organisation
12:45 - drop off samples to ALS
mobilise back to office

HSE Actions

Describe any HSE actions or oberservations or additional information that is not recorded in the HSEP

- Very steep & rocky for SW091 & SW123
- Truck driving training in CTA

Approval

[redacted]
Fieldwork Staff Signature

28/11/23
Date

Distribution: Project Central File

ANZ

FQM - Groundwater Sampling and Purging Record

AECOM

Q4AN(EV)-405-FM1

Project Name:	PFASOMP/ WQMP	Project Number:	60612561/60719185	PM Name:	[redacted]	Sample Date:	28/11/23
Client:	Defence / Ventia	Project Location:	Robbo - CTA	Fieldwork Staff:		Well Development or Well Sampling Event? (circle)	

General Bore Information		Parameter Info.	Decontamination	Sampling Method	Hydrasleeve info.	
Date of GW Level:	Bore Radius (mm):	Chem Kit Serial No.:	☐ Decontaminated	☐ Low Flow Pump rate:	Hydrasleeve Size: 1L	Monitoring sequence followed (number in order):
Depth to GW (m-pvc):	Screen Interval (m):	Chem Kit Model:	☐ Dedicated	Intake depth:	Hydrasleeve Type:	
Bore Depth (m-pvc):	Casing Radius (mm):	Corrected Redox: Y / N	☐ Disposable	☐ Bailer ☒ Hydrasleeve	Sampling Depth (m-pvc):	1 Gauging
Depth to Product (m-pvc):	Cover Type (gatic/stick up):	(The correction to apply is probe dependent)	☐ Other (specify)	☐ Peristaltic Pump ☐ Waterra	Hydrasleeve Install time:	2 Hydrasleeve in
Product Thickness (m):	Bore Locked (YES/NO):	Parameter method: ☐ Downhole		☐ Other (specify)	Sampling Start Time: 8:24	3 Hydrasleeve out
	Key Type (if applicable):	☐ Retrieved				4 Parameters
Calculated bore volume (L):	Includes/ excludes bore annulus (circle)	# purge volumes removed:		Total purged volume (L):		

Water Quality Parameters

Location ID	Time	Turbidity (NTU)	QAQC?	DO (ppm or mg/L)	E.C. (mS/cm or µS/cm)	pH	Redox (mV)	Temp °C	Odour, Colour, Turbidity
MW004D	8:29	4.835	100/200	3.65	332.5	6.58	-141.5	30.4	Colourless, low TB, NO, NS
SW086	9:31	1.1	101/201	1.48	47.6	5.04	115.0	29.8	very pale brown, low TB, NO NS, no flow
SW123	10:00	1.0		2.24	55.5	6.05	94.8	28.8	colourless, low TB, NO, NS, mod flow
SW097	10:35	1.0		1.79	36.1	5.21	96.2	29.1	colourless, low TB, , NO, NS, mod flow
Acceptable Parameter Range:				± 10%	± 3%	± 0.05	± 10 mV	± 0.2 °C	± 10% turbidity (if using a turbidity meter)

Analytes Sampled for:		Bottles Collected				QA/QC Information	Field Commets
Field Filtered:	Unfiltered:	x 40 mL Vial (HCl)		x 60 mL Ferrous	✓ x 60 mL metals (HNO_3)	100, 200 amp & wamp 101, 201	Bore volume calculation, bore condition, fate of tubing, redox correction etc.
✓		x 40 mL Vial (H_2SO_4)		x 100 mL Amber	✓ x 250 mL Plastic		TB = turbidity
					✓ x60mL chromium		NO = no odour
							NS = no sheen

Approval and Distribution

[redacted]
Fieldwork Staff Signature — Date: 28/11/23

Checker Name and Signature — Date

Project Manager Signature — Date

Distribution: Project Central File

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ANZ

FQM - Sample QAQC Tracking Sheet

Q4AN(EV)-011-FM1

Project Name:	PFASOMP	Project Number:	60612561
Project Location:	Robbo - CTA	Client:	Defence
PM Name:	[redacted]		

QAQC Information

QAQC ID	Primary Sample ID	Sample Type	Batch Number
QC100	MW0040	Dup	28/11/23
QC200	MW0040	Trip	
QC300	Sampling Pole	Rinsate	
QC400		field blank	
QC500		trip blank	

QA\QC Project Requirements

QAQC	Required		Frequency		Method Used
Field Duplicates	☑ Yes	☐ No	☑ 1 in 10	☐ 1 in 20	
Field Triplicates	☑ Yes	☐ No	☐ 1 in 10	☐ 1 in 20	
Rinsate Blanks	☑ Yes	☐ No	☑ 1 per matrix/equipment/day		
Field Blanks	☑ Yes	☐ No	☑ 1 per day		
Trip Blanks	☑ Yes	☐ No	☑ 1 per ice chest		
Trip Spikes	☐ Yes	☑ No	☐ 1 per ice chest		

Approval and Dist[redacted]

[redacted]re

28/11/23
Date

Project Manager Signature

Date

Distribution: Project Central File

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FQM - Sample QAQC Tracking Sheet

Q4AN(EV)-011-FM1

Project Name:	PFASOMP	Project Number:	60612561
Project Location:	Robbo	Client:	Ventia
PM Name:	[redacted]		

QAQC Information

QAQC ID	Primary Sample ID	Sample Type	Date
QC100	SW054	Dup	11/12/23
QC200	SW054	Trip	11/12/23
QC100	SW007	Dup	15/12/23
QC200	SW007	Trip	15/12/23
QC300	Pole	Rinsate	11/12/23
QC400	–	field blank	11/12/23
QC300	Glove	Rinsate	15/12/23
QC400	–	field blank	15/12/23
QC500	–	Trip blank	15/12/23

QA\QC Project Requirements

QAQC	Required		Frequency		Method Used
Field Duplicates	☐ Yes	☐ No	☐ 1 in 10	☐ 1 in 20	
Field Triplicates	☐ Yes	☐ No	☐ 1 in 10	☐ 1 in 20	
Rinsate Blanks	☐ Yes	☐ No	☐ 1 per matrix/equipment/day		
Field Blanks	☐ Yes	☐ No	☐ 1 per day		
Trip Blanks	☐ Yes	☐ No	☐ 1 per ice chest		
Trip Spikes	☐ Yes	☐ No	☐ 1 per ice chest		

Approval and Distribution

Fieldwork Staff Signature _____ Date _____

Project Manager Signature _____ Date _____

Distribution: Project Central File

ANZ

FQM - Groundwater Sampling and Purging Record

AECOM

Q4AN(EV)-405-FM1

Project Name:	PFASOMP/WQMP	Project Number:	60612561/60719185	PM Name:	[redacted]	Sample Date:	28/11/23
Client:	Defence/Ventia	Project Location:	Robbo - CTA	Fieldwork Staff:		Well Development or Well Sampling Event? (circle)	

General Bore Information		Parameter Info.	Decontamination	Sampling Method	Hydrasleeve info.	
Date of GW Level:	Bore Radius (mm):	Chem Kit Serial No.:	☐ Decontaminated	☐ Low Flow Pump rate:	Hydrasleeve Size: 1L	Monitoring sequence followed (number in order):
Depth to GW (m-pvc):	Screen Interval (m):	Chem Kit Model:	☐ Dedicated	Intake depth:	Hydrasleeve Type:	
Bore Depth (m-pvc):	Casing Radius (mm):	Corrected Redox: Y / N	☐ Disposable	☐ Bailer ☒ Hydrasleeve	Sampling Depth (m-pvc):	1 Gauging
Depth to Product (m-pvc):	Cover Type (gatic/stick up):	(The correction to apply is probe dependent)	☐ Other (specify)	☐ Peristaltic Pump ☐ Waterra	Hydrasleeve Install time:	2 Hydrasleeve in
Product Thickness (m):	Bore Locked (YES/NO):	Parameter method: ☐ Downhole		☐ Other (specify)	Sampling Start Time: 8:29	3 Hydrasleeve out
	Key Type (if applicable):	☐ Retrieved				4 Parameters
Calculated bore volume (L):	Includes/ excludes bore annulus (circle)	# purge volumes removed:		Total purged volume (L):		

Water Quality Parameters

Location ID	Time	Turbidity ~~(NTU)~~ (mS/cm)	QAQC?	DO (ppm or mg/L)	E.C. (mS/cm or µS/cm)	pH	Redox (mV)	Temp °C	Odour, Colour, Turbidity
MW0040	8:29	4.835	100/200	3.65	332.5	6.88	-141.5	30.4	Colourless, low TB, NO, NS
SW086	9:31	1.1	101/201	1.48	47.6	5.04	115.0	29.8	very pale brown, low TB, NO, NS, no flow
SW123	10:00	1.0		2.27	55.5	6.05	94.8	28.8	colourless, low TB, NO, NS, mod flow
SW097	10:35	1.0		1.79	36.1	5.21	96.2	29.1	colourless, low TB, NO, NS, mod flow
Acceptable Parameter Range:				± 10%	± 3%	± 0.05	± 10 mV	± 0.2 °C	± 10% turbidity (if using a turbidity meter)

Analytes Sampled for:		Bottles Collected				QA/QC Information	Field Commets
Field Filtered:	Unfiltered:	x 40 mL Vial (HCl)	x 60 mL Ferrous	✓	x60 mL metals (HNO_3)	100, 200 QMP & WQMP 101, 201	Bore volume calculation, bore condition, fate of tubing, redox correction etc.
✓		x 40 mL Vial (H_2SO_4)	x 100 mL Amber	✓	x 250 mL Plastic		TB = turbidity
				✓	x60ml chromium		NO = no odour
							NS = no sheen

Approval and Distribution

[redacted]

28/11/23
Date

Checker Name and Signature

Date

Project Manager Signature

Date

Distribution: Project Central File

ANZ

FQM - Groundwater Sampling and Purging Record

AECOM

Q4AN(EV)-405-FM1

Project Name:	PFASOMP/WQMP	Project Number:	60612561/60719185	PM Name:	[redacted]	Sample Date:	11/12/23
Client:	Defence/Ventia	Project Location:	Robbo	Fieldwork Staff:		Well Development or Well Sampling Event? (circle)	

General Bore Information		Parameter Info.	Decontamination	Sampling Method	Hydrasleeve Info.	
Date of GW Level:	Bore Radius (mm):	Chem Kit Serial No.:	☐ Decontaminated	☐ Low Flow Pump rate:	Hydrasleeve Size:	Monitoring sequence followed (number in order):
Depth to GW (m-pvc):	Screen Interval (m):	Chem Kit Model:	☐ Dedicated	Intake depth:	Hydrasleeve Type:	
Bore Depth (m-pvc):	Casing Radius (mm):	Corrected Redox: Y / N	☐ Disposable	☐ Bailer ☐ Hydrasleeve	Sampling Depth (m-pvc):	Gauging
Depth to Product (m-pvc):	Cover Type (gatic/stick up):	(The correction to apply is probe dependent)	☐ Other (specify)	☐ Peristaltic Pump ☐ Waterra	Hydrasleeve Install time:	Hydrasleeve in
Product Thickness (m):	Bore Locked (YES/NO):	Parameter method: ☐ Downhole		☐ Other (specify)	Sampling Start Time:	Hydrasleeve out
	Key Type (if applicable):	☐ Retrieved				Parameters

Calculated bore volume (L):	Includes/ excludes bore annulus (circle)	# purge volumes removed:	Total purged volume (L):

Water Quality Parameters

Location ID	Time	Turbidity	QAQC?	DO (ppm or mg/L)	E.C. (mS/cm or µS/cm)	pH	Redox (mV)	Temp °C	Odour, Colour, Turbidity
SW004	16:45	99.9		3.47	117.7	5.32	-213.1	30.3	low-Mod TB, NO, NS, pale brown
SW001	16:30	149.5		3.76	32.2	6.30	-207.9	30.2	mod TB, NO, NS, brown
SW003	15:40	1056		3.76	44.1	6.15	-188.7	29.6	Mod-high TB, NO, NS, Red
SW070	17:45	0.8		5.05	21.7	6.92	-210.5	30.6	Clear, NO, NS, Tadpoles
SW059	18:20	0.2		4.09	48.5	6.81	-204.4	31.8	" no tadpoles
Acceptable Parameter Range:				± 10%	± 3%	± 0.05	± 10 mV	± 0.2 °C	± 10% turbidity (if using a turbidity meter)

Analytes Sampled for:		Bottles Collected						QA/QC Information	Field Commets
Field Filtered:	Unfiltered:		x 40 mL Vial (HCl)		x 60 mL Ferrous		x 60 mL metals (HNO_3)	SW059/204	Bore volume calculation, bore condition, fate of tubing, redox correction etc.
			x 40 mL Vial (H_2SO_4)		x 100 mL Amber		x 250 mL Plastic		

Approval and Distribution

Fieldwork Staff Signature _____ Date _____ Checker Name and Signature _____ Date _____

Project Manager Signature _____ Date _____ **Distribution:** Project Central File

ANZ

FQM - NAPL and Groundwater Level Gauging Record

AECOM

Q4AN(EV)-414-FM1

Project Name:	PFASOMP/WQMP	**Project Location:**	60612561/60719185	**PM Name:**	
Project Number:		**Client:**		**Fieldwork Staff Name:**	

Confirm NAPL and groundwater levels by repeat measurements. All columns must be completed. If NAPL is not present in a well write 'ND' (Not Detected) in the relevant column.

Field Data

Well ID	Date (dd/mm/yy)	Time (24hr:mm)	HS Install (m)	Depth to LNAPL (mBTOC)	Depth to Groundwater (mBTOC)	LNAPL Thickness (m)	Depth to DNAPL (mBTOC)	Total Well Depth (mBTOC)	DNAPL Thickness (m)	Comments (well condition, odour, NAPL colour and viscosity)
SW028			DO	EC	pH	REDOX	TEMP	Turbidity		Flow
SW028	14/12/23	14:30	5.35	52.0	8.34	78.6	28.1			Low TB, NO, NS, low flow
SW028	14/12/23	16:45	5.09	33.4	8.13	77.5	21.6			Low TB, NO, NS, Grassy, low flow
SW075	14/12/23	16:25	5.00	59.8	6.92	103.0	28.3	16.7		Low TB, NO, NS, low flow, grassy
SW202	15/12/23	8:44	4.48	69.6	7.81	91.5	28.5	17.7		low TB, colourless, NO, NS, Grassy, pooled
SW001/203	15/12/23	9:20	3.77	80.0	6.89	100.3	28.2	43.5		Mod TB, Organic sheen, organic odour, pooled
SW001/205	15/12/23	10:20	4.44	66.6	7.26	93.6	29.0	21.0		low TB, NO, NS, colourless, algae, grass.

very low flow (pale yellow)

Measurement Equipment

Make & Model:	YSI	**Supplier:**	
Serial No.:	B	**Calibration Report Provided?**	

Notes/Comments

(PID) - photo ionisation detector; (ppm) - parts per million; (LNAPL) - light non-aqueous phase liquids; (DNAPL) - dense light non-aqueous phase liquid; (mBTOC) - metres below top of casing

SW007 & SW203 = QC

Approval and Distribution

[redacted]

Date

Project Manager Signature Date

Distribution: Project Central File

AECOM

ANZ

FQM - Daily Activity Report

Q4AN(EV)-002-FM1

Project Name:	WQMP / OMP	**Project Number:**	60719185/60612561
Project Location:	Robertson Barracks	**Client:**	Ventia / DoD
Date of Fieldwork:	12-03-24	**PM Name:**	[redacted]
Time Arrive:	8:00	**Time Depart:**	16:30.

Administration

Personnel On-Site:	[redacted]
Contractors (Inducted, Downtime):	

Tasks Undertaken

Describe tasks and time of activities undertaken, observations, communications with PM, clients and subcontractors etc.

☐ Cross out unused portions of the site notes ☐ Indicate QAQC samples collected & note on tracking sheet

☐ Record number waste drums transported on & off-site ☐ Indicate observations of on-Site environmental receptors

Indicate Weather Conditions:

7:30 - Mobilise to site via Servo for Ice,

8:15 - Arrive onsite, drive to northern portion for sampling:

- MW058
- MW034 - QC101/201 for OMP.
- MW057 - degraded HC odour, LNAPL likely above Top screen
- MW062 + MW064 - degraded HC/LNAPL, not sampled
- MW054 HC odour, sampled.
- MW053 - LNAPL globules, not sampled
- MW012/MW012D
- MW035 - putrified odour + bent PVC @ ~1mbTOC.
- MW066 - extra amber + QC110/210.
- MW089 - degraded HC LNAPL, not sampled
- MW074
- MW056
- MW075 - broken gatic lid.
- MW003 - flooded below TOC.

15:00 - Depart site for more ice + paperwork/QCs.

16:00 - Drop samples @ ALS

16:30 - Home.

HSE Actions

Describe any HSE actions or oberservations or additional information that is not recorded in the HSEP

Approval and Dis[redacted]

[redacted] — Fieldwork Staff Signature

12-03-24 — Date

Distribution: Project Central File

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ANZ

FQM - Daily Activity Report

Q4AN(EV)-002-FM1

Project Name:	WQMP / OMP	**Project Number:**	60719185 / 606256
Project Location:	Robertson Barracks	**Client:**	Ventia / DoD
Date of Fieldwork:	7/3/24	**PM Name:**	[redacted]
Time Arrive:	6:45	**Time Depart:**	14:00

Administration

Personnel On-Site:	[redacted]
Contractors (Inducted, Downtime):	

Tasks Undertaken

Describe tasks and time of activities undertaken, observations, communications with PM, clients and subcontractors etc.

☐Cross out unused portions of the site notes ☐ Indicate QAQC samples collected & note on tracking sheet

☐ Record number waste drums transported on & off-site ☐ Indicate observations of on-Site environmental receptors

Indicate Weather Conditions:

6:45 - Mobilise to site
7:15 - Sample SW007
8:07 - & " SW204/059 - QC101/201 (comp)
9:20 - Gauge & sample MW052
9:45 - " ~~MW053~~ MW083
10:33 - " MW106
11:20 - " MW108

Sign in to Helicopter area wait for escort.

→ Mobilise to lab & organise / drop off samples

8/3/24 - Collect SW201/075

HSE Actions

Describe any HSE actions or oberservations or additional information that is not recorded in the HSEP

Approval and Distribution

[redacted] — Fieldwork Staff Signature

7/3/24 — Date

Distribution: Project Central File

AECOM

ANZ

FQM - Daily Activity Report

Q4AN(EV)-002-FM1

Project Name:	WQMP/ OMP	**Project Number:**	60719185/60612561
Project Location:	Robertson Barracks	**Client:**	Ventia / DoD
Date of Fieldwork:	6/3/24	**PM Name:**	[redacted]
Time Arrive:	~~7:00~~ 6:30	**Time Depart:**	17:00

Administration

Personnel On-Site:	[redacted]
Contractors (Inducted, Downtime):	

Tasks Undertaken

Describe tasks and time of activities undertaken, observations, communications with PM, clients and subcontractors etc.

☐Cross out unused portions of the site notes ☐ Indicate QAQC samples collected & note on tracking sheet

☐ Record number waste drums transported on & off-site ☐ Indicate observations of on-Site environmental receptors

Indicate Weather Conditions:

6:30 - Mobilise to site + ice
7:05 - gauge & sample MW001 + organise esky's
8:00 - sample SW206
8:27 - Sample SW203/007
9:14 - gauge & sample MW085
9:44 - gauge & sample MW051
10:42 - " " MW079
11:18 - " " MW100 - QC 112/212
- lunch - organise samples - ~~go to lab drop off samples~~
13:00 - sign in @ Fuel Farm - induction
13:09 - gauge & sample MW105
13:35 - " " MW103
14:34 - " " MW091 - sign in
14:58 - " " MW090
15:55 - " " SW070

Mobilise back to DWN

HSE Actions

Describe any HSE actions or oberservations or additional information that is not recorded in the HSEP

Approval and Distribution

[redacted]
Fieldwork Staff Signature

6/3/24
Date

Distribution: Project Central File

AECOM

ANZ

FQM - Daily Activity Report

Q4AN(EV)-002-FM1

Project Name:	WQMP / OMP	**Project Number:**	60719185 / 60612561
Project Location:	Robertson Barracks	**Client:**	Ventia / DoD
Date of Fieldwork:	5/3/24	**PM Name:**	[redacted]
Time Arrive:	7:00	**Time Depart:**	16:50

Administration

Personnel On-Site:	[redacted]
Contractors (Inducted, Downtime):	

Tasks Undertaken

Describe tasks and time of activities undertaken, observations, communications with PM, clients and subcontractors etc.

☐ Cross out unused portions of the site notes ☐ Indicate QAQC samples collected & note on tracking sheet

☐ Record number waste drums transported on & off-site ☐ Indicate observations of on-Site environmental receptors

Indicate Weather Conditions:

07:00 Arrive Mobi

07:00 - Mobilise to site

7:45 Arrive @ MW004 - call from Ventia colleague for help with their samples, organise that

8:00 8:15 - Mobilise to SBRS

↳ sign in + induction

9:09 - Gauge & Sample MW103 - QC100

9:54 - Gauge & sample MW102 - QC200

→ MW101 was not able to be sampled as the well has been partially asphalted over, unable to open the well

↳ photo taken by onsite POC for record

- escorted to MW112 (10:42) & MW113 (10:46)

~ 11:00 - leave SBRS

↳ Lunch & organising samples

13:33 - gauge & sample MW004 & MW004D

14:40 - gauge & sample MW080 - starts to rain

15:30 - SW samples taken (SW004, SW023, SW028, SW202)

SW003 16:55 - mobilise to DWN.

HSE Actions

Describe any HSE actions or oberservations or additional information that is not recorded in the HSEP

Driving

Approval and D[redacted]

[redacted]

Fieldwork Staff Signature

5/3/24

Date

Distribution: Project Central File

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FQM - Daily Activity Report

Q4AN(EV)-002-FM1

Project Name:	[redacted] WQMPIOM	**Project Number:**	60719185/ 60612561
Project Location:	Robertson Barracks	**Client:**	Ventia/ DoD
Date of Fieldwork:	1/3/24	**PM Name:**	[redacted]
Time Arrive:	9:30	**Time Depart:**	~~PM~~ 14:00

Administration

Personnel On-Site:	[redacted]
Contractors (Inducted, Downtime):	

Tasks Undertaken

Describe tasks and time of activities undertaken, observations, communications with PM, clients and subcontractors etc.

☐Cross out unused portions of the site notes ☐ Indicate QAQC samples collected & note on tracking sheet

☐ Record number waste drums transported on & off-site ☐ Indicate observations of on-Site environmental receptors

Indicate Weather Conditions:

9:00 - Mobilise to site

9:30 - Sign into CTA @ range control

9:45 - Gauge & sample MW018

10:40 - Sample SW086

11:00 - Gauge & sample MW021 & MW021D

12:00 - Sample SW123

12:22 - Gauge & sample MW023 (small amount of water)

13:08 - Sample SW091

Mobilise back to Darwin

HSE Actions

Describe any HSE actions or oberservations or additional information that is not recorded in the HSEP

Steep cliffs for same SW sites

Approval and Distribution

[redacted]

Fieldwork Staff Signature

1/3/24

Date

Distribution: Project Central File

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FQM - Daily Activity Report

Q4AN(EV)-002-FM1

Project Name:	PFASOMP	**Project Number:**	60612561
Project Location:	ROBBO	**Client:**	Defence
Date of Fieldwork:	29/02/24	**PM Name:**	[redacted]
Time Arrive:		**Time Depart:**	

Administration

Personnel On-Site:	[redacted]
Contractors (Inducted, Downtime):	

Tasks Undertaken

Describe tasks and time of activities undertaken, observations, communications with PM, clients and subcontractors etc.

☐ Cross out unused portions of the site notes ☐ Indicate QAQC samples collected & note on tracking sheet

☐ Record number waste drums transported on & off-site ☐ Indicate observations of on-Site environmental receptors

Indicate Weather Conditions:

1230 - Arrived @ MW004 + MW004D - de-rooted MW004

1253 - Arrived @ MW080

1304 - Arrived back at MW004 - re-installed HS

1315 - Arrived @ MW012/MW012D

1350 - MW057 gauged, LNAPL not measurable but on probe, HS dropped.

HSE Actions

Describe any HSE actions or oberservations or additional information that is not recorded in the HSEP

Approval and Distribution

[redacted]

Fieldwork Staff Signature

29/3/24

Date

Distribution: Project Central File

ıwater Level Gauging Record

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Q4AN(EV)-414-FM1

Project Name:	PFASOMP	**Project Location:**	Robbs	**PM Name:**	[redacted]
Project Number:	60612561	**Client:**	Defence	**Fieldwork Staff Name:**	

Confirm NAPL and groundwater levels by repeat measurements. All columns must be completed. If NAPL is not present in a well write 'ND' (Not Detected) in the relevant column.

Field Data

Well ID	Date (dd/mm/yy)	Time (24hr:mm)	HS Install (m)	Depth to LNAPL (mBTOC)	Depth to Groundwater (mBTOC)	LNAPL Thickness (m)	Depth to DNAPL (mBTOC)	Total Well Depth (mBTOC)	DNAPL Thickness HS (m)	Comments (well condition, odour, NAPL colour and viscosity)
MW004	29/2/24	12:40			2.828			8.111	✓	Bore rocked, GC, Pack, NO, NS
MW010		12:45			2.755				✓	GC, NO, NS
MW080		12:55			2.435				✓	GC, NO, NS
MW012		13:15			3.012				✓	GC, NO, NS
MW012D		13:20			4.612				✓	GC, NO, NS
MW034		13:39			2.373				✓	GC, NO, NS
MW057		13:50			3.461				✓	GC, NO, NS
MW064		14:00			2.891				✓	GC, no lid, HC odour, LNAPL on probe - black
MW062		1515			3.885				✓	GC, NO, NS, no screws, HC odour,
MW066		1505			2.671				✓	GC, HC odour, LNAPL on probe - black
MW053		1520							✓	
MW054		1525			2.929				✓	No reading, black LNapl, missing
MW035		15:50			2.041				✓	GC, HC odour, LNAPL on probe - black
MW031		15:57			2.152				✓	GC, NO, NS
MW001		1600			0.746				✓	GC, NO, NS
MW029		16:05			1.677				✓	GC, NO, NS
MW018	1/3/24	9:45			2.400				✓	GC, NO, NS
MW021		11:00			2.231			8.72	✓	GC, NO, NS
MW021D		11:10			1.907			8.721	✓	GC, NO, NS
MW023		12:35			5.925			20.61	✓	GC, NO, NS - organic odour
								8.55		GC, NO, NS

HC on probe - black w, probe

Measurement Equipment

Make & Model:		**Supplier:**	
Serial No.:		**Calibration Report Provided?**	

Notes/Comments

(PID) - photo ionisation detector; (ppm) - parts per million; (LNAPL) - light non-aqueous phase liquids; (DNAPL) - dense light non-aqueous phase liquid; (mBTOC) - metres below top of casing

Approval and Distribution

Fieldwork Staff Signature Date

Project Manager Signature Date

Distribution: Project Central File

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FQM - Groundwater Sampling and Purging Record

Q4AN(EV)-405-FM1

Project Name:	WQMP/OMP	Project Number:	60699185 / 60612561	PM Name:	[redacted]	Surface Water/Groundwater:	GW/SW
Client:	Yenta / DOD	Project Location:		Fieldwork Staff:		Well Development or Well Sampling Event? (circle)	

General Bore Information		Parameter Info.	Decontamination	Sampling Method	Hydrasleeve Info.	
Date of GW Level:	Bore Radius (mm):	Chem Kit Serial No.: 451	☑ Decontaminated	☐ Low Flow Pump rate:	Hydrasleeve Size: 1 L	Monitoring sequence followed (number in order):
Depth to GW (m-pvc):	Screen Interval (m):	Chem Kit Model: B	☑ Dedicated	Intake depth:	Hydrasleeve Type:	
Bore Depth (m-pvc):	Casing Radius (mm):	Corrected Redox: Y / (N)	☐ Disposable	☐ Bailer ☐ Hydrasleeve	Sampling Depth (m-pvc):	2 Gauging
Depth to Product (m-pvc):	Cover Type (gatic/stick up):	(The correction to apply is probe dependent)	☐ Other (specify)	☐ Peristaltic Pump ☐ Waterra	Hydrasleeve Install time:	1 Hydrasleeve in
Product Thickness (m):	Bore Locked (YES/NO):	Parameter method: ☐ Downhole		☐ Other (specify)	Sampling Start Time:	3 Hydrasleeve out
	Key Type (if applicable):	☐ Retrieved				4 Parameters
Calculated bore volume (L):	Includes/ excludes bore annulus (circle)	# purge volumes removed:		Total purged volume (L):		

Water Quality Parameters

	Location ID	Date	QA/QC	Turbidity (NTU)	DO (ppm or mg/L)	E.C. (mS/cm or µS/cm)	pH	Redox (mV)	Temp °C	Odour, Colour, Turbidity
14:40	MW080	6/3/24	–		1.41	96.9	5.36	106.1	31.1	Colourless, low TB, NO, NS, roots @ top & bottom
15:30	SW004	5/3/24	–		3.85	36.8	6.54	80.7	30.1	Pale Red, mod TB, NO, NS, low flow
16:07	SW023	"	–		5.22	30.1	7.04	81.7	30.5	colourless, low TB, NO, NS, algae & grass
6:26	SW028	"	–		3.40	14.4	6.54	73.0	31.7	" grass
6:48	SW202	"	–		4.90	41.2	6.87	73.0	35.3	"
7:25	SW003	7/3/24	–		4.74	11.5	6.24	11.0	26.2	Pale brown, low TB, NO, NS, peaty
7:30	SW001	"	–		4.01	36.8	5.55	32.2	28.6	"
6:07	SW204/1059	"	QUP-104/59		3.68	20.4	5.93	33.4	27.6	Colourless, low TB, NO, NS, low flow
9:20	MW052	"	–		1.52	121.4	5.87	59.3	30.1	Colourless, low TB, NO, NS, HC odour, hydrocarbon
9:45	MW053	"	–		2.37	53.4	5.48	57.8	29.8	colourless, low TB, " sediment @ bottom
10:33	MW106	"	–		0.86	41.3	5.26	63.9	33.0	" no seal.
11:20	MW108	"	–		1.62	25.4	4.91	113.2	32.7	"
	SW201/1058	6/3/24	–		4.13	20.2	5.70	24.2	29.5	Colourless, low TB, NO, NS, low flow
	Acceptable Parameter Range:				± 10%	± 3%	± 0.05	± 10 mV	± 0.2 °C	± 10% turbidity (if using a turbidity meter)

Analytes Sampled for:		Bottles Collected						QA/QC Information	Field Comments
Field Filtered:	Unfiltered:	x 40 mL Vial (HCl)		x 60 mL Ferrous		x 60 mL metals (HNO_3)		QC101/201	Bore volume calculation, bore condition, fate of tubing, redox correction etc.
		x 40 mL Vial (H_2SO_4)		x 100 mL Amber		x 250 mL Plastic			TB - Turbidity NO - no odour NS - no sheen

Approval and Distribution

Fieldwork Staff Signature _____ Date _____ Checker Name and Signature _____ Date _____

Project Manager Signature _____ Date _____ **Distribution:** Project Central File

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FQM - Groundwater Sampling and Purging Record

Q4AN(EV)-405-FM1

Project Name:	OMP/BQEMP	Project Number:	60612561/60719165	PM Name:	[redacted]	Surface Water/Groundwater:	SW/GW
Client:	Defence/Ventia	Project Location:	Robbo	Fieldwork Staff:		Well Development or Well Sampling Event? (circle)	

General Bore Information		Parameter Info.	Decontamination	Sampling Method	Hydrasleeve Info.	
Date of GW Level:	Bore Radius (mm):	Chem Kit Serial No.: 457	☑ Decontaminated	☐ Low Flow Pump rate:	Hydrasleeve Size: 1L	Monitoring sequence followed (number in order):
Depth to GW (m-pvc):	Screen Interval (m):	Chem Kit Model: b	☑ Dedicated	Intake depth:	Hydrasleeve Type:	
Bore Depth (m-pvc):	Casing Radius (mm):	Corrected Redox: Y / (N)	☐ Disposable	☐ Bailer ☐ Hydrasleeve	Sampling Depth (m-pvc):	2 Gauging
Depth to Product (m-pvc):	Cover Type (gatic/stick up):	(The correction to apply is probe dependent)	☐ Other (specify)	☐ Peristaltic Pump ☐ Waterra	Hydrasleeve Install time:	1 Hydrasleeve in
Product Thickness (m):	Bore Locked (YES/NO):	Parameter method: ☐ Downhole		☐ Other (specify)	Sampling Start Time:	3 Hydrasleeve out
	Key Type (if applicable):	☐ Retrieved				4 Parameters
Calculated bore volume (L):	Includes/ excludes bore annulus (circle)	# purge volumes removed:		Total purged volume (L):		

Water Quality Parameters

Location ID	Date	QA/QC	Turbidity (NTU)	DO (ppm or mg/L)	E.C. (mS/cm or µS/cm)	pH	Redox (mV)	Temp °C	Odour, Colour, Turbidity
9:35 MW030	8/3/24			2.95	31.3	4.89	59.7	29.6	Brown, mod TB, NO, NS, sediment bottom
9:55 MW029	"			3.59	37.9	5.31	71.8	30.9	Brown, mod TB, NO, NS, sediment
10:30 MW031	"			0.72	45.0	5.10	75.4	31.1	Pale brown, low TB, NO organic layer, Sedi
11:00 MW032	"			1.72	41.4	5.42	69.8	31.5	Colourless, low TB, NO, NS, sediment
Acceptable Parameter Range:				± 10%	± 3%	± 0.05	± 10 mV	± 0.2 °C	± 10% turbidity (if using a turbidity meter)

Analytes Sampled for:		Bottles Collected						QA/QC Information	Field Comments
Field Filtered:	Unfiltered:		x 40 mL Vial (HCl)		x 60 mL Ferrous		x 60 mL metals (HNO_3)		Bore volume calculation, bore condition, fate of tubing, redox correction etc.
			x 40 mL Vial (H_2SO_4)		x 100 mL Amber		x 250 mL Plastic		TB- turbidity NO- no odour NS- no sheen

Approval and Distribution

Fieldwork Staff Signature _____ Date _____ Checker Name and Signature _____ Date _____

Project Manager Signature _____ Date _____ Distribution: Project Central File

ANZ

FQM - Groundwater Sampling and Purging Record

AECOM

Q4AN(EV)-405-FM1

Project Name:	WBUP/OMP	Project Number:	60719185 / 60612561	PM Name:	[redacted]	Surface Water/Groundwater:	GW
Client:	Defence / Ventia	Project Location:	Robbs.	Fieldwork Staff:		Well Development or Well Sampling Event? (circle)	

General Bore Information		Parameter Info.	Decontamination	Sampling Method	Hydrasleeve Info.	
Date of GW Level:	Bore Radius (mm):	Chem Kit Serial No.: 95i	☑ Decontaminated	☐ Low Flow Pump rate:	Hydrasleeve Size: 1 L	Monitoring sequence followed (number in order):
Depth to GW (m-pvc):	Screen Interval (m):	Chem Kit Model: B	☑ Dedicated	Intake depth:	Hydrasleeve Type:	
Bore Depth (m-pvc):	Casing Radius (mm):	Corrected Redox: (Y) N	☐ Disposable	☐ Bailer ☐ Hydrasleeve	Sampling Depth (m-pvc):	1,2 Gauging
Depth to Product (m-pvc):	Cover Type (gatic/stick up):	(The correction to apply is probe dependent)	☐ Other (specify)	☐ Peristaltic Pump ☐ Waterra	Hydrasleeve Install time:	2 Hydrasleeve in
Product Thickness (m):	Bore Locked (YES/NO):	Parameter method: ☐ Downhole		☐ Other (specify)	Sampling Start Time:	3 Hydrasleeve out
	Key Type (if applicable):	☐ Retrieved				4 Parameters
Calculated bore volume (L):	Includes/ excludes bore annulus (circle)	# purge volumes removed:		Total purged volume (L):		

Water Quality Parameters

	Location ID	Date	QA/QC	Turbidity (NTU)	DO (ppm or mg/L)	E.C. (mS/cm or µS/cm)	pH	Redox (mV)	Temp °C	Odour, Colour, Turbidity
10:02	MW018	1/3/24	–		2.45*	61.7	6.95	90.8	30.3	Brown, mod. TB, NO, NS
10:40	SW086	"	–		7.38*	25.6	6.64	83.0	30.6	Colourless, low TB, NO, NS, low flow
11:20	MW021	"	–		19.34*	35.8	6.40	112.2	30.2	Pale brown, low TB, NO, NS
11:18	MW021D	"	–		0.96*	129.1	6.53	116.1	30.3	Colourless, low TB, NO, NS,
12:00	SW123	"	–		5.20*	32.8	6.31	76.1	31.7	" mod. flow
12:22	MW023	"	–		~~21.66~~	94.9	6.31	120.0	31.8	Small amt. of water "
13:08	SW091	"	–		21.66*	27.3	6.75	43.9	32.3	"
9:09	MW103	5/3/24	–		3.74	538	6.72	80.3	31.7	Pale brown, low TB, NO, NS, sediment @ bottom
9:54	MW102	"	–		4.35	57.1	5.60	78.5	33.0	" → worm
10:42	MW112	"	–		5.22	8.6	5.70	265.7	35.7	colourless, low TB, NO, NS
10:46	MW113	"	–		1.99	392.3	6.95	100.3	36.8	"
13:33	MW004	"	–		1.23	73.0	5.18	98.2	33.9	colourless, orange organic matter, NO NS, Low TB
14:02	MW004D	"	–		~~2.91~~	~~395.8~~	6.67	4.3	32.9	colourless, low TB, organic odour, no sheen
	Acceptable Parameter Range:				± 10%	± 3%	± 0.05	± 10 mV	± 0.2 °C	± 10% turbidity (if using a turbidity meter)

Analytes Sampled for:		Bottles Collected						QA/QC Information
Field Filtered:	Unfiltered:		x 40 mL Vial (HCl)		x 60 mL Ferrous		x 60 mL metals (HNO_3)	
			x 40 mL Vial (H_2SO_4)		x 100 mL Amber		x 250 mL Plastic	

Field Comments

Bore volume calculation, bore condition, fate of tubing, redox correction etc.

TB - turbidity
NO - no odour
NS - no sheen

Approval and Distribution

Fieldwork Staff Signature _____ Date _____ Checker Name and Signature _____ Date _____

Project Manager Signature _____ Date _____ Distribution: Project Central File

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FQM - Groundwater Sampling and Purging Record

Q4AN(EV)-405-FM1

Project Name:	PFAS OMP	Project Number:	60612561	PM Name:	[redacted]	Sample Date:	12-03-24
Client:	DoD	Project Location:	Robertson Barracks	Fieldwork Staff:	[redacted]	Well Development or Well Sampling Event? (circle)	

General Bore Information		Parameter Info.	Decontamination	Sampling Method	Hydrasleeve info.	
Date of GW Level:	Bore Radius (mm):	Chem Kit Serial No.: D	☑ Decontaminated	☐ Low Flow Pump rate:	Hydrasleeve Size: 1L	Monitoring sequence followed (number in order):
Depth to GW (m-pvc):	Screen Interval (m):	Chem Kit Model: YSI	☑ Dedicated	Intake depth:	Hydrasleeve Type: HDPE	
Bore Depth (m-pvc):	Casing Radius (mm):	Corrected Redox: Y / (N)	☑ Disposable	☐ Bailer ☑ Hydrasleeve	Sampling Depth (m-pvc):	1 Gauging
Depth to Product (m-pvc):	Cover Type (gatic/stick up):	(The correction to apply is probe dependent)	☐ Other (specify)	☐ Peristaltic Pump ☐ Waterra	Hydrasleeve install time:	2 Hydrasleeve in
Product Thickness (m):	Bore Locked (YES/NO):	Parameter method: ☐ Downhole ☑ Retrieved		☐ Other (specify)	Sampling Start Time:	3 Hydrasleeve out
	Key Type (if applicable):					4 Parameters
Calculated bore volume (L):	Includes/ excludes bore annulus (circle)	# purge volumes removed:		Total purged volume (L):		

Water Quality Parameters

Location ID	Time	Type	QAQC?	DO (ppm or mg/L)	E.C. (mS/cm or µS/cm)	pH	Redox (mV)	Temp °C	Odour, Colour, Turbidity
MW034	9:00	HS	QC101/201	5.22	100.2	5.98	96.9	30.2	White, low turb, no odour, organic ~~stream~~
MW012	10:40	HS	—	4.22	123.5	6.88	102.1	30.3	Colourless, low turb, no odour, no s
MW012D	10:50	HS	—	4.18	132.0	6.92	131.2	30.4	Colourless, low turb, no odour, no s.
MW066	12:00	HS	—	5.21	120.8	6.25	110.8	30.4	Grey, low turb, no odour, no sheen
~~MW074~~	13:20	HS							
Acceptable Parameter Range:				± 10%	± 3%	± 0.05	± 10 mV	± 0.2 °C	± 10% turbidity (if using a turbidity meter)

Analytes Sampled for:		Bottles Collected			QA/QC Information	Field Commets
Field Filtered:	Unfiltered:	x 40 mL Vial (HCl)	x 60 mL Ferrous	x 60 mL metals (HNO_3)	QA/QC/210 Marked	Bore volume calculation, bore condition, fate of tubing, redox correction etc.
0	2	x 40 mL Vial (H_2SO_4)	x 100 mL Amber	x 250 mL Plastic		1x Extra amber @ MW066.
		2 x PFAS				

Approval and Distribution

[redacted]	12-03-24	Checker Name and Signature	Date
Project Manager Signature	Date	Distribution: Project Central File	

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FQM - Groundwater Sampling and Purging Record

Q4AN(EV)-405-FM1

Project Name:	WQMP	**Project Number:**	60719185	**PM Name:**	[redacted]	**Surface Water/Groundwater:**	GROUNDWATER
Client:	Ventia	**Project Location:**	Roberston B.	**Fieldwork Staff:**		**Well Development or Well Sampling Event? (circle)**	

General Bore Information		Parameter Info.	Decontamination	Sampling Method	Hydrasleeve info.	
Date of GW Level:	Bore Radius (mm):	Chem Kit Serial No.: # D	☑ Decontaminated	☐ Low Flow Pump rate:	Hydrasleeve Size: 1 L.	Monitoring sequence followed (number in order):
Depth to GW (m-pvc):	Screen Interval (m):	Chem Kit Model: YSI	☑ Dedicated	Intake depth:	Hydrasleeve Type: HDPE	
Bore Depth (m-pvc):	Casing Radius (mm):	**Corrected Redox:** Y / (N)	☑ Disposable	☐ Bailer ☑ Hydrasleeve	Sampling Depth (m-pvc): Base	1 Gauging
Depth to Product (m-pvc):	Cover Type (gatic/stick up):	(The correction to apply is probe dependent)	☐ Other (specify)	☐ Peristaltic Pump ☐ Waterra	Hydrasleeve Install time: —	2 Hydrasleeve in
Product Thickness (m):	Bore Locked (YES/NO):	**Parameter method:** ☐ Downhole	IP-decon	☐ Other (specify)	Sampling Start Time: —	3 Hydrasleeve out
	Key Type (if applicable):	☑ Retrieved	HS-D+D			4 Parameters
Calculated bore volume (L):	Includes/ excludes bore annulus (circle)	# purge volumes removed:		Total purged volume (L):		

Water Quality Parameters

Location ID	Date	QA/QC	Turbidity (NTU)	DO (ppm or mg/L)	E.C. (mS/cm or µS/cm)	pH	Redox (mV)	Temp °C	Odour, Colour, Turbidity
MW058	12-03-24	—	0.2	4.33	132.3	5.90	90.9	30.3	Pale brown, mod turb, no, ns
MW034		—	9.2	5.22	100.2	5.98	96.9	30.2	White, low turb organic odour, ns.
MW057		—	3.2	5.01	122.4	5.03	120.2	30.1	Grey, low turb, degraded HC odour + sheen.
MW054		—	12.8	5.67	102.9	5.89	21.2	29.1	Orange, moderate turb, HC odour + sheen.
MW035		—	2.4	8.02	221.2	6.20	101.2	30.2	Grey, low turb, pentrified/organic od, no sheen.
MW066		QC+D/2D	22.1	5.21	120.8	6.25	110.8	30.4	Grey, low turb, no, ns.
MW074		QC III/2D	24.2	5.48	122.8	6.21	115.8	31.2	Grey, mod turb, no, ns.
MW056		—	42.1	5.99	101.2	6.40	128.2	32.0	Orange, mod turb, no, ns.
MW075		—	10.2	6.20	220.2	6.59	132.2	32.0	Orange, mod turb, no, ns
MW003		—	24.8	6.23	201.2	6.45	130.9	32.0	Grey, moderate turb, no, ns.
Acceptable Parameter Range:				± 10%	± 3%	± 0.05	± 10 mV	± 0.2 °C	± 10% turbidity (if using a turbidity meter)

Analytes Sampled for:		Bottles Collected						QA/QC Information	Field Comments
Field Filtered:	**Unfiltered:**	x 40 mL Vial (HCl)		x 60 mL Ferrous		x 60 mL metals (HNO_3)		MW066	Bore volume calculation, bore condition, fate of tubing, redox correction etc.
		x 40 mL Vial (H_2SO_4)		x 100 mL Amber		x 250 mL Plastic			no - no odour ns - no sheen • Extra amber @ MW066

Approval and Distribution

[redacted] nature — 12-03-24 Date — Checker Name and Signature — Date

Project Manager Signature — Date — **Distribution:** Project Central File

ANZ

FQM - Groundwater Sampling and Purging Record

AECOM

Q4AN(EV)-405-FM1

Project Name:	WQMP/OMP	**Project Number:**	60719857/60612561	**PM Name:**	[redacted]	**Surface Water/Groundwater:**	SW/GW
Client:	Ventia/DOD	**Project Location:**	Robertson Barracks	**Fieldwork Staff:**		**Well Development or Well Sampling Event? (circle)**	

General Bore Information		Parameter Info.	Decontamination	Sampling Method	Hydrasleeve Info.	
Date of GW Level:	Bore Radius (mm):	Chem Kit Serial No.: 451	☑ Decontaminated	☐ Low Flow Pump rate:	Hydrasleeve Size: 1L	Monitoring sequence followed (number in order):
Depth to GW (m-pvc):	Screen Interval (m):	Chem Kit Model: 13	☑ Dedicated	Intake depth:	Hydrasleeve Type:	
Bore Depth (m-pvc):	Casing Radius (mm):	Corrected Redox: Y / (N)	☑ Disposable	☐ Bailer ☐ Hydrasleeve	Sampling Depth (m-pvc):	2 Gauging
Depth to Product (m-pvc):	Cover Type (gatic/stick up):	(The correction to apply is probe dependent)	☐ Other (specify)	☐ Peristaltic Pump ☐ Waterra	Hydrasleeve Install time:	1½ Hydrasleeve in
Product Thickness (m):	Bore Locked (YES/NO):	Parameter method: ☐ Downhole		☐ Other (specify)	Sampling Start Time:	3 Hydrasleeve out
	Key Type (if applicable):	☐ Retrieved				4 Parameters
Calculated bore volume (L):	Includes/ excludes bore annulus (circle)	# purge volumes removed:		Total purged volume (L):		

Water Quality Parameters

Location ID	Date	QA/QC	Turbidity (NTU)	DO (ppm or mg/L)	E.C. (mS/cm or µS/cm)	pH	Redox (mV)	Temp °C	Odour, Colour, Turbidity
7:05 MW001	6/3/24	–		0.82	53.2	5.05	94.6	27.1	Pale brown, mod TB, NO, NS, sediment @ bottom
8:00 SW206	"	–		1.31	36.9	5.23	78.9	29.1	Colourless, low TB, NO, NS, grass, algae, no flow
8:27 SW203	0917	–		2.54	21.0	5.52	73.2	29.5	" ex. low flow
9:14 MW085	"	–		1.66	38.6	4.70	111.4	28.4	Brown, Mod. TB, NO, NS, lots of sediment @ bottom
9:42 MW051	"	–		2.17	45.0	5.14	93.9	29.1	Grey brown, mod, TB, NO, NS, sediment @ bottom, ppt @ top
10:42 MW079	"	–		2.01	40.0	4.72	102.5	27.0	" no rocks
11:18 MW100	"	11/2/212		2.24	40.9	4.65	111.8	26.6	Colourless, low TB, NO, light sheen (grey), sediment @ bottom
13:09 MW105	"	–		1.25	52.5	5.37	78.9	30.0	Colourless, low TB, HC odour, sheen
13:35 MW103	"	–		1.73	6.32	5.22	89.5	30.2	"
12:54 MW091	"	–		1.00	35.6	5.52	71.7	28.2	Pale brown, Mod TB, NO, sheen HC
14:58 MW090	"	–		3.74	46.4	5.83	89.4	29.6	Pale brown, mod TB, NO, sheen, bleach & labolas, HC
~~DUP01~~	"								
15:55 SW070	"	15:55		4.32	21.4	5.10	77.6	31.4	Colourless, low TB, NO, NS, Algae,
Acceptable Parameter Range:				± 10%	± 3%	± 0.05	± 10 mV	± 0.2 °C	± 10% turbidity (if using a turbidity meter)

Analytes Sampled for:		Bottles Collected						QA/QC Information	Field Comments
Field Filtered:	Unfiltered:		x 40 mL Vial (HCl)		x 60 mL Ferrous		x 60 mL metals (HNO_3)	QC112/212	Bore volume calculation, bore condition, fate of tubing, redox correction etc.
			x 40 mL Vial (H_2SO_4)		x 100 mL Amber		x 250 mL Plastic		TB - turbidity
									NO - No odour
									NS - no sheen

Approval and Distribution

Fieldwork Staff Signature _____ Date _____ Checker Name and Signature _____ Date _____

Project Manager Signature _____ Date _____ **Distribution:** Project Central File

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FQM - Sample QAQC Tracking Sheet

Q4AN(EV)-011-FM1

Project Name:	60719185 - WQMP	**Project Number:**	WQMP - 60719185
Project Location:	Melbo / SBRS	**Client:**	Ventia
PM Name:	[redacted]	**Fieldwork Staff:**	[redacted]

QAQC Information

QAQC ID	Primary Sample ID	Sample Type	Date
QC112	MW100	Dup	6/3/24
QC212	MW100	Trip	6/3/24
QC310	Sampling pole	Rinsate	1/3/24
QC410	Glove	Field Blank	1/3/24
QC510	—	Trip Blank	1/3/24
QC311	Glove	Rinsate	5/3/24
QC411	—	Field blank	5/3/24
QC511	—	Trip Blank	5/3/24
QC312	Glove	Rinsate	6/3/24
QC412	—	Field Blank	6/3/24
QC512	—	Trip Blank	6/3/24
QC313	Sampling pole	Rinsate	7/3/24
QC413	[redacted]	Field Blank	7/3/24
QC314	Glove	Rinsate	8/3/24
QC414	—	Field Blank	8/3/24
QC514	—	Trip Blank	8/3/24
QC110	MW066	Intra	12-03-24
QC210	MW066	Inter	
QC111	MW074	Intra	
QC211	MW074	Inter	
QC310	I.P	Rinsate.	
QC410	—	F-B	
QC510	—	T B	
SBRS!			
QC100	MW103	Dup	5/3/24
QC200	MW802	Trip	
QC300	Glove	Rinsate	
QC400	—	Field Blank	
QC500	—	Trip Blank	
QC301	Glove	Rinsate	6/3/24
QC401		Field Blank	6/3/24
QC307	Glove	Rinsate	7/3/24
QC402	—	Field Blank	7/3/24

QA\QC Project Requirements

QAQC	Required		Frequency		Method Used
Field Duplicates	☑ Yes	☐ No	☑ 1 in 10	☐ 1 in 20	
Field Triplicates	☑ Yes	☐ No	☑ 1 in 10	☐ 1 in 20	
Rinsate Blanks	☑ Yes	☐ No	☑ 1 per matrix/equipment/day		
Field Blanks	☑ Yes	☐ No	☑ 1 per day		
Trip Blanks	☑ Yes	☐ No	☑ 1 per ice chest		
Trip Spikes	☐ Yes	☑ No	☐ 1 per ice chest		

Approval and Distribution

Fieldwork Staff Signature _____ Date _____

Project Manager Signature _____ Date _____

Distribution: Project Central File

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ANZ

FQM - Sample QAQC Tracking Sheet

Q4AN(EV)-011-FM1

Project Name:	60612561-QMP	**Project Number:**	60612561-QMP
Project Location:	Rabbo	**Client:**	Defence
PM Name:	[redacted]	**Fieldwork Staff:**	[redacted]

QAQC Information

QAQC ID	Primary Sample ID	Sample Type	Date
QC100	MW0041D	Dup	7/3/24
QC200	MW0041D	Trip	"
QC300	Sampling Pole	Rinsate	"
QC400	—	Field Blank	"
QC500	—	Trip Blank	—
QC301	Glove	Rinsate	7/3/24
QC401	—	Field blank	7/3/24
QC302	Glove	Rinsate	7/3/24
QC402	—	Field blank	7/3/24
QC303	Sampling Pole	Rinsate	7/3/24
QC403	—	Field Blank	7/3/24
QC304	Glove	Rinsate	8/3/24
QC404	—	Field Blank	8/3/24
QC101	MW034	Intra	12.03.24
QC201	MW034	Inter	"
QC300	I.P	Rinsate	"
QC400	—	F.B	"
QC500	—	T.B	"

QA\QC Project Requirements

QAQC	Required		Frequency		Method Used
Field Duplicates	☑ Yes	☐ No	☑ 1 in 10	☐ 1 in 20	
Field Triplicates	☑ Yes	☐ No	☑ 1 in 10	☐ 1 in 20	
Rinsate Blanks	☑ Yes	☐ No	☑ 1 per matrix/equipment/day		
Field Blanks	☑ Yes	☐ No	☑ 1 per day		
Trip Blanks	☑ Yes	☐ No	☑ 1 per ice chest		
Trip Spikes	☐ Yes	☑ No	☐ 1 per ice chest		

Approval and Distribution

Fieldwork Staff Signature _____ Date _____

Project Manager Signature _____ Date _____

Distribution: Project Central File

Prepared for
Department of Defence, Directorate of PFAS Remediation, Environment and Engineering Branch
ABN: 68 706 814 312

AECOM

Sampling Analysis and Quality Plan

25-Sep-2022
PFAS OMP - Robertson Barracks
Doc No. 60612561_OMP_Robertson Barracks_SAQP_201901029

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Delivering a better world

Sampling Analysis and Quality Plan

Client: Department of Defence,
Directorate of PFAS Remediation,
Environment and Engineering Branch

ABN: 68 706 814 312

Prepared by

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Quality Information

Document Sampling Analysis and Quality Plan

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Date 25-Sep-2022

Prepared by [redacted]

Reviewed by [redacted]

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1.0 Introduction

1.1 Preamble

In July 2019, AECOM Australia Pty Ltd (AECOM) was engaged by the Department of Defence (Defence) to implement routine monitoring programs for per- and poly-fluoroalkyl substances (PFAS) over a two-year period at selected Defence sites within the following four Defence regions:

- New South Wales and Jervis Bay Territories (excluding Riverina) Region (NSW & ACT)
- North Queensland Region (North QLD)
- South Queensland Region (South QLD)
- South Australia and Northern Territory Region (SA & NT).

This Sampling Analysis and Quality Plan (SAQP) has been prepared in relation to the proposed Ongoing Monitoring Plan (OMP) (Senversa, 2013) works at the Robertson Barracks (the Site) (**Figure 1, Appendix B**) in the **NT & SA Region**. Robertson Barracks is located approximately 17 km east of the central business district of Darwin, NT. For the purposes of reporting, the “Base” will be in reference to Robertson Barracks, Close Training area (CTA) and Shoal Bay Receiving Station.

1.2 SAQP objectives

The objectives of this SAQP are to:

- Define the proposed scope of works in detail.
- Outline the proposed sampling methodology and procedures to be adopted.
- Outline the proposed quality assurance and quality control (QAQC) measures to be adopted.
- Define the data collection and management requirements for the project.

1.3 Scope of works

To meet the OMP (Senversa, 2023) objectives, the following scope of works are proposed for an approximate two-year monitoring period (September/October 2022 to July 2024) as detailed in the Site OMP (Senversa, 2023). The initial three-year monitoring period (August 2019 to August 2022) is completed.

Table 1 Scope of works (annual schedule)

Sample matrix	Number of sample locations	Laboratory analysis	Frequency	Number of monitoring events	Approximate monitoring period
Groundwater (on-Base and off-Base)	18 monitoring locations	Standard PFAS Laboratory Suite	Biannual	2	End-Wet season (April/May), and end-Dry season (September/October)
Surface water (on-Base and off-Base)	9 monitoring locations	Standard PFAS Laboratory Suite	Biannual	2	Start-Wet season (undertaken as soon as practicable after a first flush rain event; greater than 100mm rainfall, nominally December/January), and end-Wet season (April/May),

2.0 Site Identification

2.1 Site details

Robertson Barracks is located on Thorngate Road, approximately 17 km east of the Central Business District of Darwin, NT. The Barracks are a major training ground for the Australian Defence Force and the home of Australia's 1st Brigade. This facility includes a range of land uses including a helicopter airfield and associated infrastructure in the northern portion with wash bays, refuelling areas, dangerous goods stores and mechanical maintenance areas within various compounds across Robertson Barracks. Ancillary uses include residential housing for personnel, catering kitchens, sports and recreational facilities and a childcare centre.

The area surrounding Robertson Barracks contains predominately semi-rural residential land uses, with open wetland and swamp areas, quarrying areas and The Close Training Area (CTA) located to the east of Robertson Barracks. The CTA was recently acquired by Defence and is currently being developed for the use of live fire range field training.

The Robertson Barracks Management Area (as defined in **Figure 1, Appendix B**) covers 723.4 hectares (ha) (7.23 km^2), comprising:

1. Robertson Barracks.
2. The southern drainage channel (SDC) running along the southern boundary of the Barracks.
3. A portion of the CTA

Two groundwater abstraction bores used for potable purposes at the Shoal Bay Receiving Station (SBRS) have also been included within the OMP (Senversa, 2023) upon request by Defence. The SBRS groundwater abstraction bores are located approximately 5.6 km north of Robertson Barracks.

2.2 Conceptual site model

The Conceptual Site Model (CSM) is presented in the Human Health and Ecological Risk Assessment (HHERA) report (Senversa, 2018a) and the Detailed Site Investigation (DSI) (Senversa, 2018b) which summarises the linkages between sources, exposure pathways and receptors and PFAS extents.

The DSI identified PFAS impacts associated with three source areas at the facility, as follows:

- **Source Area 1**: the former Emergency Response Squadron (ERS) compound within Building 137 and immediate surrounds (Contaminated sites register (CSR) number – CSR_NT_000162).
- **Source Area 2:** 17 Combat Service Support BDE Elements where the ERS parked their trucks prior to moving to Building 137 (CSR number – CSR_NT_000133, CSR_NT_000165 and CSR_NT_000245).
- **Source Area 3:** Wash down bays and refuelling areas within the southern portion of Robertson Barracks. The drainage network also culminates in this area of Robertson Barracks (CSR number – CSR_NT_000241 and CSR_NT_000108).

3.0 Data Quality Assessment

3.1 Data quality objectives

The amended National Environmental Protection Measure (NEPM, Schedule B [2]) Guideline on Site Characterisation (2013) specifies that the nature and quality of the data produced in an investigation will be determined by the Data Quality Objectives (DQOs). As referenced by the NEPM, the DQO process is detailed in the United States Environmental Protection Agency (US EPA) *Guidance on Systematic Planning Using the Data Quality Objectives Process (EPA QA/G-4 : EPA/240/B-06/001), February 2006.*

The US EPA defines the process as *'a strategic planning approach based on the Scientific Method that is used to prepare for a data collection activity. It provides a systematic procedure for defining the criteria that a data collection design should satisfy, including when to collect samples, where to collect samples, the tolerable level of decision errors for the study, and how many samples to collect'.*

The process of establishing appropriate DQOs is defined according to the following seven steps (Table 2):

Table 2 The seven steps in defining DQOs

Step	Data quality objective step
1	***State the problem*** – Define the problem that necessitates the study; identify the planning team, examine budget, schedule.
2	***Identify the goal of the study*** – State how environmental data will be used in meeting objectives and solving the problem, identify study questions, define alternative outcomes.
3	***Identify information inputs*** – Identify data and information needed to answer study questions.
4	***Define the boundaries of the study*** – Specify the target population and characteristics of interest, define spatial and temporal limits, scale of inference.
5	***Develop the analytic approach*** – Define the parameter of interest, specify the type of inference, and develop the logic for drawing conclusions from findings.
6	***Specify performance or acceptance criteria*** – Develop performance criteria for new data being collected or acceptable criteria for existing data being considered for use.
7	***Develop the plan for obtaining data*** – Select the resource-effective sampling and analysis plan that meets the performance criteria.

The approach adopted relative to the seven steps presented above is discussed below.

3.1.1 Step 1 – State the problem

Concentrations of PFAS exceeding adopted screening levels have been detected in groundwater, surface water and sediment within the Management Area including the southern drainage channel and in Milners Creek located outside of Robertson Barracks. These elevated concentrations are not considered to pose a significant risk to human health through recreational direct contact (incidental ingestion/ dermal contact), however are contributing to a potentially elevated risk for ecosystem receptors and the potential consumption of fish and molluscs by humans. Furthermore, the concentration trends in surface water, sediment and groundwater are not well understood based on the available monitoring data.

3.1.2 Step 2 – Identify the goal of the study

The overall goal of the study is to establish a systematic routine groundwater, surface water and sediment sampling and analysis program to provide current and ongoing information on the distribution and concentrations of PFAS in the Management Area.

Specific goals of the program are to:

- understand the changes and trends in the nature, extent and magnitude of PFAS concentrations in the groundwater, surface water and sediment within the Management Area.
- understand if the nature, extent and magnitude of PFAS concentrations has changed significantly to warrant a revision to the human health and environmental risk assessments.
- understand if the nature, extent and magnitude of PFAS concentrations have changed significantly to warrant refinement of any existing management measures.

3.1.3 Step 3 – Identify information inputs

To allow assessment of the data against the study goal listed in Step 2 above, the following inputs will be considered:

- PFAS results from previous environmental investigations
- meteorological data including rainfall
- groundwater, surface water and sediment sample data collected and analysed for PFAS
- groundwater elevation data
- surface water conditions at time of sampling of surface water and sediment
- site status and land use scenarios and whether conditions and uses have changed.
- statistical analysis to identify trends
- advances in laboratory analytical approaches and changes in regulatory requirements.

Key inputs to the decisions also include field observations and measurements, sample collection, preservation, storage, transportation and documentation for each media of concern, analytical methods, field and laboratory QA/QC, validation data obtained from the laboratory analysis.

3.1.4 Step 4 – Define the boundaries of the study

The spatial and temporal boundaries that apply for data collection are detailed below and will influence the decision-making process for ongoing monitoring:

- The spatial boundary for data collection and decision making is limited to the Management Area shown in Figure 1.
- The sampling completed as part of the OMP (Senversa, 2023) will be limited to groundwater, surface water and sediment at the frequencies defined in Section 4.0.
- The monitoring will occur over a further 2 years and the need for ongoing monitoring thereafter will then be considered.

3.1.5 Step 5 – Develop the analytical approach

The data will be used to assess whether PFAS impacts as a result of historical use of Aqueous Film-Forming Foam (AFFF) at Robertson Barracks have changed in nature and extent which may alter the understanding or assessment of identified risks into the future to human or ecological receptors.

The decision rules can be defined as:

- Analytical selection; all samples will be analysed for the extended PFAS suite.
- Analytical method selection for PFAS is based on achieving appropriate laboratory limit of reporting (LOR) in the various media to be analysed.
- Sample locations have been selected with the objective of monitoring PFAS trends (temporal and seasonal), providing early warning of changes in the migration of PFAS in surface water and groundwater.
- If the laboratory quality assurance/quality control data are within the acceptable ranges, the data will be considered suitable for use.

- If PFAS concentrations are reported above the laboratory LOR, where it was previously <LOR, then it will be considered whether further assessment of the data will be required.
- If PFAS concentrations are reported above the drinking water guideline from either of the abstraction bores at SBRS, then assessment of management controls regarding groundwater use in the area should be considered and further risk assessment of potential exposure pathways associated with groundwater use.
- If PFAS is reported at a concentration that is above recreational use guideline in Milners Creek and if access restrictions (fencing) have been ineffective, then re-assess the PMAP management responses to remove the potentially complete pathway.

The decision on the acceptance of the analytical data should be made on the basis of the Data Quality Indicators (DQIs) as follows:

- **Precision:** A quantitative measure of the variability (or reproducibility) of data.
- **Accuracy**: A quantitative measure of the closeness of reported data to the “true” value.
- **Representativeness**: The confidence (expressed qualitatively) that data are representative of each media present on Site.
- **Completeness**: A measure of the amount of useable data from a data collection activity.
- **Comparability**: The confidence (expressed qualitatively) that data may be considered to be equivalent for each sampling and analytical event.

The decisions to be made from investigation results include the following:

3.1.6 Step 6 – Specify performance or acceptance criteria

Specific limits for the works included in the OMP (Senversa, 2023) are in accordance with the appropriate guidance made or endorsed by state and national regulations, appropriate indicators of data quality, and standard procedures for field sampling and handling.

This step also examines the certainty of conclusive statements based on the available new data collected. This should include the following points to quantify tolerable limits:

- A decision can be made based on a certainty assumption of 95% confidence in any given data set. A limit on the decision error will be 5% that a conclusive statement may be a false positive or false negative.
- A decision error in the context of the decision rule presented above would lead to either underestimation or overestimation of the risk level associated with a particular sampling area.
- Sampling errors may occur when the sampling program does not adequately detect the variability of a contaminant from point to point across the site. To address this, alternate locations may be sampled or additional sampling events may be conducted.

  There may be limitations in the data if aspects of the OMP (Senversa, 2023) cannot be implemented, such as:

  - Surface water or groundwater sample locations may be dry at the time of sampling.
  - Groundwater sampling locations are damaged or destroyed and therefore cannot be sampled.
  - Access to some sampling locations could be being restricted due to operational activities or inaccessible due to weather.
- Measurement errors can occur during sample collection, handling, preparation, analysis and data reduction. To address this the following measures are proposed:

  - Collection of sufficient sample mass to facilitate analysis reported to standard laboratory detections limits. Collection of insufficient sample mass may result in raised detection limits.
  - Field staff to follow a standard procedure when collecting samples, including decontamination of tools, and use of appropriate sample containers and preservation methods.

- Laboratories to follow a standard procedure when preparing samples for analysis and undertaking analysis.
- Laboratories to report quality assurance/quality control data for comparison with the DQIs established for the SAQP.

3.1.7 Step 7 – Optimise the design for obtaining data

The methodology presented in this SAQP is designed to meet the Project objectives and to achieve the nominated DQOs. Optimisation of the data collection process will be achieved by:

- Working closely with the analytical laboratories and sampling equipment suppliers to ensure that appropriate procedures and processes are developed and implemented prior to and during the fieldwork, to ensure that sample handling, and transport to and processing by the analytical laboratories is appropriate.
- Conducting sampling according to Defence and Australian Standards for the type of sampling being conducted (i.e. groundwater monitoring well sampling versus landholder bore water sampling). These standards are as follows:
  - Department of Defence (July 2018, Amended August 2019), *Contamination Management Manual*
  - Standards Australia (AS/NZS5667.11–1998) Water Quality – Sampling, part 11: *Guidance on sampling of groundwater*
  - Standards Australia (AS 4482.1-2005) *Guide to the sampling and investigation of potentially contaminated soil. Part 1: Non-volatile and semi-volatile compounds*
  - Standards Australia (AS 4482.2-1999) *Guide to the sampling and investigation of potentially contaminated soil, Part 2: Volatile Substances*.
- Conducting sampling in accordance with AECOM's internal PFAS Sample Collection Guidance.
- Sampling conducted by suitably qualified and experienced field staff.
- Basing the sampling upon a CSM developed using the information available at the implementation of the SAQP. Updating the CSM as new data becomes available in the course of the implementation of the SAQP, as required.
- Progressive review of the data throughout the two-year OMP period and modification of sampling programs to optimise the value of data generated.

If the objectives of the SAQP are not being met, the sampling design and approach will be reviewed and amended, as required.

3.2 Assessment of data quality

The quality of data collected as part of the sampling will be assessed on a range of factors including:

- Documentation and data completeness; and
- Data quality – comparability, representativeness, precision and accuracy of the analytical data.

The project target for data completeness is to achieve 95% of data as suitable for use.

The acceptance criteria for DQIs for samples are specified in Table 3.

Table 3 Acceptance criteria for data quality indicators for sample analysis

Data quality indicators	Acceptance criteria
Water and sediment samples	
Rinsate Blanks (where sampling equipment is reused)	Less than the laboratory LOR.
Field Blanks	Less than the laboratory LOR.

Data quality indicators	Acceptance criteria
Field duplicates/Inter-lab duplicates	The relative percentage differences (RPDs) will be assessed as acceptable if less than or equal to 30% as per the NEPM Schedule B3. Where the results show greater than 30% difference a review of the cause will be conducted (NEPM, 2013). It is noted that RPDs that exceed this range may be considered acceptable where: • Results are less than 10 times the LOR (no limit); • Results are less than 20 times the LOR and the RPD is less than 50%; and • Heterogeneous materials are encountered.
Laboratory duplicates	RPDs less than: • 20% for high level laboratory duplicates (i.e. >20 x LOR); and • 50% for medium level laboratory duplicates (i.e. 10 to 20 x LOR).
Matrix spikes	Recoveries between 70-130% of the theoretical recovery or as nominated in the laboratory's QC report, based on their historical database.
Method blanks	Less than the laboratory LOR.
Laboratory control samples	Recoveries between laboratories specified range for each particular analyte / analytical suite.

4.0 Sampling Location Rationale and Methodology

The OMP (Senversa, 2023) is presented as **Appendix F** of the Robertson Barracks PMAP (Defence, 2019) and identifies the specific inputs required to meet Defence's long-term strategic goals in relation to the management of PFAS contamination at the Site.

The OMP (Senversa, 2023) presents an overview of specific monitoring works to be undertaken and provides the basis for the preparation of this SAQP. This scope of works presented in this SAQP is consistent with that detailed in the OMP (Senversa, 2023), with the exception of those points of deviation presented in Section 4.18.

4.1 Proposed schedule

The key elements of the OMP (Senversa, 2023) are bi-annual monitoring of groundwater and surface water locations, and annual monitoring of sediment. Bi-annual events are to occur at the end of wet season and end of dry season when groundwater and surface water conditions reflect seasonal influences. The annual sediment sampling is to occur in the Wet season when sediment is more likely to be present in drainage lines at Robertson barracks and generally more accessible.

Sample events should be conducted in the following periods:

- Q2 – end of wet season, March/April
- Q4 – end of dry season, September/October

A program schedule is presented in **Appendix A**.

4.2 Access requirements for sampling on Robertson Barracks

4.2.1 Access requirements for sampling on-Base

A range of access requirements exist to gain access to the appropriate areas for the collection of groundwater and surface water samples. Initiating contact with Robertson Barracks no less than two weeks prior to sampling is necessary to ensure all access requirements are satisfied and approved by Base Management as detailed in the Site OMP (Senversa, 2023).

To gain access to Robertson Barracks each field team member must obtain baseline clearance from Defence and receive a Defence Common Access Card (DCAC), which allows unescorted entry to the base. Field team members without baseline clearance and DCAC's will need to be escorted by a field team member that has escort authority associated with their DCAC or have arranged an escort prior to sampling.

To conduct works on the base, Defence Estate and Infrastructure (E&IG) must be contacted to inform them of the intended works and to gain permission prior to carrying those out. As well as grant permission to conduct works, E&IG will alert the dedicated field team of any conflicting works on base. Photo permits must be obtained from E&IG upon arrival at the base, no photos are to be taken before this is done.

If sample locations occur in a construction site, the field team will need to get permission from the project manager to access the site. Any internal inductions for the site will also need to be completed by the team upon the project manager's request.

No. 2 Security Forces Squadron (2SECFOR) is the base security service and will need to be made aware of the works to be carried out and the locations that sampling will occur in.

4.3 Groundwater sample location rationale

There are 18 monitoring wells identified for ongoing monitoring, including on-site and off-site locations (comprising of public land access). The OMP (Senversa, 2023) will monitor groundwater source area concentration changes and changes that may occur at the Base boundary or off-Base locations, which could indicate a change in contaminant transport off-Base. The OMP (Senversa, 2023) will also monitor water supply quality at two groundwater abstraction bores at the SBRS (outside of the Management Area) which are currently used for potable water by Defence.

Table 4 Groundwater sample rationale

Area	Rationale
Robertson Barracks	• Monitoring wells selected target the upper and lower portions of the Bathurst Island Formation • Monitoring wells are located at Source Areas 1, 2 or 3 where PFAS impacts have been identified, up and down gradient of these locations and/or on boundaries, or adjacent to potential surface water drainage features that discharge form the site.
Close Training Area	• Monitoring wells selected target the upper and lower portions of the Bathurst Island Formation. • PFAS impacts in groundwater are yet to have been identified in the CTA to date.
Southern Drainage Channel	• Monitoring wells selected target the upper portions of the Bathurst Island Formation only. • Monitoring wells located adjacent to the southern drainage channel provide an indication of the extent of potential PFAS migration from Robertson Barracks to adjacent land.
Shoal Bay Receiving Station	• Monitor water quality of two groundwater abstraction bores at the SBRS to the north of the Management Area from the Wildman Siltstone Formation, used by Defence to provide potable water.

4.4 Groundwater sampling locations

The groundwater sample locations to be monitored are presented in Table 5 below and on **Figure 2** in **Appendix B**.

Table 5 Groundwater monitoring locations

Area	Description	Sampling location	Aquifer*	Sampling frequency	Number of wells/bores
Robertson Barracks	Source Area 1	MW066	UBIF	Bi-annual (end-Wet season/ end-Dry season)	On-Base (16 locations)
	Up-gradient of Source Area 2	MW080	UBIF		
	Source Area 2	MW004	UBIF		
		MW004D	LBIF		
	Down gradient Source Area 2 and 3	MW001	UBIF		
	Up gradient Source Area 1	MW012	UBIF		
		MW012D	LBIF		
	Northeastern Boundary of site	MW034	UBIF		
Close Training Area	Thorngate Road – Northern Boundary	MW032	UBIF		
	Down gradient Source 1	MW023 (MW024 will be sampled if MW023 is found dry)	UBIF		
		MW021	UBIF		

Area	Description	Sampling location	Aquifer*	Sampling frequency	Number of wells/bores
	Across gradient Source	MW021D	LBIF		
	Down gradient Source 2	MW018 MW031	UBIF		
Shoal Bay Receiving Station	Abstraction bores	MW112 and MW113	WSF		
Southern Drainage Channel (Public Land)	Down gradient of Source Area 2 and 3	MW029 and MW030	UBIF	Bi-annual (end-Wet season/ end-Dry season)	Off-Base (2 locations)

UBIF: Upper Bathurst Island Formation
LBIF: Lower Bathurst Island Formation
WSF: Wildman Siltstone Formation

4.5 Surface water and sediment sampling location rationale

There are 9 locations identified for surface water and sediment sample collection for ongoing monitoring, including on-site in stormwater drains and off-site locations down gradient of the Robertson Barracks at Milners Creek (within the CTA) and SDC (on public land) (Table 6).

Table 6 Surface water and sediment sample rationale

Area	Rationale
Robertson Barracks	• Monitoring to target key source area contributions to drainage system and spatial extent of recorded PFAS concentrations in previous sampling. • Monitoring other areas to target down gradient of main drainage lines.
Close Training Area	• Monitoring locations along Milners Creek either where PFAS impacts have been identified or down-gradient of such locations, including the northern drainage line leading into Milners Creek.
Southern Drainage Channel (Public Land)	• Monitoring location located downstream of surface water flow from southern boundary of Robertson Barracks, where PFAS impacts have been identified. Location also provides an indication of potential PFAS migration from Robertson into the southern tributary of Milners Creek.

4.6 Surface water and sediment sampling locations

The surface water and sediment monitoring locations have been selected to maintain consistency with the monitoring completed during the interim monitoring events and the investigation phases. Many of the locations have been previously sampled several times, and continued monitoring will provide additional data to assess temporal variability. Surface water and sediment sample locations are co-located and are detailed in Table 7 below and presented on **Figure 3** in **Appendix B**.

The locations are to be monitored biannually for surface water (Wet season and Dry season). Unlike surface water, sediment concentrations are not expected to change significantly between the Dry and Wet seasons, however distributions may be expected to change after high flow seasons. Annual monitoring will therefore occur in the Wet season when sediment is more likely to be present in drainage lines at Robertson barracks and generally more accessible.

It is noted that some locations may not have sufficient surface water to sample during the Dry season. Where that is the case such observations at these locations will be recorded. In order to obtain samples during the Wet season, the timing of biannual monitoring may be adjusted or complemented by additional sampling events for locations that are generally dry.

Consideration will also be given to sampling after flooding and/or heavy rainfall events including cyclones, which may mobilise impacts generated from overland flow from source areas. These shall nominally comprise rainfall events of 1 Exceedance per Year (EY) rainfall depth (120 mm) in 24 hours or greater. Sampling shall be undertaken as soon as practicable following the event, ideally within 72 hours.

Table 7 Surface water and sediment sampling locations

Area	Description	Sampling location (surface water / sediment)	Sampling frequency	Number of sampling locations
Robertson Barracks	On-base drainage line, Southeast boundary	SW001 / SD001	Bi-annual (Surface Water) (end-Wet season/ end-Dry season) / Annual (Sediment) (end-Wet season)	On-Base (8 locations)
	On-base drainage line, Southwest boundary	SW007 / SD007		
	On-base drainage line, Central	SW023 / SD023, and SW028 / SD028		
	On-base drainage line, Eastern boundary	SW059 / SD059		
Close Training Area	Northern Drainage Line	SW123 / SD123		
	Milners Creek	SW086 / SD086 and, SW091 / SD091		
Southern Drainage Channel		SW075 / SD075		Off-Base (1 locations)

4.7 Sample collection and handling

4.7.1 Groundwater sampling

The groundwater sampling methodology and schedule are presented in Table 8.

Table 8 Groundwater sampling methodology and schedule

Item	Details	
Groundwater gauging	The depth to groundwater will be measured in each monitoring well prior to collection of groundwater samples. The water level probe shall be decontaminated between sampling locations using Liquinox® and PFAS-free water. Additionally, during the first event a gauging round of all locations will be conducted prior to groundwater sampling to enable groundwater contours to be developed. The depth to groundwater will also be measured at the time of sampling at each location. All gauging shall be completed within a 24-hour period.	
Sample collection methodology	Groundwater Monitoring Wells Groundwater samples will be collected from monitoring wells using no purge methodology with HydraSleeves™ which will be installed within the screened interval of the wells, with the weight sitting one metre above the bottom of the well and secured to the well casing using dedicated disposable string. The HydraSleeves™ will be installed for a minimum of 12 hours prior to sampling for the initial sampling round. Once sampling is completed, new HydraSleeves™ will be deployed in preparation for the next six-monthly sampling round. Abstraction Bores. A new pair of disposable nitrile gloves will be used by sampling personnel at each monitoring well, with gloves disposed of once sampling has been completed at each well. Bore water samples will be collected by placing the laboratory provided sample bottle beneath the tap outlet and the tap slowly opened to collect the “first flush” of water.	
QA/QC samples to be collected	Field QA/QC samples are to include intra-laboratory duplicate (Duplicate) and inter-laboratory duplicate (Triplicate) samples and rinsate samples. Duplicate and triplicate samples are to be collected at a minimum frequency of 1 in 10 PFAS primary samples. Rinsate samples are to be collected at a rate of one sample per day of sampling when non-dedicated equipment is used, by pouring laboratory supplied PFAS free deionised water over the decontaminated sampling equipment. Additional sample volume is required to be collected to enable the appropriate laboratory QAQC. For 1-10 primary samples an additional set of samples for a laboratory duplicate and set of samples for a matrix spike analysis must be taken at two separate sites. For 11-20 primary samples an additional set of samples must be taken at a separate site for another duplicate.	
Field parameters	Temperature, electrical conductivity (EC), dissolved oxygen (DO), oxidation-reduction potential (ORP), pH and observations of water quality will be recorded for all samples.	
Sample analysis	All primary samples will be submitted for PFAS extended (or ‘Full’) suite using the standard levels of detection.	
Sampling schedule	As per Appendix A.	
Minimum sampling volumes	Bottle	Minimum Volume
	PFAS Bottle (Grey)	20mL

4.7.2 Surface Water Sampling

The surface water sampling methodology and schedule are presented in Table 9.

Table 9 Surface Water Sampling Methodology and Schedule

Item	Details
Sample collection methodology	Samples are to be collected, using a telescopic sampling pole with laboratory supplied bottle on the end, from approximately 0.5 m below the surface (if possible), with care to minimise collection of sediment or floating materials in the samples. The sampling pole will be stainless steel to ensure that it does not contain PFAS. At each location, a new, laboratory supplied container should be lowered into the water using a sampling pole, with the cap immediately applied once the container is full. A new pair of disposable nitrile gloves will be used by sampling personnel at each sampling site, with gloves disposed of once sampling has been completed at each site. Following sample collection, field parameters will be recorded in-situ by placing the water-meter probe in the surface water collection location
QA/QC samples to be collected	Field QA/QC samples are to include intra-laboratory duplicate (Duplicate) and inter-laboratory duplicate (Triplicate) samples and rinsate samples. Duplicate and triplicate samples are to be collected at a minimum frequency of 1 in 10 PFAS primary samples. Rinsate samples are to be collected at a rate of one sample per day of sampling when non-dedicated equipment is used by pouring laboratory supplied PFAS free deionised water over the decontaminated sampling equipment. Additional sample volume is required to be collected to enable the appropriate laboratory QAQC.
Field parameters	Temperature, EC, DO, ORP, pH and observations of water quality will be recorded for all samples. Observations on the water body will also be recorded, such as size, flow rate and type of water body.
sample analysis	All primary samples will be submitted for PFAS extended suite using the standard levels of detection.
Sampling schedule	As per Appendix A.

4.7.3 Sediment sampling

The sediment sampling methodology and schedule are presented in Table 10.

Table 10 Sediment sampling methodology and schedule

Item	Details
Sample collection methodology	Samples to be collected from the sediment/water interface (0.0 to 0.1 mbgl), where practicable. A grab sample will be collected utilising a laboratory-supplied HDPE-free soil jar lowered into the water body using a stainless-steel sampling pole and nitrile gloves. Sediment will be collected directly into the jars until sampling jar capacity is met. Jar lids will be secured immediately upon completion of filling each jar. Alternatively, a grab sample can be collected wearing fresh disposable nitrile gloves or using a hand trowel or shovel, decontaminated with laboratory supplied PFAS-free water and Liquinox® solution after each use.
QA/QC samples to be collected	Field QA/QC samples are to include intra-laboratory duplicate and inter-laboratory duplicate samples (i.e. splits), field blanks and rinsate samples.
Soil logging	The sediment will be logged in accordance with the Unified Soil Classification System (USCS) and AS1726:2017.
Sample analysis	All primary samples will be submitted for PFAS extended suite using the standard levels of detection.

Item	Details
Sampling schedule	As per Appendix A.

4.7.4 Sample handling and transport to laboratory

AECOM personnel will attempt to reduce heterogeneity in the sample media matrix by dividing the sample collected between primary and inter/intra-laboratory collection jars or bottles during sampling. All samples will be placed on ice in eskies immediately after sampling.

All samples will be kept, if possible, at approximately 4°C during transit to the laboratory. Samples will be transported directly to the laboratory for analytical testing under standard Chain of Custody (CoC) procedures. Primary and field QA/QC samples will be analysed by Australian Laboratory Services (ALS) (Sidney, NSW), a National Association of Testing Authorities (NATA) accredited laboratory. The inter-laboratory duplicate samples will be analysed by National Measurement Institute (NMI) (North Ryde, NSW), also a NATA accredited laboratory.

Prior to sampling, assessment of the analytical holding times will be made, and the sampling planned accordingly to ensure that holding times are not breached or minimised.

4.8 Calibration

The water quality meter will be calibrated prior to field mobilisation for field activities with relevant solutions, including pH, EC and ORP. The calibration will be in accordance with manufacturers' instructions or NATA publication "General Requirements for Registration: Supplementary Requirement: Chemical Testing (NATA 1993) and Technical Note No. 19 (NATA 1994)". Where satisfactory calibration cannot be achieved, the water quality data will not be used for interpretive purposes.

Calibration details will be recorded on a calibration record sheet and included in the Sampling Events Factual Reports.

4.9 Logistics

The laboratory sample containers will be shipped from the laboratory to the AECOM office in Darwin prior to the commencement of fieldwork. All primary samples will be transported by an ALS supplied courier at the completion of fieldwork. All inter-laboratory duplicate samples will be transported with the primary samples, then separated and couriered directly to the secondary laboratory (NMI, Sydney) by ALS under a separate CoC for analysis.

4.10 Analytical suite and laboratory analysis methods

4.10.1 Laboratory NATA accreditation details

Laboratory Sampling analysis is to be conducted using NATA certified laboratories which will implement a quality control plan in accordance with NEPM (2013).

4.10.2 Analytical schedule

All media sampled shall be analysed for the extended PFAS suite with standard LOR as outlined in Table 11 below.

Table 11 Sample analytical suite for PFAS

PFAS group	Compound	CAS No.
Perfluoroalkyl Sulfonic Acids	Perfluorobutane sulfonic acid (PFBS)	375-73-5
	Perfluoropentane sulfonic acid (PFPeS)	2706-91-4
	Perfluorohexane sulfonic acid (PFHxS)	355-46-4
	Perfluoroheptane sulfonic acid (PFHpS)	375-92-8
	Perfluorooctane sulfonic acid (PFOS)	1763-23-1

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

The current standard laboratory limits of reporting (LOR) are described in Table 12 below.

Table 12 Laboratory limits of reporting

Sample media	Parameter	Technique/method reference	LOR
Groundwater and surface water	Extended PFAS suite	LC/MS-MS	0.01 – 0.1 µg/L

LC/MS-MS = Liquid chromatography–mass spectrometry
LOR for Australian Laboratory Services (ALS)

4.11 Sample nomenclature

In order to meet Defence data management requirements presented in **Section 4.0** of **Annex L** of the **Defence Contamination Management Manual** (**DCMM**) (Department of Defence, 2018), a consistent sample nomenclature has been adopted for the program. All samples collected from each location should have a unique identification. The minimum mandatory requirements for the sample identifications are outlined in Table 13, further examples relevant to this SAQP are outlined in Table 14.

Table 13 Mandatory requirements for Defence sample nomenclature

Sample ID	Location ID
PPPP_XX000_ZZZ_YYMMDD	XX000
e.g. 1200_BH001_1.2_190207	e.g. BH001
Reference	
PPP – property identification (4-digits) XX – type of sample recovery 000 – location specific identification ZZZ – indicates the depth that the sample has been collected (in meters below ground level [bgl] YYMMDD – date of sample collection	

Table 14 Sample abbreviations

Abbreviation	Meaning	Matrix	Examples of methods of sampling	Example sample name/comments
MW	Monitoring well	Water	Groundwater	1200_MW104_180630 Aquifer details can also be added following the location ID if required, where; P – perched, S – shallow, I – intermediate, and; D – deep
SW	Surface water	Water	Surface water	1200_SW002_180630

4.11.1 Quality assurance / quality control sample nomenclature

The naming convention for QA/QC samples are outlined in Table 15 below.

Table 15 QA/QC sample naming convention

QA/QC sample type	Naming convention (where XX is a sequential number independent of sample or matrix type)
Quality control duplicate samples	
Intra-laboratory duplicate (duplicate)	1200_QC1XX_YYMMDD
Inter-laboratory duplicate (triplicate)	1200_QC2XX_YYMMDD
Quality assurance samples	
Rinsate	1200_QC3XX_YYMMDD
Field Blank	1200_QC4XX_YYMMDD
Trip Blank	1200_QC5XX_YYMMDD

4.12 Defence ESdat requirements

Defence has contracted Earth Science Information Systems (EScIS), to provide contamination data management services through a cloud instance of its ESdat product.

All OMP field and laboratory data collected by AECOM will be uploaded, stored and managed in Defence's ESdat database in accordance with Section 6 of Annex L to the Defence Contamination Management Manual. AECOM will refer to historical investigation data to ensure consistent location codes are used to enable analysis of data trends. Where required under Annex L, non-compliant location codes will be resolved under direction from Defence.

AECOM will upload the data from each monitoring event into ESdat prior to submitting the Sampling Event Factual Report.

4.13 Adopted screening criteria

PFAS screening values have been adopted for groundwater and surface water from the Defence OMP (Senversa, 2023) and are derived from the following documents:

- HEPA (2020) PFAS National Environmental Management Plan 2.0 (NEMP)
- Department of Health (DoH), 2019. Health Based Guidance Values for PFAS for use in site investigations in Australia. September 2019 (DOH 2019)
- National Health and Medical Research Council (NHMRC), 2019. Guidance on PFAS in Recreational Water. August 2019 (NHMRC 2019)
- National Environment Protection (Assessment of Site Contamination) Measure 1999, Schedule B1, as amended in 2013 (ASC NEPM)

Adopted PFAS screening values are provided in Table 16.

Table 16 Adopted PFAS screening values for all media (µg/L)

Pathway	Compound	Criteria	Comment / reference
Drinking water - groundwater	PFHxS+PFOS	0.07 µg/L	The values presented in the PFAS NEMP 2020 (HEPA, 2020) are from DoH 2017, which published final health-based guidance values for PFAS for use in site investigations in Australia. DoH utilised the TDI for PFOS and PFOA from FSANZ, 2017 and the methodology described in Chapter 6.3.3 of the National Health and Medical Research Council's (NHMRC) Australian Drinking Water Guidelines (ADWG), 2016 to determine drinking water values. For PFHxS, DoH 2017 noted that '*FSANZ concluded that there was not enough toxicological and epidemiological information to justify establishing a tolerable daily intake. However, as a precaution, and for the purposes of site investigations, the PFOS tolerable daily intake should apply to PFHxS. In practice, this means that the level of PFHxS exposure should be added to the level of PFOS exposure; and this combined level be compared to the tolerable daily intake for PFOS*'. *All groundwater results will be compared to these criteria.*
	PFOA	0.56 µg/L	

Pathway	Compound	Criteria	Comment / reference
Recreational use – surface water	PFHxS+PFOS	2 µg/L	The values presented in the PFAS NEMP 2020 (HEPA, 2020) were based on NHMRC guidance on the assessment of PFAS in surface water, released in 2019. Rather than adopting an ingestion rate of 0.2 L of water per day (as per the ADWG formula), NHMRC adjusted this rate with consideration of an event frequency (150 events / year) to calculate an annual ingestion rate of 30 L per year. *All surface water results will be compared to these criteria.*
	PFOA	10 µg/L	

Table 17 PFAS criteria summary: Ecological

Media	Pathway	Chemical	Criteria	Comment/Reference
Water	Freshwater	PFOS	0.00023 µg/L	HEPA (2020) NEMP 99% species protection
		PFOA	19 µg/L	

Note: HEPA (2020) notes that the 99% species protection level for PFOS is close to the level of detection. Agencies may wish to apply a 'detect' threshold in such circumstances rather than a quantified measurement. For the purposes of this plan, a 'detect' threshold has not been applied.

4.14 Waste management

Due to the proposed "no purge" sampling methodology, it is not anticipated that significant volumes of liquid waste would be generated that would require management or disposal.

Single use sampling equipment and any waste generated during works (including generation of wastewater or soil) will be managed and/or disposed of appropriately in accordance with Territory waste disposal requirements.

4.15 Quality assurance/quality control sampling

The recommendations within this document are based on the guidelines presented in:

- NEPM [the National Environment Protection (Assessment of Site Contamination) Measure 1999] as amended in 2013
- AS4482.1 Guide to the sampling and investigation of potentially contaminated soil, Part 1: Non-Volatile and Semi-Volatile Substances
- AS4482.2 Guide to the sampling and investigation of potentially contaminated soil, Part 2: Volatile Substances
- AS/NZ 5667.1 Water Quality Sampling – Guidance on the design of sampling programs, sampling techniques and the preservation and handing of samples
- ANZECC&ARMCANZ (2000). Australian guidelines for water quality monitoring and reporting
- ANZECC& ARMCANZ (2000). Australian and New Zealand guidelines for fresh and marine water quality
- WA DER (2016). Interim Guideline on the Assessment and Management of Perfluoroalkyl and Polyfluoroalkyl Substances (PFAS)
- United States Environmental Protection Agency (US EPA) (2000) Guidance on Systematic Planning Using the Data Quality Objectives Process EPA QA/G-4

4.15.1 Field intra-laboratory duplicate and inter-laboratory duplicate samples

Intra-laboratory and inter-laboratory field duplicates will be collected at a frequency of one per ten samples for each environmental media that are collected (10%). Repeatability will be assessed by

relative percentage difference (RPD) between primary and duplicate samples. If RPD has variability greater than 30% the sample will be reviewed. The minimum volume of duplicate and inter-duplicate samples are to follow the below requirements set by the primary and secondary laboratories.

4.15.2 Rinsate samples

Rinsate samples will be prepared in the field using laboratory prepared bottles and PFAS free deionised water used for the cleaning of 'reusable sampling equipment' (if used). These will be collected at a frequency of one per day or for each 10 primary samples where more than ten samples are collected in a day, where reusable sampling equipment has been used.

4.15.3 Field blank samples

The Field Blank sample will be prepared in a clean environment (office or warehouse) and remain with the sample containers during sampling and during return to the lab.

4.15.4 Trip blank samples

The Trip Blank samples will be prepared in a clean environment (office or warehouse) and remain with the sample containers during sampling and during return to the lab.

4.15.5 Additional PFAS samples

Additional sample volumes will be obtained to enable laboratory QA/QC (duplicates and matrix spike) for PFAS analysis. The frequency of additional samples is 2:10 and 3:20, where two additional sets (2x20mL) are required per 10 primary samples, or three sets per 20 primary samples.

4.16 Fieldwork documentation

4.16.1 Field observations and results

Field notes will be maintained to record all field sampling events and include observations made at each sample location. Field notes will include information specific to the sample media as follows:

- Groundwater Samples – comments on the observed characteristics of the sample (e.g. colour, turbidity, odour, sheen) and reported field water quality parameters (pH, EC, DO, ORP, temperature) will be recorded at regular intervals
- Surface Water Samples – comments on the observed characteristics of the sample (e.g. colour, turbidity, odour, sheen), field water quality parameters (pH, EC, DO, ORP, temperature), and sampling location description (e.g. stream width, stream depth, flow direction) will be recorded
- Sediment Samples – comments on the observed characteristics of the sample (e.g. colour, turbidity, odour, sheen) and logged in accordance with the Unified Soil Classification System (USCS) and AS1726:2017.

The geo-coordinates for each sample location will be noted. The location of quality control (e.g. duplicate and inter-laboratory duplicate) sample collection points will also be noted.

AECOM's tablet-based Environmental Data Collection and Analysis ('EDCA') tool will be utilized by field staff to capture consistent field data based on project specific requirements, minimise potential data transcription errors, allow on-the-spot identification of potentially erroneous data in comparison to historical data and facilitate efficient data transfer to multiple data systems including ESdat.

4.16.2 Sample labels

Sample containers will be labelled, as a minimum, with the following information:

- AECOM project number
- Name of sampler
- Sample ID
- Date of sample collection
- Filtered vs non-filtered (for water samples only).

An indelible felt pen will be used for labelling, to ensure that the lettering is not erased during transit to the laboratory.

AECOM will utilize the tablet based EDCA tool to streamline sample labelling and chain of custody (CoC) creation to ensure compliant sample IDs are used in the field.

4.16.3 Chain of custody forms

A CoC form will be completed, documenting the sample identification number and analytes. The CoC documents the chain of events from sample collection to delivery at the laboratory and provides a traceable account of sample handling. The CoC form will be signed by both the sample collector and the receiving laboratory.

The CoC form will include the following information:

- Job number (Note: the name of the site is not identified for confidentiality purposes)
- Date and time of sample collection
- Sample ID
- Type of containers
- Name of sampler
- Laboratory to be used
- Analyses required
- Any comments
- Signatures of the sampler and laboratory receiver.

In the event that additional samples are collected during the field investigations due to observations made by the field team, (i.e. samples not proposed in this SAQP), Defence will be provided the rationale for collection of those samples and proposed laboratory analyses. Defence approval will be sought to include these samples on the CoC and to dispatch these samples to the laboratory.

Upon receipt of the original documents accompanying the samples at the laboratory, the laboratory will provide a sample receipt document (noting the temperature of samples upon receipt, analyses required and any non-conformances) and return the signed CoC form to confirm analyses to be performed and the due date for the analytical results.

4.16.4 Sampling documentation

Field sampling sheets will be completed for each location, and will include the following information (as appropriate for the media being sampled):

- Name of sampler
- Sample location
- Date /time of monitoring/ sampling
- Sampling method
- Observations of the sampled media
- Calibration records.

Records of all equipment calibration will be included in the Sampling Event Factual Reports.

4.17 Reporting

4.17.1 Sampling event factual report

No later than four weeks following the completion of each sampling event, AECOM will prepare and submit a Sampling Event Factual Report to Defence. A sampling event is defined as all sampling activities occurring in association with a PMAP defined season (i.e. end of dry / start of wet season),

which can include groundwater, surface water, and / or sediment sampling occurring at different times throughout a specified season as is appropriate for each sampling type. Each Sampling Event Factual Report will include:

- details of the scope of monitoring completed
- a description of the sampling methodologies used
- a summary of observations made while sampling (e.g. any visual or olfactory observations that may indicate impacts to surface water or groundwater)
- a summary of any changes to the monitoring network condition that may affect data integrity, or require rectification works, and recommendations for repair, replacement of decommissioning of a location
- a presentation of the analysis results in a table that includes comparisons with PFAS guidelines, highlighting any significant statistical deviations from historical monitoring and investigation data
- a presentation of the reduced groundwater levels for the event on a figure with inferred contours and inferred groundwater flow direction
- discussion of the analytical data quality, including review of the quality control sampling results and laboratory quality control data
- inclusion of the following information as attachments:
    - Figures
    - Tables
    - Sampling logs and forms including field water quality parameter measurements
    - Chain of custody forms
    - Laboratory analytical certificates and QAQC reports
    - Equipment calibration certificates

4.17.2 Annual monitoring and management report

At the end of each 12-month monitoring period, AECOM will prepare and submit an Annual Interpretive Report to Defence. Each Interpretive Report will include:

- evidence of compliance with the requirements of the SAQP and meeting stated objectives of the OMP (Senversa, 2023)
- relevant figures depicting sampling locations and site-specific hydrogeological features
- laboratory results and analysis including comparison with relevant screening criteria as identified in each OMP (Senversa, 2023)
- assessment and commentary on appropriate QA/QC procedures
- a review of the Conceptual Site Model and provision of a revised Conceptual Site Model if required
- data interpretation, including trends in groundwater concentration, gradient and flow directions
- assessment of statistically based trends that may inform decision making when it comes to the revision of an OMP (Senversa, 2023)
- a statement as to whether the risk profile has changed overall, or for any specific location at the Site, and a recommendation as to whether this should trigger an OMP and/or PMAP review, or other action.

4.17.3 OMP review

Review of ongoing management at the site for the release to the government and public stakeholders. The report should contain the following information:

- Identification of improvements to the OMP (Senversa, 2023) procedures in light of observed variability or concentration changes
- Review of data gaps and nomination of measures to address significant gaps
- Review of Changes in Australian or international practice and guidance in PFAS investigation
- Reporting of changed conditions that require mitigation or warrant review of risk assessments

4.18 Deviations from OMP

While the scope of works and methodology described in this SAQP are generally consistent with that presented in the OMP (Senversa, 2018a), a number of points of deviation are noted (refer to Table 18 below).

Table 18 Deviations from OMP

No.	Description	Rationale
1	Adoption of Revised Recreational Screening Criteria for PFHxS+PFOS and PFOA	Following the release of the OMP (Senversa, 2023) in July 2019, the National Health and Medical Research Council (NHMRC), published guidance on PFAS in Recreational Water. The adopted screening criteria for PFHxS+PFOS and PFOA in surface water have therefore been revised to 2 µg/L and 10 µg/L, respectively. This is reflected in **Section 4.13.**
2	Sampling of groundwater and surface water for the non-PFAS suite.	Defence notified the AECOM project management team via email on 27th January 2021 that "*all future OMP sampling events across all sites, the inclusion of non-PFAS analysis will need to be justified in advance and agreed by Defence Tech Policy through review of the SAQP*".
3	Inclusion of MW024 as a contingency well for MW023.	Monitoring location MW023 has been found dry during several monitoring events. MW024 is located downgradient of MW023 in an area more likely to have water availability during dry season sampling events and can serve as a downgradient sentinel well when MW023 cannot be sampled.
4	Well ID Changes: • ROBMW01 to MW034 • ROBMW07 to MW080 • 103MW02 to MW066 • SBRS1 (OSP002_Bore1) to MW112 • SBRS (OSP002_Bore 2) to MW113	The naming changes were conducted to ensure that the well IDs are DCMM compliant.

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Appendix A

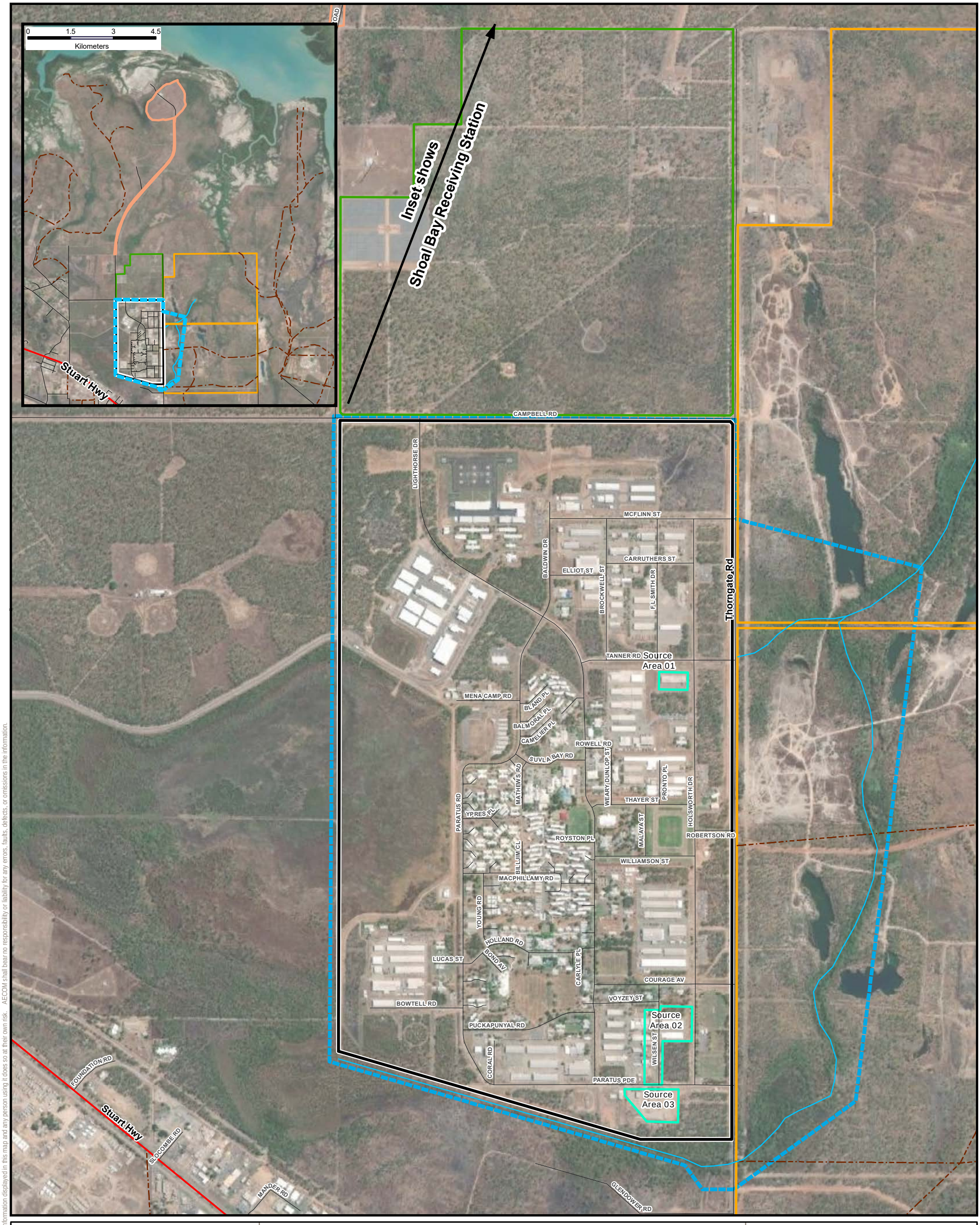
Schedule

D R A F T

			Wet Season					Dry Season						
			Q4/Q1		Q2			Early		Mid			Late	
			Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Robertson Barracks	Fieldwork	Groundwater				Biannual On-Base / Off-Base					Biannual On-Base / Off-Base			
		Surface Water	End of wet season Off-base / On-Base			End of wet season Off-Base / On-Base								End of wet season Off-base / On-Base
		Sediment				End of wet season Off-Base / On-Base								

Appendix B

Figures



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N

DATUM GDA 1994, PROJECTION MGA ZONE 52

0 125 250 500
metres

1:14,000 (when printed at A3)

LEGEND

- Monitoring
- Source

Site Layout

- Robertson Barracks
- Close Training
- Marksmanship Training Range
- SBRS Facility
- Watercourse
- Highway
- Road
- Track

Data sources:
Base data NT Gov 2019
GW data AECOM 2019

Department of Defence
Robertson Barracks
Sampling and Analysis Quality Plan 2021
PFAS Management Area

PROJECT ID	60612561
CREATED BY	[redacted]
LAST MODIFIED	[redacted] 23 JUN 2021
VERSION:	1

Figure
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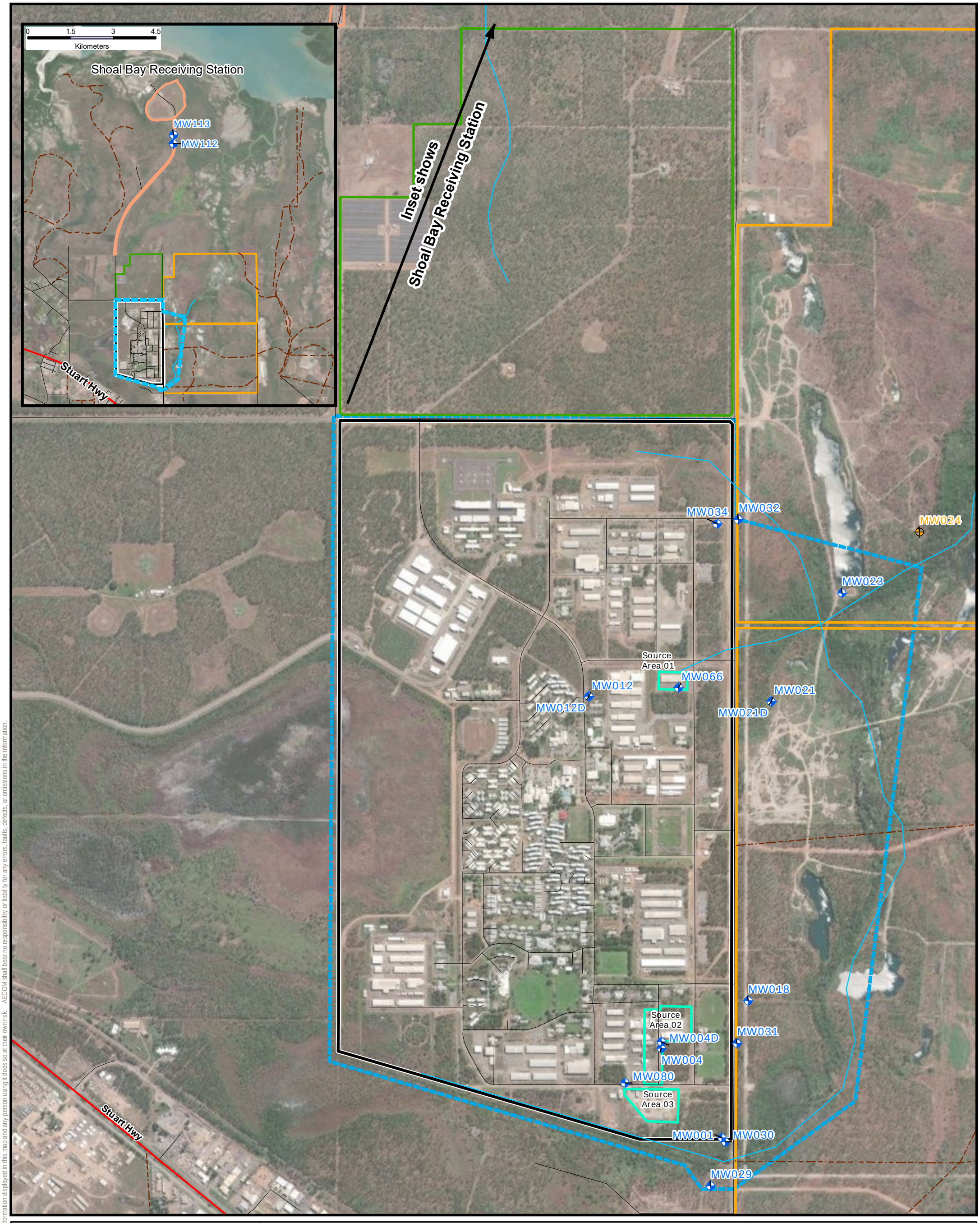

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LEGEND

- Groundwater Monitoring Locations
- Contingency Locations
- Monitoring
- Source

Site Layout

- Robertson Barracks
- Close Training
- Marksmanship Training Range
- SBRS Facility

- Watercourse
- Highway
- Road
- Track

Data sources:
Base data NT Gov 2019
GW data AECOM 2019

Department of Defence
Robertson Barracks
Sampling and Analysis Quality Plan 2021
On-Base and Off-Base Groundwater Monitoring Locations

PROJECT ID	60612561
CREATED BY	[redacted]
LAST MODIFIED	[redacted] 27 OCT 2021
VERSION:	1

Figure
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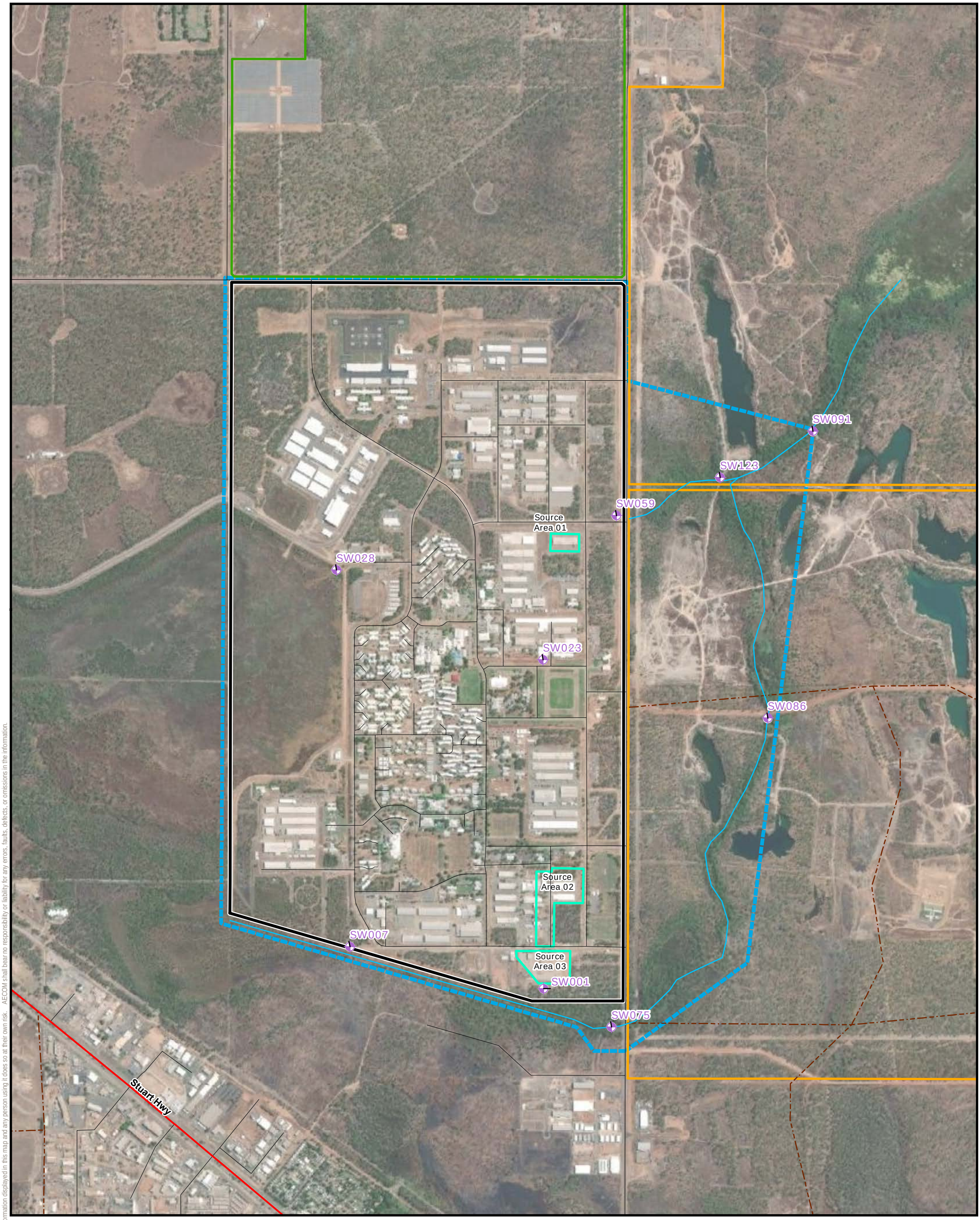

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LEGEND

- Surface Water Locations
- Monitoring Area
- Source Area

Site Layout

- Robertson Barracks
- Close Training Area
- Marksmanship Training Range
- Watercourse
- Highway
- Road
- Track

Data sources:
Base data NT Gov 2019
GW data AECOM 2019

Department of Defence
Robertson Barracks
Sampling and Analysis Quality Plan 2021
On-Base and Off-Base Surface Water Monitoring Locations

PROJECT ID	60612561
CREATED BY	[redacted]
LAST MODIFIED	[redacted] 23 JUN 2021
VERSION:	1

Figure
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A3 size

Appendix C

Monitoring Location Tables

Table C-1 Robertson Barracks groundwater monitoring locations

Well ID	Legacy Well ID	Location	Target Aquifer	Well Cover Type	Easting	Northing	Top of Casing (mAHD)	Existing Surface (mAHD	Total Well Depth (mBTOC)	Total Well Depth (mBGL)	Casing Height (m)	Screen Level (mBGL)	Well Condition
MW066	103MW02	Robertson Barracks	Upper Bathurst Island Formation	Flush	715327.9	8624669.41	23.19	NK	12	12	0	1.5 to 12.0	Good
MW034	ROBMW01	Robertson Barracks	Upper Bathurst Island Formation	Stickup	715486.43	8625341.737	19.5	NK	12	12	0	1.0 to 12.0	Good - blockage reported at 6.1 mBTOC in May 2018
MW080	ROBMW07	Robertson Barracks	Upper Bathurst Island Formation	Stickup	715108.06	8623047.02	26.56	NK	17	17	0	2.5 to 17.0	Good
MW001		Robertson Barracks	Upper Bathurst Island Formation	Stickup	715505.57	8622822.33	24.37	23.71	7.05	7.05	0.66	1.5 to 7.5	Good
MW004		Robertson Barracks	Upper Bathurst Island Formation	Stickup	715256.6	8623189.56	26.78	26.05	8	8	0.73	2.0 to 8.0	Good
MW004D		Robertson Barracks	Lower Bathurst Island Formation	Stickup	715256.78	8626187.99	26.78	26.05	30.07	30.07	0.73	27.0 to 30.0	Good
MW012		Robertson Barracks	Upper Bathurst Island Formation	Stickup	714958.53	8624633.44	30.65	30.06	10.08	10.08	0.59	2.0 to 10.0	Good
MW012D		Robertson Barracks	Lower Bathurst Island Formation	Stickup	714959.9	8624632.46	30.77	30.06	30.19	30.19	0.71	27.0 to 30.0	Good
MW018		CTA	Upper Bathurst Island Formation	Stickup	715613.47	8623385.67	25.57	24.9	8.04	8.04	0.67	2.0 to 8.0	Good
MW021		CTA	Upper Bathurst Island Formation	Stickup	715707.15	8624613.08	18.03	17.3	7.99	7.99	0.73	2.0 to 8.0	Good
MW021D		CTA	Lower Bathurst Island Formation	Stickup	715707.09	8624611.41	17.99	17.3	30.13	30.13	0.69	27.0 to 30.0	Good
MW023		CTA	Upper Bathurst Island Formation	Stickup	715998.31	8625057.75	12.16	11.5	6.09	6.09	0.66	2.0 to 6.0	Good
MW024 Alternate for MW023 if dry		CTA	Upper Bathurst Island Formation	Stickup	716315.87	8625307.30	6.34	5.68	8.760	8.100	0.660	2.0 to 8.0	Good
MW029		Southern drainage channel	Upper Bathurst Island Formation	Stickup	715459.14	8622625.725	25.436	24.732	5.31	5.31	0.704	1.5 to 7.5	Good
MW030		Southern drainage channel	Upper Bathurst Island Formation	Stickup	715519.142	8622806.908	23.33	23.997	8.17	8.17	-0.667	1.5 to 7.5	Good
MW031		CTA	Upper Bathurst Island Formation	Stickup	715567.947	8623210.939	25.558	24.895	7.96	7.96	0.663	1.5 to 7.5	Good
MW032		CTA	Upper Bathurst Island Formation	Stickup	715572.273	8625358.983	19.862	19.173	8.14	8.14	0.689	2.0 to 8.0	Good
MW112	SBRS1 (OSP002_Bore1)	SBRS	Wildman Siltstone Formation	Bore tap	715965.27	8631539.21	NK	NK	NK	NK	NK	NK*	Good
MW113	SBRS (OSP002_Bore 2)	SBRS	Wildman Siltstone Formation	Bore tap	715966.18	8631539.2	NK	NK	NK	NK	NK	NK*	Good

NK – Not Known
* Publicly available records indicate one bore was installed with a screen interval between 36.8 and 50.5 mbgl with another screened between 48.0 and 57.0 mbgl

Table C-1 Robertson Barracks surface water and sediment monitoring locations

Surface Water Location ID	Sediment Location ID	Location	Area	Eastings (MGA)	Northings (MGA)
SW001	SD001	Robertson Barracks	Southeast	715217.25	8622868.93
SW007	SD007	Robertson Barracks	Southwest	714423.5	8623039.32
SW023	SD023	Robertson Barracks	Central	715215.13	8624216.19
SW028	SD028	Robertson Barracks	Central	714368.42	8624585.32
SW059	SD059	Robertson Barracks	Eastern boundary	715516.28	8624807.52
SW075	SD075	SDC	South of site	715496.6473	8622710.176
SW086	SW086	CTA	East of RB	716137.44	8623977.7
SW091	SD091	CTA	East of RB	716322.07	8625153.71
SW123	SD123	CTA	East of RB	715941.22	8624964.44

Prepared for
Department of Defence Directorate of PFAS Remediation Environment and Engineering Branch
ABN: 68706814312

AECOM

Sampling Event Factual Report, Dry Season 2023

PFASOMP Robertson Barracks

21-Mar-2024
PFAS Ongoing Monitoring Plan

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Sampling Event Factual Report, Dry Season 2023

PFASOMP Robertson Barracks

Client: Department of Defence Directorate of PFAS Remediation Environment and Engineering Branch

ABN: 68706814312

Prepared by

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21-Mar-2024

Job No.: 60612561

AECOM in Australia and New Zealand is certified to ISO9001, ISO14001 and ISO45001.

Quality Information

Document Sampling Event Factual Report, Dry Season 2023

Date 21-Mar-2024

Originator [redacted]

Verifier/s [redacted]

Revision History

Rev	Revision Date	Details	Approved	
			Name/Position	Signature
0	21-Mar-2024	Final	[redacted]	[redacted]

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Abbreviations

Term	Description
AECOM	AECOM Australia Pty Ltd
ALS	ALS Environmental Pty Ltd
ASC NEPM	National Environment Protection Council 1999, National Environment Protection (Assessment of Site Contamination) Measure, Amendment 1 2013
DCMM	Defence Contamination Management Manual
DO	Dissolved oxygen
EC	Electrical conductivity
HEPA	Heads of Environmental Protection Agencies
LOR	Limit of reporting
NATA	National Association of Testing Authorities
NEMP 2.0	National Environmental Management Plan
NHMRC	National Health and Medical Research Council
NMI	National Measurement Institute
NT	Northern Territory
NTU	Nephelometric Turbidity Unit
NSW	New South Wales
OMP	Ongoing Monitoring Program
ORP	Oxidation-reduction potential
PFAS	Per- and poly-fluoroalkyl substances
PFHxS	Perfluorohexane sulfonic
PFOA	Perfluorooctanoic acid
PFOS	Perfluorooctane sulfonate
PMAP	PFAS Management Area Plan
QA/QC	Quality Assurance/Quality Control
SAQP	Sampling Analysis Quality Plan
SWL	Standing Water Level

List of Units

Unit	Definition	Unit	Definition
^{o}C	degrees Celsius	mg	milligrams
cm	centimetre	mV	millivolts
L	litre	µg	micrograms
m	metre	µS	microSiemens
mAHD	metres Australian Height Datum	NTU	Nephelometric Turbidity Unit
mbTOC	metres below top of casing	mbgl	metres below ground level

1.0 Introduction

1.1 General

AECOM Australia Pty Ltd (AECOM) was engaged by the Department of Defence (Defence) to implement the per- and poly-fluoroalkyl substances (PFAS) Ongoing Monitoring Plan (OMP) outlined in the PFAS Management Area Plan (PMAP) (Department of Defence, 2018a) at Robertson Barracks (the 'Base') in the Northern Territory. The location of the Base and Management Area is shown in Figure 1 in Appendix A. The OMP (Department of Defence, 2023) for the Base outlines the requirement to complete groundwater and surface water sampling biannually.

The primary purpose of the OMP is to monitor changes to the PFAS impact in groundwater and surface water pathways associated with sources of PFAS as initially assessed through the detailed site investigation phase of works. Changes may result from the specific or cumulative impact of remediation or containment actions, existing transportation trends, and changes to hydrogeology or weather events.

The monitoring plan at Robertson Barracks includes a regime of groundwater and surface water sampling to capture these changes in the long term, to enable Defence to maintain an up-to-date understanding of temporal and spatial distribution, concentration and transport of PFAS contaminants.

This report details the scope and findings of the dry season monitoring which included groundwater sampling conducted in October 2023.

1.2 Objectives

As noted above, the objective of the PFAS OMP (Department of Defence, 2023) is to provide information on changes to PFAS contamination originating from Defence property to inform risk management decisions by Defence to protect human health and the environment.

The purpose of this PFAS OMP factual report is to summarise the scope of works and findings for the October 2023 groundwater sampling event, conducted in accordance with the Sampling and Analysis Quality Plan (SAQP) (AECOM, 2023).

This report has been prepared in accordance with the Defence PFAS OMP factual reports – interim guidance for preparation, v2, May 2021 (Department of Defence, 2021).

An ongoing monitoring report will be subsequently developed for the purpose of assessing the data collected during the discrete monitoring events completed over the preceding 12-month period and will include assessment of environmental variability and any statistically significant trends in PFAS concentrations.

2.0 Scope of Work

The sampling event was completed in general accordance with the SAQP (AECOM, 2023). Prior to commencement of the sampling event, the SAQP (AECOM, 2023), was reviewed to ensure compliance with the following:

- PFAS National Environmental Management Plan (NEMP 2.0) (HEPA, 2020)
- National Environment Protection (Assessment of Site Contamination) Measure 1999 (ASC NEPM, 2013)
- Defence OMP (Department of Defence, 2023)
- Defence Routine Environment Water Quality Monitoring Manual (Department of Defence, 2019a)
- AS/NZ 5667:1998 Water quality – Sampling (AS/NZS, 1998)
- Water Quality Guidelines (ANZG, 2018); and
- Relevant Territory regulatory guidelines.

In summary, the scope of works for this sampling event, conducted in October 2023, included:

- Collection of 15 groundwater samples (including gauging of groundwater levels, where appropriate) from existing monitoring wells using HydraSleeves™ (refer to **Table 1** below, and Figure 1 in Appendix A, for specific locations).
- Collection of two groundwater samples via extraction bores at Shoal Bay Receiving Station (Refer to **Table 1** below and Figure 1 Appendix A, for specific locations)
- Collection of intra- and inter-laboratory duplicate samples at a rate of 1 in 10 primary samples, one rinsate, one field blank sample per sampling day and one trip blank per cooler per event.
- Analysis of all samples for a suite of 28 PFAS analytes at the standard limit of reporting (LOR).
- Data management of the OMP field and laboratory data in the Defence ESdat database
- Preparation of this Sampling Event Factual Report.

2.1 Planned monitoring locations

The monitoring locations outlined within the relevant SAQP (AECOM, 2023) for the groundwater sampling event are tabulated below. Deviations from the planned sampling are highlighted in bold and detailed in Section 2.2 below.

Table 1 Groundwater sampling locations

Area	Description	Sampling Locations	Number of wells/ bores	Total
On-Base	North-eastern Boundary of Base	MW034	1	8
	Source Area 1	MW066	1	
	Source Area 2	**MW004**[+], MW004D	2	
	Up gradient Source Area 1	MW012, MW012D	2	
	Up gradient Source Area 2	MW080	1	

Area	Description	Sampling Locations	Number of wells/ bores	Total
	Cross-gradient of source areas 2 and 3	MW001	1	
Off-Base	Thorngate Road – Northern Boundary	MW032	1	10
	Down gradient Source 1	**MW023***	1	
	Across gradient Source 1	MW021, MW021D	2	
	Down gradient Source 2 and 3	MW018, MW031	2	
	Cross-gradient of Source Area 2 and 3	MW029, MW030	2	
	Shoal Bay Receiving Station (SBRS) – extraction bores	MW112^, MW113^	2	

+ Not sampled due to root impaction.

* Contingency location MW024 sampled in lieu as primary sample well MW023 was dry

^ Extraction bores and therefore not able to collect gauging data.

2.2 Deviations from the SAQP

The works completed during this sampling event included deviations from the SAQP (AECOM, 2023) outlined below in **Table 2** below.

Table 2 Deviations from the SAQP

SAQP requirement	October 2023 sampling event	Impact to OMP
Sampling of all OMP groundwater locations.	Monitoring location MW004 was not sampled due to root growth preventing deployment of HydraSleeve™. No alternate location was available for this location during this sampling event.	Minor impact - The lack of data from MW004 has a minor impact on the understanding of concentration changes within the source area. Location has previously been able to be sampled during the wet season when roots are inundated. During the wet season, attempts to unblock the roots will be made otherwise consideration for replacement of an alternative well will be made.
	Monitoring location MW023 was dry and not able to be sampled. Monitoring location MW024 was sampled in-lieu of MW023.	No impact - The alternative well, MW024, is considered suitable to provide coverage for the assessment of PFAS impacts in the area. The

SAQP requirement	October 2023 sampling event	Impact to OMP
		overall dataset is not considered to have been impacted by this change.
Water quality parameter collection for groundwater.	The water quality parameter data at location MW030 was lost due to electronic data collection fault, where the data was not saved and could not be retrieved.	Minor impact - The lack of water quality parameter data is not considered to have an impact on PFAS concentrations at this location.

3.0 Sampling Methodology

The methodology adopted for the biannual groundwater sampling event in October 2023 was in accordance with the SAQP (AECOM, 2023) and is summarised below:

Table 3 Groundwater sampling methodology

Item	Details
Groundwater gauging	Where accessible, the depth to groundwater was measured in each monitoring well within a 24-hour period, and then again immediately prior to collection of groundwater samples using an interface probe. Refer to **Section 4.0** and Appendix B – Table T1 for gauging and water quality parameters results.
Water quality parameters	Groundwater water quality parameters were recorded ex-situ, using a YSI Pro Water Quality Meter. Parameters recorded consisted of the following: temperature (°C), electrical conductivity (EC), dissolved oxygen (DO), oxidation-reduction potential (ORP) and pH. Observations of odour, colour and clarity (turbidity) of groundwater was recorded at each location. Refer to Appendix C for calibration records of the YSI Pro Water Quality Meter.
Water sampling methodology	Groundwater samples were collected from all accessible wells using no-purge methodology HydraSleeves™, which were installed within the screened interval of the wells for a minimum of 24 hours prior to sampling. HydraSleeve™ placement was based on a review of the well construction logs. Once sampling was completed, new HydraSleeves™ were redeployed within the screened interval in preparation for the next sampling round. Two extraction bores, MW112 and MW113, were sampled by grab sample from the headwork's tap and therefore no data was able to be collected.
Sample analysis	Samples were submitted to the primary and secondary laboratories for analysis. ALS Environmental (ALS) Sydney, New South Wales (NSW) was used as the primary laboratory. The National Measurement Institute (NMI) of Sydney, NSW was used as the secondary laboratory. ALS and NMI methods for analyses were certified by the National Association of Testing Authorities (NATA). Laboratory certificates are presented in Appendix D.
QA/QC samples	Field QA/QC samples collected included intra- and inter-laboratory duplicates at a rate of one in 10 primary samples, rinsate and field blank samples at a rate of one per day of sampling and trip blank samples at a rate of one per esky. A validation assessment of the data has been completed and is presented in Appendix E.

3.1 Adopted Screening Criteria

The adopted screening criteria references the PFAS National Environmental Management Plan 2.0 (NEMP 2.0) (HEPA, 2020) Defence estate and environmental strategies, and Defence PFAS-specific strategies and guidance. At the time of preparing this report, the primary guidance document utilised is the PFAS National Environmental Management Plan (version 2.0) (NEMP) (HEPA, 2020).

The PFAS screening criteria adopted to assess the data generated from the monitoring are presented in

Table 4 and **Table 5**. These screening criteria included values for the following analytes:

- Perfluorooctane sulfonate (PFOS)
- Sum of Perfluorooctane sulfonate and Perfluorohexane sulfonate (PFOS+PFHxS)
- Perfluorooctanoic acid (PFOA).

Table 4 Summary of adopted water screening criteria: human health

Pathway	Compound	Criteria	Comment / Reference
Drinking water - groundwater	PFOS + PFHxS	0.07 micrograms per litre (µg/L)	The values presented in the PFAS NEMP 2. (HEPA, 2020).
	PFOA	0.56 µg/L	*All groundwater results were compared to these criteria.*

Table 5 Summary of adopted water screening criteria: ecological

Media	Compound	Criteria	Comment/Reference
Freshwater (99% species protection values) – groundwater	PFOS	0.00023 µg/L	These values are from the PFAS NEMP 2.0 (HEPA, 2020). The 99% level of protection has been applied for slightly to moderately disturbed ecosystems. This approach is generally adopted for chemicals that bioaccumulate and biomagnify in wildlife. For the purposes of preliminary screening of analytical water results, the laboratory LOR will be adopted rather than sole use of the criteria value. *All groundwater results were compared to these criteria.*
	PFOA	19 µg/L	

Notes: HEPA (2020) notes that the 99% species protection level for PFOS is close to the level of detection. Agencies may wish to apply a 'detect' threshold in such circumstances rather than a quantified measurement. The laboratory PFOS limit of reporting (LOR) adopted in this report is 0.001 µg/L.

3.2 Data quality objectives and data validation

The data quality objectives and data quality indicators adopted for these works are presented in the SAQP (AECOM, 2023). Data validation assessment is provided in Appendix E.

The key finding from the data validation was as follows:

- The potential exists for concentrations of PFOS to be below the LOR (0.01 µg/L), but above the PFAS Freshwater 99% Species Protection guideline (0.00023 µg/L) in samples MW012, MW012D, MW018, MW021, MW021D, MW024, MW029, MW031, MW112, MW113. This should be taken into consideration when interpreting results.

Data validation procedures employed in the assessment of the field and laboratory QA/QC data are indicative that the overall quality of the analytical data produced is acceptably reliable for the purpose of this report. An examination of sampling analysis data compared to the data validation findings did not result in any results that required flagging for potential inaccuracies.

All data collected during this event has been reviewed and uploaded to the Defence ESdat database in accordance with Defence Contamination Management Manual (DCMM) (Department of Defence, 2019b) Annex L requirements.

4.0 Field observations and results

4.1 General Field Observations

The following field observations were applicable across the entirety of the October 2023 sampling event. Table 6 General Field Observations

Item	Observation
Weather conditions (October 2023)	Weather in general was observed to be hot, 32.6 – 36.2 °C, with high humidity throughout the monitoring event period (65-86 %). 0 mm of rainfall was recorded at the nearest rain gauging station (Knuckeys Lagoon) on the sampling field dates of 5 and 9 October.
Estate Management Works or Training Activities	During the sampling event, no notable estate works, or training activities were observed in the vicinity of sampling locations. Base activities are not expected to have a material impact on sampling results.

4.2 Groundwater

4.2.1 Field observations and field measurements

Field data was collected electronically on tablets and uploaded into ESdat for development of report tables. Field results are presented in Appendix B – Table T1 and summarised in **Table 7** below.

Table 7 Groundwater observations and field measurements

Item	Observations and field measurements
Fieldwork Dates	The sampling event was completed between 5 and 9 October 2023.
Access and Sample Collection	All monitoring wells and bores were accessible and sampled with the exception of MW004 and MW023: • MW004 was observed to be blocked, likely by tree roots. A HydraSleeve™ was not able to be deployed beyond the blockage at this location, hence the well was unable to be sampled. • MW023 was observed to be dry; contingency well MW024 was sampled in lieu of MW023. Monitoring wells MW112 and MW113 are extraction bores and samples were collected from the fitted taps. No standing water levels (SWL) were recorded for these locations.
Monitoring Well Network Condition	The monitoring well network was generally in good condition with the exception of MW004, which was observed to be blocked, likely by tree roots.
Field Observations	Suspected root impaction was noted at monitoring well MW004. Moderate turbidity was observed in samples collected from monitoring locations MW012, MW024, MW029, MW031, MW032, MW034.

Item	Observations and field measurements
Depth to Groundwater and flow direction	Depth to groundwater was recorded from 15 of 17 wells visited (all other than the two wells sampled via taps, and MW004 which was blocked), ranging from 2.322 (MW024) to 8.541 (MW012D and MW021D) metres below top of casing (mbTOC). Groundwater elevations were between 1.56 (MW024) and 23.360 (MW012) metres Australian Height Datum (mAHD). Groundwater gauging data is presented in Appendix B – Table T1. Inferred groundwater contours and groundwater flow directions at the site in October are shown in Appendix A - Figure 2. Inferred groundwater contouring suggests that groundwater in the shallow aquifer unit drains east and northeast towards Millner's Creek.
Water Quality parameters	Groundwater water quality parameters were measured during sample collection from the HydraSleeve™ (or from the grab samples obtained from the taps) using a decontaminated YSI cup and YSI Pro Water Quality Meter. The readings are presented in Appendix B - Table T1 and are summarised below: • DO ranged from 1.32 milligrams per litre (mg/L) (MW018) to 6.37 mg/L (MW113). • EC ranged from 24.8 microsiemens per centimetre (µS/cm) (MW012) to 15,838 µS/cm (MW024); all wells other than MW024 reported EC values below 400 µS/cm indicating a generally low salinity; MW024 is located within the Close Training Area, downgradient of Robertson Barracks, and the higher salinity in this well is reflective of its location. • pH ranged from 3.65 (MW066) to 6.7 (MW112) pH units indicating acidic to neutral conditions. • Corrected redox ranged from 104.2 millivolts (mV) (MW004D) to 466.0 mV (MW021) indicating oxidising to reducing conditions.

4.2.2 PFAS groundwater analytical results

During this sampling event, seven of the 17 groundwater locations sampled reported concentrations of PFAS above the laboratory limits of reporting (LOR).

There was one first time detection of PFOS above the limit of reporting at MW004D.

The PFAS groundwater analytical results from the October 2023 sampling event are summarised below in Table 8 and presented in Appendix B – Table T2.

Table 8 First time detections of PFAS and exceedances of guidelines in groundwater

Type	Location ID	Sum of PFHxS + PFOS concentration (µg/L)		PFOA concentration (µg/L)		PFOS concentration (µg/L)	
		October 2023	Historical maximum	October 2023	Historical maximum	October 2023	Historical maximum
First time detections of Sum of PFHxS + PFOS, PFOS or PFOA in groundwater.	MW004D.	0.01	<LOR	<LOR	<LOR	0.01	<LOR
New exceedance of human health criteria for sum of PFHxS + PFOS or PFOA in groundwater	There were no new exceedances of human health criteria in groundwater during this sampling event.						

Type	Location ID	Sum of PFHxS + PFOS concentration (µg/L)		PFOA concentration (µg/L)		PFOS concentration (µg/L)	
		October 2023	Historical maximum	October 2023	Historical maximum	October 2023	Historical maximum
New exceedance of ecological criteria for PFOS or PFOA in groundwater.	MW004D.	0.01	<LOR	<LOR	<LOR	0.01	<LOR

5.0 Summary of next sampling events

5.1 Summary of monitoring event

The end of dry season groundwater monitoring event was completed at the Base and publicly accessible land within the Management Area between 5 and 9 October 2023. All proposed groundwater monitoring wells were sampled other than MW004 (blocked) and MW023 (dry); contingency well MW024 was sampled in lieu of MW023.

The findings of the October 2023 sampling event and the recommended actions are summarised in Table 9 below.

Table 9 Summary of Sampling Event

Item	Comment	Recommended Actions
Access to sampling locations	Monitoring well MW023 was dry during this event. Monitoring well MW004 was blocked preventing sampling.	Contingency monitoring well MW024 utilised in lieu of MW023. Monitoring well MW004 should be examined for potential root removal and/or repairs.
Analytical Results	PFAS concentrations were recorded above the LOR at seven of 17 monitoring well locations sampled.	No actions recommended. Ongoing monitoring in accordance with the OMP.
New exceedance of NEMP 2.0 drinking water and ecological guideline values in groundwater	A new exceedance of the NEMP 2.0 ecological guideline value for PFHxS+PFOS and PFOS was recorded at MW004D (0.01 µg/L).	MW004D analytical results were confirmed via reanalysis. Resampling of MW004D will occur during the start of wet season surface water sampling event to confirm results and be reported in the Wet Season Factual Report. It should be noted that the result is at the LOR and below the drinking water guideline value for sum of PFHxS and PFOS.
First-time detections of PFAS in groundwater	A first-time detection above the LOR for PFHxS+PFOS and PFOS was recorded at MW004D (0.01 µg/L).	MW004D analytical results were confirmed via reanalysis. Resampling of MW004D will occur during the start of wet season surface water sampling event to confirm results and be reported in the Wet Season Factual Report. It should be noted that the result is at the LOR and below the drinking water guideline value.
New exceedance of NEMP 2.0 drinking water and ecological guideline values at extraction bores at SBRS Facility	There were no new exceedances of PFHxS+PFOS, PFOS and PFOA guideline values in groundwater collected from extraction bores from the SBRS facility during the October 2023 sampling event.	Ongoing monitoring in accordance with the OMP.

5.2 Upcoming Sampling Events

Wet season surface water sampling will take place during the early part of the wet season, likely December 2023 to January 2024, then again during the late wet season in March to April 2024.

The next groundwater sampling event is scheduled for April 2024.

5.3 Upcoming Ongoing Monitoring Report

The fifth ongoing monitoring report is scheduled to be delivered in the second half of 2024.

6.0 References

AECOM, 2023. *Sampling Analysis and Quality Plan - Robertson Barracks Revision 3,* Darwin: AECOM.

ANZG, 2018. *ANZG (Australian and New Zealand Governments) 2018. Australian and New Zealand Guidelines for Fresh and Marine Water Quality. Australian and New Zealand Governments and Australian state and territory governments, Canberra ACT, Australia,* s.l.: s.n.

AS/NZS, 1998. *Water quality - Sampling - Guidance on the design of sampling programs, sampling techniques and the preservation and handling of samples,* s.l.: s.n.

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Department of Defence, 2019a. *Pollution Prevention Guideline: Routine Water Quality Monitoring Manual,* s.l.: s.n.

Department of Defence, 2019b. *Contamination Management Manual,* s.l.: s.n.

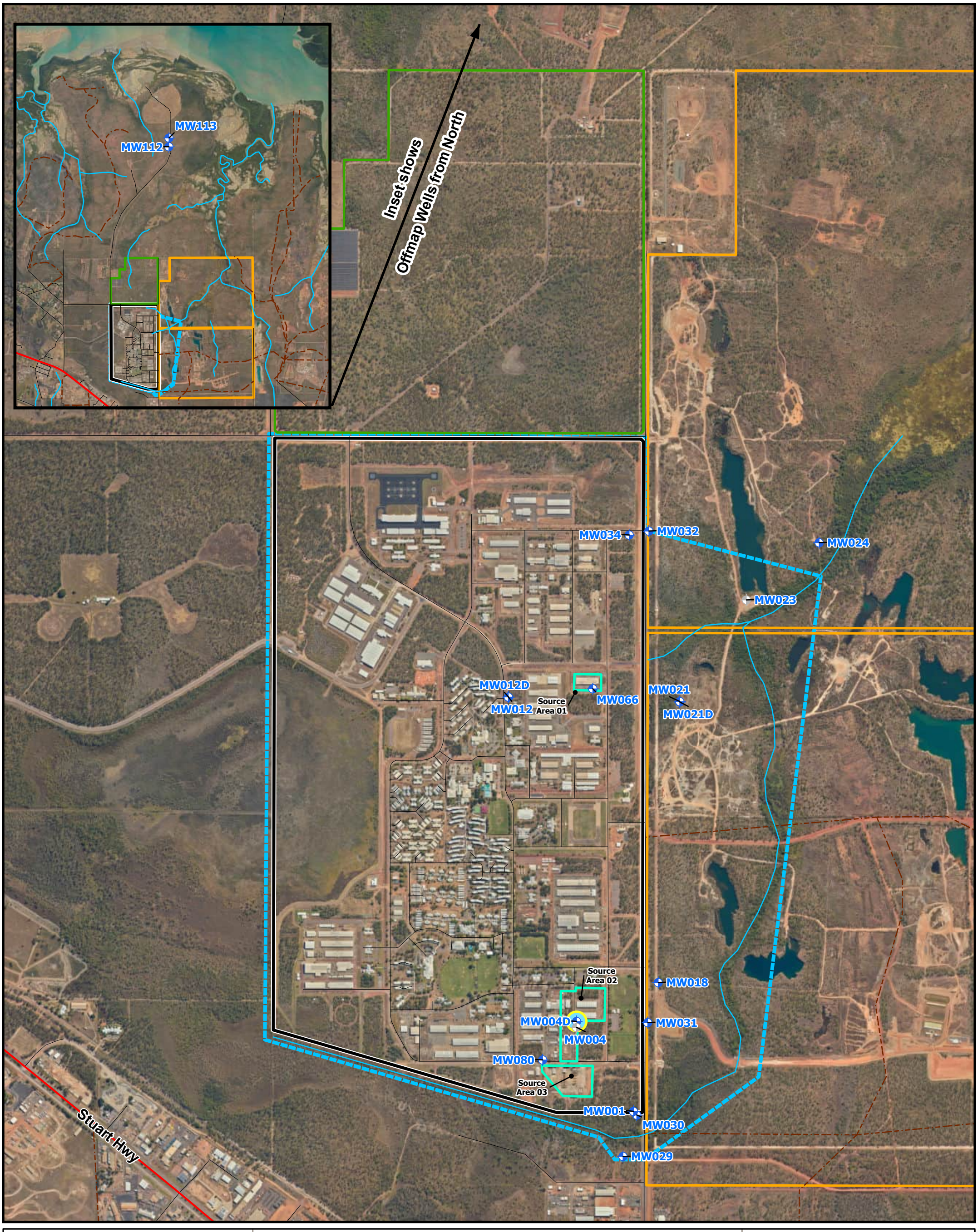
Department of Defence, 2021. *Defence PFAS OMP factual reports – interim guidance for preparation, v0.2,* s.l.: s.n.

Department of Defence, 2023. *PFAS Ongoing Monitoring Plan, Version 1, 15 February 2023.* s.l.:s.n.

HEPA, 2020. *PFAS National Environmental Management Plan 2.0. January 2020,* s.l.: s.n.

Appendix A

Figures



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DATUM GDA 1994, PROJECTION MGA ZONE 52

0 100 200 400 600 800

metres

1:15,000 (when printed at A3)

LEGEND

- Groundwater Monitoring Locations
- Dry/Damaged/Blocked Locations
- Denotes first time detection above LOR for Sum of PFHxS+PFOS or PFOA
- Denotes new exceedance of human health or ecological screening criteria
- Monitoring Area
- Source Area

Site Layout

- Robertson Barracks
- Close Training Area
- Marksmanship Training Range
- Watercourse
- Highway
- Road
- Track

Note:
MW024 sampled as contingency location for MW023

Data sources:
Base data NT Gov 2022
GW data AECOM 2022

Department of Defence
ROBERTSON BARRACKS
PFAS ONGOING MONITORING PROGRAM
END OF DRY SEASON REPORT 2023

Groundwater Sampling Locations

PROJECT ID	60612561
CREATED BY	[redacted]
LAST MODIFIED	[redacted] - 23 NOV 2023
VERSION:	1

Figure
1

A3 size

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DATUM GDA 1994, PROJECTION MGA ZONE 52

0 50 100 200 300 400

metres

1:10,000 (when printed at A3)

LEGEND

- Dry/Damaged/Blocked Locations
- Groundwater Monitoring Locations
- 75.44 Inferred Groundwater Level (mAHD)
- Inferred Groundwater Level
- Inferred Flow Direction
- Monitoring Area
- Source Area

Site Layout

- Robertson Barracks
- Close Training Area
- Marksmanship Training Range
- Watercourse
- Road
- Track

Note:
- MW030, MW034, MW066, MW004D, MW012D and MW21D not included in contouring.
- Millner Creek to the south of the Base influences nearby groundwater flow direction, however overall groundwater flow direction is to the north-east.

Data sources:
Base data NT Gov 2022
GW data AECOM 2022

Department of Defence
ROBERTSON BARRACKS
PFAS ONGOING MONITORING PROGRAM
END OF DRY SEASON REPORT 2023

Groundwater Contours

PROJECT ID	60612561
CREATED BY	[redacted]
LAST MODIFIED	[redacted] 13 FEB 2024
VERSION:	1

Figure
2

Filename: \\na.aecomnet.com\LFS\APAC\Darwin-AUDWN1\Legacy\Projects\606x\60612561\900_CAD_GIS\920_GIS\60612561_Darwin_Def\02_MXDs\RobertsonBarracks\04_2023_PFAS_EDSR\G60612561_RobertsonBarracks_01_2023_PFAS_EDSR.aprx Layout: 60612561_04_002

A3 size

Appendix B

Tables

Table T1
Groundwater Field Results
PFAS Ongoing Monitoring Plan
Department of Defence - Robertson Barracks

October - Groundwater Field Results

AECOM

	Gauging Results						Field Parameters											
Location ID	**Date**	**Depth to Water (mbTOC)**	**Well Depth (mbTOC)**	**TOC (mAHD)**	**Water Elevation (mAHD)**	**Condition of Gatic**	**Date**	**DO (mg/L)**	**EC (µS/cm)**	**TDS (calc) (mg/L)**	**pH**	**Redox (mV)**	**Redox (corr)(mV)**	**Temp (°C)**	**Turbidity (Visual)**	**Water Colour**	**Odour**	**Sheen**	**Sample Method**
MW001	5/10/2023	2.714	7.88	24.37	21.66	Good	9/10/2023	2.73	34.8	20.9	4.72	165.5	365.5	28.9	Low	Light brown	Odourless	No sheen	Hydrasleeve
MW004	5/10/2023	-	-	-	-	mpacted with roots	9/10/2023	Root impaction - unable to sample											
MW004D	5/10/2023	5.246	31.10	26.78	21.53	Good	9/10/2023	1.50	316.2	189.7	6.39	-95.8	104.2	29.2	Low	Light brown	Odourless	No sheen	Hydrasleeve
MW012	5/10/2023	7.288	23.55	30.65	23.36	Good	9/10/2023	1.93	24.8	14.9	4.56	174.1	374.1	31.1	Moderate	Light brown	Odourless	No sheen	Hydrasleeve
MW012D	5/10/2023	8.541	NM	30.77	22.23	Good	9/10/2023	2.25	27.6	16.6	4.79	154.6	354.6	31.8	Low	Light brown	Odourless	No sheen	Hydrasleeve
MW018	6/10/2023	4.172	8.73	25.57	21.40	Good	6/10/2023	1.32	74.1	44.5	4.80	103.4	303.4	30.5	Low	Light brown	Odourless	No sheen	Hydrasleeve
MW021	6/10/2023	2.676	NM	18.03	18.03	Good	6/10/2023	1.46	35.7	21.4	4.34	266.0	466.0	29.2	Low	Light brown	Odourless	No sheen	Hydrasleeve
MW021D	6/10/2023	8.541	30.62	17.99	9.45	Good	6/10/2023	2.68	146.0	87.6	5.55	187.3	387.3	30	Low	Light brown	Odourless	No sheen	Hydrasleeve
MW023	6/10/2023	-	-	-	-	Good	6/10/2023	Sampling location dry - unable to sample											
MW024^	6/10/2023	2.322	6.86	3.88	1.56	Good	6/10/2023	1.54	15838	9502.8	6.05	69.8	269.8	631.3	Moderate	Brown	Odourless	No sheen	Hydrasleeve
MW029	5/10/2023	3.543	7.54	25.436	21.89	Good	9/10/2023	1.34	42.5	25.5	4.84	113.7	313.7	31.4	Moderate	Light brown	Odourless	No sheen	Hydrasleeve
MW030	5/10/2023	3.305	7.03	23.33	20.03	Good	9/10/2023	Field parameters and observations not saved - electronic data error											Hydrasleeve
MW031	5/10/2023	3.988	7.67	25.558	21.57	Good	9/10/2023	1.86	32.2	19.3	3.87	188.4	388.4	30.9	Moderate	Pale brown	Odourless	No sheen	Hydrasleeve
MW032	5/10/2023	5.344	8.66	19.862	14.52	Good	9/10/2023	2.56	85.3	51.2	5.44	94.2	294.2	29.2	Moderate	Light brown	Odourless	No sheen	Hydrasleeve
MW034	5/10/2023	6.648	11.80	19.5	12.85	Good	9/10/2023	2.22	124.3	74.6	5.69	24.7	224.7	5.65	Moderate	Pale brown	Odourless	No sheen	Hydrasleeve
MW066	5/10/2023	5.919	11.94	23.19	17.27	Good	9/10/2023	1.99	42.6	25.6	3.65	229.1	429.1	31.3	Low	Colourless	Odourless	No sheen	Hydrasleeve
MW080	5/10/2023	4.655	12.99	26.6	21.95	Good	9/10/2023	3.39	89.4	53.6	5.27	45.4	245.4	29.8	Low	Pale brown	Odourless	No sheen	Hydrasleeve
MW112	5/10/2023	Did not measure due to tapped well					9/10/2023	5.08	248.2	148.9	6.7	81.3	281.3	28.7	Low	Colourless	Odourless	No sheen	Tap
MW113	5/10/2023	Did not measure due to tapped well					9/10/2023	6.37	304.7	182.8	6.45	67.6	267.6	29.6	Low	Colourless	Odourless	No sheen	Tap

Notes:
^MW024 - contingency well for MW023
mbTOC: metres below top of casing
mAHD: metres Australia Height Datum
NM: not measured
mg/L: milligram per Litre
µS/cm: microsiemens per centimetre
mV: millivolts
°C: degrees celcius

Table T2
Groundwater Analytical Results
PFAS Ongoing Monitoring Plan
Department of Defence - Robertson Barracks Surrounds

Groundwater Analytical Results

AECOM

					PFAS Full Suite																														
					10:2 Fluorotelomer sulfonic acid (10:2 FTS)	4:2 Fluorotelomer sulfonic acid (4:2 FTS)	6:2 Fluorotelomer Sulfonate (6:2 FtS)	8:2 Fluorotelomer sulfonic acid (8:2 FTS)	N-Ethyl perfluorooctane sulfonamide (EtFOSA)	N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	N-Methyl perfluorooctane sulfonamide (MeFOSA)	N-Methyl perfluorooctane sulfonamidoacetic acid (MFOSAA)	N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	Perfluorobutane sulfonic acid (PFBS)	Perfluorobutanoic acid (PFBA)	Perfluorodecanesulfonic acid (PFDS)	Perfluorodecanoic acid (PFDA)	Perfluorododecanoic acid (PFDoDA)	Perfluoroheptane sulfonic acid (PFHpS)	Perfluoroheptanoic acid (PFHpA)	Perfluorohexanoic acid (PFHxA)	Perfluorononanoic acid (PFNA)	Perfluorooctane sulfonamide (FOSA)	Perfluoropentane sulfonic acid (PFPeS)	Perfluoropentanoic acid (PFPeA)	Perfluorotetradecanoic acid (PFTeDA)	Perfluorotridecanoic acid (PFTrDA)	Perfluoroundecanoic acid (PFUnDA)	Sum of PFAS	Sum of PFHxS and PFOS	Perfluorooctane sulfonic acid (PFOS)	Perfluorooctanoic Acid (PFOA)	Perfluorohexane sulfonic acid (PFHxS)
					µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
				LOR	0.05	0.05	0.05	0.05	0.05	0.02	0.05	0.05	0.02	0.05	0.02	0.1	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.05	0.02	0.02	0.01	0.01	0.01	0.01	0.01	0.01
PFAS NEMP 2020 Drinking Water																														**0.07**		**0.56**			
PFAS NEMP 2020 Freshwater 99% Species Protection																															0.00023	19			
Location	**Field ID**	**Date**	**Lab Report**	**Sample Type**																															
MW001	1200_MW001_231009	9/10/2023	ES2334612	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	0.13	**0.13**	0.09	<0.01	0.04
MW001	1200_QC100_231009	9/10/2023	ES2334612	Intra-lab Duplicate	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	0.14	**0.14**	0.1	<0.01	0.04
MW001	1200_QC200_231009	9/10/2023	RN1408243	Inter-lab Duplicate	<0.01	<0.01	<0.01	<0.01	<0.02	<0.01	<0.05	<0.02	<0.01	<0.05	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.02	<0.02	<0.02	<0.01	0.055	0.055	0.026	<0.01	0.029
MW004D	1200_MW004D_231009	9/10/2023	ES2334612	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	0.01	0.01	0.01	<0.01	<0.01
MW012	1200_MW012_231009	9/10/2023	ES2334612	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	<0.01	<0.01	<0.01*	<0.01	<0.01
MW012D	1200_MW012D_231009	9/10/2023	ES2334612	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	<0.01	<0.01	<0.01*	<0.01	<0.01
MW018	1200_MW018_231006	6/10/2023	ES2334612	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	<0.01	<0.01	<0.01*	<0.01	<0.01
MW021	1200_MW021_231006	6/10/2023	ES2334612	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	<0.01	<0.01	<0.01*	<0.01	<0.01
MW021D	1200_MW021D_231006	6/10/2023	ES2334612	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	<0.01	<0.01	<0.01*	<0.01	<0.01
MW024^	1200_MW024_231006	6/10/2023	ES2334612	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	<0.01	<0.01	<0.01*	<0.01	<0.01
MW029	1200_MW029_231009	9/10/2023	ES2334612	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	<0.01	<0.01	<0.01*	<0.01	<0.01
MW030	1200_MW030_2310	9/10/2023	ES2334612	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	0.11	**0.11**	0.08	<0.01	0.03
MW031	1200_MW031_231009	9/10/2023	ES2334612	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	<0.01	<0.01	<0.01*	<0.01	<0.01
MW032	1200_MW032_231009	9/10/2023	ES2334612	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	0.06	0.06	0.04	<0.01	0.02
MW034	1200_MW034_231009	9/10/2023	ES2334612	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	0.04	<0.02	<0.02	<0.02	0.04	<0.05	<0.02	<0.02	0.21	**0.13**	0.1	<0.01	0.03
MW034	1200_QC101_231009	9/10/2023	ES2334612	Intra-lab Duplicate	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	0.04	<0.02	<0.02	<0.02	0.04	<0.05	<0.02	<0.02	0.23	**0.15**	0.12	<0.01	0.03
MW034	1200_QC201_231009	9/10/2023	RN1408243	Inter-lab Duplicate	<0.01	<0.01	<0.01	<0.01	<0.02	<0.01	<0.05	<0.02	<0.01	<0.05	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	0.015	<0.01	<0.01	<0.01	0.021	<0.02	<0.02	<0.01	0.087	0.051	0.035	<0.01	0.016
MW066	1200_MW066_231009	9/10/2023	ES2334612	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	0.03	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	0.5	**0.45**	0.36	0.02	0.09
MW080	1200_MW080_231009	9/10/2023	ES2334612	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	0.02	0.02	0.02	<0.01	<0.01
MW112	1200_MW112_231009	9/10/2023	ES2334612	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	<0.01	<0.01	<0.01*	<0.01	<0.01
MW113	1200_MW113_231009	9/10/2023	ES2334612	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	<0.01	<0.01	<0.01*	<0.01	<0.01

Notes:
µg/L: micrograms per litre
LOR: limit of reporting
* LOR is above guideline value
^MW024 - contingency well for MW023
Denotes first time detection above LOR for Sum of PFHxS+PFOS or PFOA
Denotes new exceedance of human health screening criteria

Appendix C

Calibration Certificate

Sampling round: 202310-AECOM **Location:** Robertson Barracks-1200 **Project number & name:** 60612561 PFASOMP - & WQMP

PM: [redacted] **Field staff:** **Client:**

Date	YSI #	Temp (°C)	pH 4		pH 7		DO (100%)		EC 1413 (µS/cm)		ORP (mV)		Initials
			Pre-cal	Post-cal	Pre-cal	Post-cal	Pre-cal	Post-cal	Pre-cal	Post-cal	Pre-cal	Post-cal	
6/10/23	D	27.0	4.01	–	7.01	–	100	–	1622	1540	230.8	–	[redacted]
9/10/23	D	25.2	4.05	4.01	7.00	–	100	–	1864	1413	228.7	–	
							100						
11/10/23	D	28.1	3.95	4.01	7.07	7.00	100		1389	1470	225.4	[illegible]	
12/10/23	D	27.3	4.01	4.01	6.96	7.00	100		1483	1458	[illegible]	226.4	
							100						
							100						
							100						
							100						
							100						
							100						
							100						
							100						
							100						
							100						
							100						
							100						
							100						
							100						

Notes:

Appendix D

Lab Reports

CHAIN OF CUSTODY

COC#: 58221 ALS Laboratory: ES Sydney Environmental

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	[redacted]
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME: 10/10/23 0830

CLIENT: AECOMAU - AECOM AUSTRALIA PTY LTD

PROJECT: NT_1200_PFASOMP_23

SITE: 1200_PFASOMP_23

ORDER NO: 60612561/2.1

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH:

QUOTE NO: SY/139/19 V3

SAMPLER MOBILE: / ES2019AECOMAU0030

EMAIL REPORTS TO: [redacted]

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact?	Yes	No	N/A
Free ice / frozen ice bricks present upon receipt?	Yes	No	N/A
Random Sample Temperature on Receipt:		°C	
Other comments:			

Subcon / Forward Lab / Split WO
Lab / Analysis: NMI
Organised By / Date:
Relinquished By / Date:
Connote / Courier: QC FWP
WO No: ES2334612
Attach By PO / Internal Sheet:

SAMPLE DETAILS							ANALYSIS REQUIRED		
SAMPLE	NAME	DESCRIPTION	DATE / TIME	MATRIX	TOTAL BOTTLES	ON HOLD	PFAS Waters WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
001	1200_MW001_231009	Extra bottle for lab QC	09/10/2023 11:29 AM	WATER	ALS: 3 Non ALS: 0	No	X		
002	1200_MW004D_231009		09/10/2023 10:03 AM	WATER	ALS: 2 Non ALS: 0	No	X		
003	1200_MW012_231009		09/10/2023 12:11 PM	WATER	ALS: 2 Non ALS: 0	No	X		
004	1200_MW018_231006		06/10/2023 12:14 PM	WATER	ALS: 2 Non ALS: 0	No	X		
005	1200_MW021_231006		06/10/2023 01:11 PM	WATER	ALS: 2 Non ALS: 0	No	X		
006	1200_MW021D_231006		06/10/2023 01:10 PM	WATER	ALS: 2 Non ALS: 0	No	X		
007	1200_MW024_231006		06/10/2023 05:58 PM	WATER	ALS: 3 Non ALS: 0	No	X		

Environmental Division
Sydney
Work Order Reference
ES2334612

Telephone : +61-2-8784 8555

CHAIN OF CUSTODY

COC#: 58221 ALS Laboratory: ES Sydney Environmental

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	[redacted]
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME: 10/10/23 0830

CLIENT: AECOMAU - AECOM AUSTRALIA PTY LTD

PROJECT: NT_1200_PFASOMP_23

SITE: 1200_PFASOMP_23

ORDER NO: 60612561/2.1

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER:

CONTACT PH:

QUOTE NO: SY/139/19 V3

SAMPLER MOBILE:

/ ES2019AECOMAU0030

EMAIL REPORTS TO: [redacted]

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

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

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE DETAILS							ANALYSIS REQUIRED		
SAMPLE	NAME	DESCRIPTION	DATE / TIME	MATRIX	TOTAL BOTTLES	ON HOLD	PFAS Waters WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
008	1200_MW029_231009		09/10/2023 02:44 PM	WATER	ALS: 2 Non ALS: 0	No	X		
009	1200_MW030_2310		09/10/2023 02:29 PM	WATER	ALS: 2 Non ALS: 0	No	X		
010	1200_MW031_231009		09/10/2023 01:49 PM	WATER	ALS: 2 Non ALS: 0	No	X		
011	1200_MW032_231009		09/10/2023 10:24 AM	WATER	ALS: 2 Non ALS: 0	No	X		
012	1200_MW034_231009	Extra volume for lab QC	09/10/2023 12:54 PM	WATER	ALS: 3 Non ALS: 0	No	X		
013	1200_MW066_231009		09/10/2023 01:25 PM	WATER	ALS: 2 Non ALS: 0	No	X		
014	1200_MW080_231009		09/10/2023 10:53 AM	WATER	ALS: 2 . Non ALS: 0	No	X		

CHAIN OF CUSTODY

COC#: 58221 *ALS Laboratory:* ES Sydney Environmental

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	[redacted] DATE TIME: 10/10/23 0830

CLIENT: AECOMAU - AECOM AUSTRALIA PTY LTD

PROJECT: NT_1200_PFASOMP_23

SITE: 1200_PFASOMP_23

ORDER NO: 60612561/2.1

PROJECT MANAGER: [redacted]
PRIMARY SAMPLER:

CONTACT PH:
QUOTE NO: SY/139/19 V3
SAMPLER MOBILE:
/ ES2019AECOMAU0030

EMAIL REPORTS TO: [redacted]

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

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

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE DETAILS							ANALYSIS REQUIRED		
SAMPLE	NAME	DESCRIPTION	DATE / TIME	MATRIX	TOTAL BOTTLES	ON HOLD	PFAS Waters WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
015	1200_MW112_231009		09/10/2023 10:05 AM	WATER	ALS: 2 Non ALS: 0	No	X		
016	1200_MW113_231009		09/10/2023 10:06 AM	WATER	ALS: 2 Non ALS: 0	No	X		
017	1200_QC100_231009		09/10/2023 11:32 AM	WATER	ALS: 2 Non ALS: 0	No	X		
018	1200_QC200_231009		09/10/2023 11:32 AM	WATER	ALS: 2 Non ALS: 0	No	X	Please send to NMI Sydney for analysis	
019	1200_QC300_231006		09/10/2023 10:08 AM	WATER	ALS: 2 Non ALS: 0	No	X		
020	1200_QC400_231006		09/10/2023 10:10 AM	WATER	ALS: 2 Non ALS: 0	No	X		
021	1200_QC500_231006		09/10/2023 10:11 AM	WATER	ALS: 1 Non ALS: 0	No	X		

CHAIN OF CUSTODY

COC#: 58221 ALS Laboratory: ES Sydney Environmental

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	[redacted] 10/10/23 0830

CLIENT: AECOMAU - AECOM AUSTRALIA PTY LTD

PROJECT: NT_1200_PFASOMP_23

SITE: 1200_PFASOMP_23

ORDER NO: 60612561/2.1

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

PROJECT MANAGER: [redacted]
PRIMARY SAMPLER:

CONTACT PH:
QUOTE NO: SY/139/19 V3

SAMPLER MOBILE:
/ ES2019AECOMAU0030

EMAIL REPORTS TO: [redacted]

LABORATORY USE ONLY (Circle)

Custody Seal intact?	Yes	No	N/A
Free ice / frozen ice bricks present upon receipt?	Yes	No	N/A
Random Sample Temperature on Receipt:		°C	
Other comments:			

SAMPLE DETAILS							ANALYSIS REQUIRED		
SAMPLE	NAME	DESCRIPTION	DATE / TIME	MATRIX	TOTAL BOTTLES	ON HOLD	PFAS Waters WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
022	1200_QC101_231009		09/10/2023 12:56 PM	WATER	ALS: 2 Non ALS: 0	No	X		
023	1200_QC201_231009		09/10/2023 12:56 PM	WATER	ALS: 2 Non ALS: 0	No	X		
024	1200_QC301_231009		09/10/2023 10:09 AM	WATER	ALS: 2 Non ALS: 0	No	X		
025	1200_QC401_231009		09/10/2023 10:10 AM	WATER	ALS: 2 Non ALS: 0	No	X		
026	1200_MW012D_231009		09/10/2023 12:16 PM	WATER	ALS: 2 Non ALS: 0	No	X		

CHAIN OF CUSTODY

ALS COC#: 58221 ALS Laboratory: ES Sydney Environmental

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME: 10/10/23 0830

CLIENT: AECOMAU - AECOM AUSTRALIA PTY LTD

PROJECT: NT_1200_PFASOMP_23

SITE: 1200_PFASOMP_23

ORDER NO: 60612561/2.1

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER:

CONTACT PH:

QUOTE NO: SY/139/19 V3

SAMPLER MOBILE: / ES2019AECOMAU0030

EMAIL REPORTS TO: [redacted]

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

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

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE	SAMPLE NAME	BOTTLE NAME	VOLUME	BARCODE	TYPE	FILTERED	REASON
001	1200_MW001_231009	HDPE (no PTFE)	20 mL	00351219036469	Grey	No	
001	1200_MW001_231009	HDPE (no PTFE)	20 mL	00350822057992	Grey	No	
001	1200_MW001_231009	HDPE (no PTFE)	20 mL	00350822058077	Grey	No	
002	1200_MW004D_231009	HDPE (no PTFE)	20 mL	00350822058074	Grey	No	
002	1200_MW004D_231009	HDPE (no PTFE)	20 mL	00350822058026	Grey	No	
003	1200_MW012_231009	HDPE (no PTFE)	20 mL	00350822059070	Grey	No	
003	1200_MW012_231009	HDPE (no PTFE)	20 mL	00350822081692	Grey	No	
004	1200_MW018_231006	HDPE (no PTFE)	20 mL	00350822058022	Grey	No	
004	1200_MW018_231006	HDPE (no PTFE)	20 mL	00350822058043	Grey	No	
005	1200_MW021_231006	HDPE (no PTFE)	20 mL	00350822059206	Grey	No	
005	1200_MW021_231006	HDPE (no PTFE)	20 mL	00350822059102	Grey	No	
006	1200_MW021D_231006	HDPE (no PTFE)	20 mL	00350822059058	Grey	No	
006	1200_MW021D_231006	HDPE (no PTFE)	20 mL	00350822059050	Grey	No	
007	1200_MW024_231006	HDPE (no PTFE)	20 mL	00350822058033	Grey	No	
007	1200_MW024_231006	HDPE (no PTFE)	20 mL	00350822058039	Grey	No	
007	1200_MW024_231006	HDPE (no PTFE)	20 mL	00351219036416	Grey	No	
008	1200_MW029_231009	HDPE (no PTFE)	20 mL	00350822057995	Grey	No	
008	1200_MW029_231009	HDPE (no PTFE)	20 mL	00350822058038	Grey	No	
009	1200_MW030_2310	HDPE (no PTFE)	20 mL	00350822058045	Grey	No	
009	1200_MW030_2310	HDPE (no PTFE)	20 mL	00350822058063	Grey	No	
010	1200_MW031_231009	HDPE (no PTFE)	20 mL	00350822057968	Grey	No	
010	1200_MW031_231009	HDPE (no PTFE)	20 mL	00350822057977	Grey	No	
011	1200_MW032_231009	HDPE (no PTFE)	20 mL	00350822057986	Grey	No	
011	1200_MW032_231009	HDPE (no PTFE)	20 mL	00350822057989	Grey	No	
012	1200_MW034_231009	HDPE (no PTFE)	20 mL	00350719054602	Grey	No	
012	1200_MW034_231009	HDPE (no PTFE)	20 mL	00350822058089	Grey	No	

CHAIN OF CUSTODY

COC#: 58221 ALS Laboratory: ES Sydney Environmental

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	[redacted] 10/10/23 0830

CLIENT: AECOMAU - AECOM AUSTRALIA PTY LTD

PROJECT: NT_1200_PFASOMP_23

SITE: 1200_PFASOMP_23

ORDER NO: 60612561/2.1

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

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

Random Sample Temperature on Receipt: °C

Other comments:

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER:

CONTACT PH:

QUOTE NO: SY/139/19 V3

SAMPLER MOBILE:

/ ES2019AECOMAU0030

EMAIL REPORTS TO: [redacted]

012	1200_MW034_231009	HDPE (no PTFE)	20 mL	00350822058037	Grey	No	
013	1200_MW066_231009	HDPE (no PTFE)	20 mL	00350822058056	Grey	No	
013	1200_MW066_231009	HDPE (no PTFE)	20 mL	00350822057990	Grey	No	
014	1200_MW080_231009	HDPE (no PTFE)	20 mL	00350822058092	Grey	No	
014	1200_MW080_231009	HDPE (no PTFE)	20 mL	00350822057985	Grey	No	
015	1200_MW112_231009	HDPE (no PTFE)	20 mL	00350822081657	Grey	No	
015	1200_MW112_231009	HDPE (no PTFE)	20 mL	00350822059147	Grey	No	
016	1200_MW113_231009	HDPE (no PTFE)	20 mL	00350822057994	Grey	No	
016	1200_MW113_231009	HDPE (no PTFE)	20 mL	00350822058044	Grey	No	
017	1200_QC100_231009	HDPE (no PTFE)	20 mL	00350822058072	Grey	No	
017	1200_QC100_231009	HDPE (no PTFE)	20 mL	00350822082935	Grey	No	
018	1200_QC200_231009	HDPE (no PTFE)	20 mL	00350822057987	Grey	No	
018	1200_QC200_231009	HDPE (no PTFE)	20 mL	00350822083044	Grey	No	
019	1200_QC300_231006	HDPE (no PTFE)	20 mL	00350822057984	Grey	No	
019	1200_QC300_231006	HDPE (no PTFE)	20 mL	00350822058087	Grey	No	
020	1200_QC400_231006	HDPE (no PTFE)	20 mL	00350822082984	Grey	No	
020	1200_QC400_231006	HDPE (no PTFE)	20 mL	00350822083136	Grey	No	
021	1200_QC500_231006	HDPE (no PTFE)	20 mL	00350822058030	Grey	No	
022	1200_QC101_231009	HDPE (no PTFE)	20 mL	00350822057965	Grey	No	
022	1200_QC101_231009	HDPE (no PTFE)	20 mL	00350822058027	Grey	No	
023	1200_QC201_231009	HDPE (no PTFE)	20 mL	00350822058104	Grey	No	
023	1200_QC201_231009	HDPE (no PTFE)	20 mL	00350822058082	Grey	No	
024	1200_QC301_231009	HDPE (no PTFE)	20 mL	00350822058086	Grey	No	
024	1200_QC301_231009	HDPE (no PTFE)	20 mL	00350822058014	Grey	No	
025	1200_QC401_231009	HDPE (no PTFE)	20 mL	00350822057997	Grey	No	
025	1200_QC401_231009	HDPE (no PTFE)	20 mL	00350822058000	Grey	No	
026	1200_MW012D_231009	HDPE (no PTFE)	20 mL	00350822082927	Grey	No	

CHAIN OF CUSTODY

COC#: **58221** *ALS Laboratory:* ES Sydney Environmental

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	[redacted] DATE TIME: 10/10/23 0830

CLIENT: AECOMAU - AECOM AUSTRALIA PTY LTD

PROJECT: NT_1200_PFASOMP_23

SITE: 1200_PFASOMP_23

ORDER NO: 60612561/2.1

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER:

CONTACT PH:

QUOTE NO: SY/139/19 V3

SAMPLER MOBILE: / ES2019AECOMAU0030

EMAIL REPORTS TO: [redacted]

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact?	Yes	No	N/A
Free ice / frozen ice bricks present upon receipt?	Yes	No	N/A
Random Sample Temperature on Receipt:		°C	
Other comments:			

026	1200_MW012D_231009	HDPE (no PTFE)	20 mL	00350822082954	Grey	No	

Total Bottle Count: ALS: 54, Non ALS: 0

SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order	: **ES2334612**		
Client	: **AECOM AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Sydney
Contact	: [redacted]	Contact	: [redacted]
Address	: [redacted]	Address	: [redacted]
E-mail	: [redacted]	E-mail	: [redacted]
Telephone	: [redacted]	Telephone	: [redacted]
Facsimile	: ----	Facsimile	: [redacted]
Project	: NT_1200_PFASOMP_23	Page	: 1 of 3
Order number	: 60612561/2.1	Quote number	: ES2019AECOMAU0030 (SY/139/19 V3)
C-O-C number	: 58221	QC Level	: NEPM 2013 B3 & ALS QC Standard
Site	: 1200_PFASOMP_23		
Sampler	: [redacted]		

Dates

Date Samples Received	: 10-Oct-2023 08:30	Issue Date	: 10-Oct-2023
Client Requested Due Date	: 17-Oct-2023	Scheduled Reporting Date	: **17-Oct-2023**

Delivery Details

Mode of Delivery	: Client Drop Off	Security Seal	: Not Available
No. of coolers/boxes	: 1	Temperature	: 16.8'C DRW 5.4'C 4.8'C 4.5'C SYD - Ice present
Receipt Detail	:	No. of samples received / analysed	: 26 / 26

General Comments

- This report contains the following information:
  - Sample Container(s)/Preservation Non-Compliances
  - Summary of Sample(s) and Requested Analysis
  - Proactive Holding Time Report
  - Requested Deliverables
- **Please refer to the Proactive Holding Time Report table below which summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory. The laboratory will process these samples unless instructions are received from you indicating you do not wish to proceed. The absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.**
- **QC Forward analysis will be conducted by NMI.**
- Please direct any queries you have regarding this work order to the above ALS laboratory contact.
- Analytical work for this work order will be conducted at ALS Sydney.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months ± 1 week) from receipt of samples.
- Please be aware that APHA/NEPM recommends water and soil samples be chilled to less than or equal to 6°C for chemical analysis, and less than or equal to 10°C but unfrozen for Microbiological analysis. Where samples are received above this temperature, it should be taken into consideration when interpreting results. Refer to ALS EnviroMail 85 for ALS recommendations of the best practice for chilling samples after sampling and for maintaining a cool temperature during transit.

Sample Container(s)/Preservation Non-Compliances

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

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

Summary of Sample(s) and Requested Analysis

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

Matrix: **WATER**

Laboratory sample ID	Sampling date / time	Sample ID	WATER - EP231X PFAS - Full Suite (28 analytes)
ES2334612-001	09-Oct-2023 09:59	1200_MW001_231009	✓
ES2334612-002	09-Oct-2023 08:33	1200_MW004D_231009	✓
ES2334612-003	09-Oct-2023 10:41	1200_MW012_231009	✓
ES2334612-004	06-Oct-2023 10:44	1200_MW018_231006	✓
ES2334612-005	06-Oct-2023 11:41	1200_MW021_231006	✓
ES2334612-006	06-Oct-2023 11:40	1200_MW021D_231006	✓
ES2334612-007	06-Oct-2023 16:28	1200_MW024_231006	✓
ES2334612-008	09-Oct-2023 13:14	1200_MW029_231009	✓
ES2334612-009	09-Oct-2023 12:59	1200_MW030_2310	✓
ES2334612-010	09-Oct-2023 12:19	1200_MW031_231009	✓
ES2334612-011	09-Oct-2023 08:54	1200_MW032_231009	✓
ES2334612-012	09-Oct-2023 11:24	1200_MW034_231009	✓
ES2334612-013	09-Oct-2023 11:55	1200_MW066_231009	✓
ES2334612-014	09-Oct-2023 09:23	1200_MW080_231009	✓
ES2334612-015	09-Oct-2023 08:35	1200_MW112_231009	✓
ES2334612-016	09-Oct-2023 08:36	1200_MW113_231009	✓
ES2334612-017	09-Oct-2023 10:02	1200_QC100_231009	✓
ES2334612-018	09-Oct-2023 10:02	1200_QC200_231009	✓
ES2334612-019	09-Oct-2023 08:38	1200_QC300_231006	✓
ES2334612-020	09-Oct-2023 08:40	1200_QC400_231006	✓
ES2334612-021	09-Oct-2023 08:41	1200_QC500_231006	✓
ES2334612-022	09-Oct-2023 11:26	1200_QC101_231009	✓
ES2334612-023	09-Oct-2023 11:26	1200_QC201_231009	✓
ES2334612-024	09-Oct-2023 08:39	1200_QC301_231009	✓
ES2334612-025	09-Oct-2023 08:40	1200_QC401_231009	✓
ES2334612-026	09-Oct-2023 10:46	1200_MW012D_231009	✓

Proactive Holding Time Report

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

Requested Deliverables

CERTIFICATE OF ANALYSIS

Work Order	: **ES2334612**	Page	: 1 of 13
Client	: **AECOM AUSTRALIA PTY LTD**	Laboratory	: [redacted]
Contact	: [redacted]	Contact	: [redacted]
Address	: [redacted]	Address	: [redacted]
Telephone	: [redacted]	Telephone	: [redacted]
Project	: NT_1200_PFASOMP_23	Date Samples Received	: 10-Oct-2023 08:30
Order number	: 60612561/2.1	Date Analysis Commenced	: 10-Oct-2023
C-O-C number	: 58221	Issue Date	: 13-Oct-2023 09:59
Sampler	: [redacted]		
Site	: 1200_PFASOMP_23		
Quote number	: SY/139/19 V3		
No. of samples received	: 26		
No. of samples analysed	: 24		

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

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

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

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

Signatories

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

Signatories	*Position*	*Accreditation Category*
[redacted]		

General Comments

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

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

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

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

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

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

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

- EP231X - Per- and Polyfluoroalkyl Substances (PFAS): Samples received in 20ml or 125ml bottles have been tested in accordance with the QSM5.3 compliant, NATA accredited method. 60mL or 250mL bottles have been tested to the legacy QSM 5.1 aligned, NATA accredited method.
- EP231: Stable isotope enriched internal standards are added to samples prior to extraction. Target compounds have a direct analogous internal standard with the exception of PFPeS, PFHpA, PFDS, PFTrDA and 10:2 FTS. These compounds use an internal standard that is chemically related and has a retention time close to that of the target compound. The DQO for internal standard response is 50-150% of that established at initial calibration. PFOS is quantified using a certified, traceable standard consisting of linear and branched PFOS isomers. These practices are in line with recommendations in the National Environmental Management Plan for PFAS (Australian HEPA) and also conform to QSM 5.3 (US DoD) requirements.

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	1200_MW001_231009	1200_MW004D_231009	1200_MW012_231009	1200_MW018_231006	1200_MW021_231006
				Sampling date / time	09-Oct-2023 09:59	09-Oct-2023 08:33	09-Oct-2023 10:41	06-Oct-2023 10:44	06-Oct-2023 11:41
Compound	CAS Number	LOR	Unit		ES2334612-001	ES2334612-002	ES2334612-003	ES2334612-004	ES2334612-005
					Result	Result	Result	Result	Result
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		**0.04**	<0.01	<0.01	<0.01	<0.01
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		**0.09**	**0.01**	<0.01	<0.01	<0.01
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		<0.1	<0.1	<0.1	<0.1	<0.1
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	1200_MW001_231009	1200_MW004D_231009	1200_MW012_231009	1200_MW018_231006	1200_MW021_231006
				Sampling date / time	09-Oct-2023 09:59	09-Oct-2023 08:33	09-Oct-2023 10:41	06-Oct-2023 10:44	06-Oct-2023 11:41
Compound	CAS Number	LOR	Unit		ES2334612-001	ES2334612-002	ES2334612-003	ES2334612-004	ES2334612-005
					Result	Result	Result	Result	Result
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L		**0.13**	**0.01**	<0.01	<0.01	<0.01
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		**0.13**	**0.01**	<0.01	<0.01	<0.01
Sum of PFAS (WA DER List)	----	0.01	µg/L		**0.13**	**0.01**	<0.01	<0.01	<0.01
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**98.2**	**95.5**	**95.4**	**90.6**	**93.3**
13C8-PFOA	----	0.02	%		**97.2**	**95.1**	**95.4**	**97.4**	**96.8**

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	1200_MW021D_231006	1200_MW024_231006	1200_MW029_231009	1200_MW030_2310	1200_MW031_231009
				Sampling date / time	06-Oct-2023 11:40	06-Oct-2023 16:28	09-Oct-2023 13:14	09-Oct-2023 12:59	09-Oct-2023 12:19
Compound	CAS Number	LOR	Unit		ES2334612-006	ES2334612-007	ES2334612-008	ES2334612-009	ES2334612-010
					Result	Result	Result	Result	Result
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		<0.01	<0.01	<0.01	**0.03**	<0.01
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		<0.01	<0.01	<0.01	**0.08**	<0.01
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		<0.1	<0.1	<0.1	<0.1	<0.1
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	1200_MW021D_231006	1200_MW024_231006	1200_MW029_231009	1200_MW030_2310	1200_MW031_231009
				Sampling date / time	06-Oct-2023 11:40	06-Oct-2023 16:28	09-Oct-2023 13:14	09-Oct-2023 12:59	09-Oct-2023 12:19
Compound	CAS Number	LOR	Unit		ES2334612-006	ES2334612-007	ES2334612-008	ES2334612-009	ES2334612-010
					Result	Result	Result	Result	Result
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L		<0.01	<0.01	<0.01	**0.11**	<0.01
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		<0.01	<0.01	<0.01	**0.11**	<0.01
Sum of PFAS (WA DER List)	----	0.01	µg/L		<0.01	<0.01	<0.01	**0.11**	<0.01
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**92.3**	**90.6**	**90.3**	**97.1**	**95.5**
13C8-PFOA	----	0.02	%		**95.0**	**101**	**98.9**	**95.7**	**97.1**

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	1200_MW032_231009	1200_MW034_231009	1200_MW066_231009	1200_MW080_231009	1200_MW112_231009
				Sampling date / time	09-Oct-2023 08:54	09-Oct-2023 11:24	09-Oct-2023 11:55	09-Oct-2023 09:23	09-Oct-2023 08:35
Compound	CAS Number	LOR	Unit		ES2334612-011	ES2334612-012	ES2334612-013	ES2334612-014	ES2334612-015
					Result	Result	Result	Result	Result
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		**0.02**	**0.03**	**0.09**	<0.01	<0.01
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		**0.04**	**0.10**	**0.36**	**0.02**	<0.01
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		<0.1	<0.1	<0.1	<0.1	<0.1
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		<0.02	**0.04**	<0.02	<0.02	<0.02
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		<0.02	**0.04**	**0.03**	<0.02	<0.02
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		<0.01	<0.01	**0.02**	<0.01	<0.01
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	1200_MW032_231009	1200_MW034_231009	1200_MW066_231009	1200_MW080_231009	1200_MW112_231009
				Sampling date / time	09-Oct-2023 08:54	09-Oct-2023 11:24	09-Oct-2023 11:55	09-Oct-2023 09:23	09-Oct-2023 08:35
Compound	CAS Number	LOR	Unit		ES2334612-011	ES2334612-012	ES2334612-013	ES2334612-014	ES2334612-015
					Result	Result	Result	Result	Result
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L		**0.06**	**0.21**	**0.50**	**0.02**	<0.01
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		**0.06**	**0.13**	**0.45**	**0.02**	<0.01
Sum of PFAS (WA DER List)	----	0.01	µg/L		**0.06**	**0.21**	**0.50**	**0.02**	<0.01
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**90.0**	**86.1**	**90.8**	**88.4**	**91.2**
13C8-PFOA	----	0.02	%		**96.7**	**97.3**	**95.9**	**101**	**101**

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	1200_MW113_231009	1200_QC100_231009	1200_QC300_231006	1200_QC400_231006	1200_QC500_231006
				Sampling date / time	09-Oct-2023 08:36	09-Oct-2023 10:02	09-Oct-2023 08:38	09-Oct-2023 08:40	09-Oct-2023 08:41
Compound	CAS Number	LOR	Unit		ES2334612-016	ES2334612-017	ES2334612-019	ES2334612-020	ES2334612-021
					Result	Result	Result	Result	Result
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		<0.01	**0.04**	<0.01	<0.01	<0.01
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		<0.01	**0.10**	<0.01	<0.01	<0.01
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		<0.1	<0.1	<0.1	<0.1	<0.1
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	1200_MW113_231009	1200_QC100_231009	1200_QC300_231006	1200_QC400_231006	1200_QC500_231006
				Sampling date / time	09-Oct-2023 08:36	09-Oct-2023 10:02	09-Oct-2023 08:38	09-Oct-2023 08:40	09-Oct-2023 08:41
Compound	CAS Number	LOR	Unit		ES2334612-016	ES2334612-017	ES2334612-019	ES2334612-020	ES2334612-021
					Result	Result	Result	Result	Result
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L		<0.01	**0.14**	<0.01	<0.01	<0.01
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		<0.01	**0.14**	<0.01	<0.01	<0.01
Sum of PFAS (WA DER List)	----	0.01	µg/L		<0.01	**0.14**	<0.01	<0.01	<0.01
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**93.3**	**94.3**	**92.9**	**92.8**	**92.5**
13C8-PFOA	----	0.02	%		**98.4**	**95.3**	**100**	**89.9**	**89.4**

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	1200_QC101_231009	1200_QC301_231009	1200_QC401_231009	1200_MW012D_231009	----
				Sampling date / time	09-Oct-2023 11:26	09-Oct-2023 08:39	09-Oct-2023 08:40	09-Oct-2023 10:46	----
Compound	CAS Number	LOR	Unit		ES2334612-022	ES2334612-024	ES2334612-025	ES2334612-026	--------
					Result	Result	Result	Result	----
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		**0.03**	<0.01	<0.01	<0.01	----
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		**0.12**	<0.01	<0.01	<0.01	----
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		<0.1	<0.1	<0.1	<0.1	----
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		**0.04**	<0.02	<0.02	<0.02	----
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		**0.04**	<0.02	<0.02	<0.02	----
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	----
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	----
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	----
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	----

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	1200_QC101_231009	1200_QC301_231009	1200_QC401_231009	1200_MW012D_231009	----
				Sampling date / time	09-Oct-2023 11:26	09-Oct-2023 08:39	09-Oct-2023 08:40	09-Oct-2023 10:46	----
Compound	CAS Number	LOR	Unit		ES2334612-022	ES2334612-024	ES2334612-025	ES2334612-026	--------
					Result	Result	Result	Result	----
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	----
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	----
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	----
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	----
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	----
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	----
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L		**0.23**	<0.01	<0.01	<0.01	----
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		**0.15**	<0.01	<0.01	<0.01	----
Sum of PFAS (WA DER List)	----	0.01	µg/L		**0.23**	<0.01	<0.01	<0.01	----
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**95.4**	**92.7**	**92.3**	**91.0**	----
13C8-PFOA	----	0.02	%		**89.5**	**95.2**	**94.3**	**95.6**	----

Surrogate Control Limits

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

QUALITY CONTROL REPORT

Work Order	: **ES2334612**	Page	: 1 of 8
Client	: **AECOM AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Sydney
Contact	: [redacted]	Contact	: [redacted]
Address	: [redacted]	Address	: [redacted]
Telephone	: [redacted]	Telephone	: [redacted]
Project	: NT_1200_PFASOMP_23	Date Samples Received	: 10-Oct-2023
Order number	: 60612561/2.1	Date Analysis Commenced	: 10-Oct-2023
C-O-C number	: 58221	Issue Date	: 13-Oct-2023
Sampler	: [redacted]		
Site	: 1200_PFASOMP_23		
Quote number	: SY/139/19 V3		
No. of samples received	: 26		
No. of samples analysed	: 24		

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

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

This Quality Control Report contains the following information:

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

Signatories

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

Signatories	*Position*	*Accreditation Category*
[redacted]		

General Comments

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

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

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

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

Laboratory Duplicate (DUP) Report

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

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 5350083)									
ES2334612-001	1200_MW001_231009	EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	0.04	0.04	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	0.09	0.09	0.0	No Limit
		EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
ES2334612-012	1200_MW034_231009	EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	0.03	0.02	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	0.10	0.10	0.0	0% - 50%
		EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 5350083)									
ES2334612-001	1200_MW001_231009	EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	<0.1	0.0	No Limit

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 5350083) - continued									
ES2334612-012	1200_MW034_231009	EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	0.04	0.04	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	0.04	0.04	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	<0.1	0.0	No Limit
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 5350083)									
ES2334612-001	1200_MW001_231009	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
ES2334612-012	1200_MW034_231009	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 5350083)									
ES2334612-001	1200_MW001_231009	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 5350083) - continued									
ES2334612-001	1200_MW001_231009	EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	<0.05	0.0	No Limit
ES2334612-012	1200_MW034_231009	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP231P: PFAS Sums (QC Lot: 5350083)									
ES2334612-001	1200_MW001_231009	EP231X: Sum of PFAS	----	0.01	µg/L	0.13	0.13	0.0	0% - 50%
ES2334612-012	1200_MW034_231009	EP231X: Sum of PFAS	----	0.01	µg/L	0.21	0.20	4.9	0% - 20%

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

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

Sub-Matrix: **WATER**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5350083)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.25 µg/L	84.6	72.0	130
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.25 µg/L	89.2	71.0	127
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	0.25 µg/L	90.6	68.0	131
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.25 µg/L	99.9	69.0	134
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.25 µg/L	91.7	65.0	140
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.25 µg/L	90.8	53.0	142
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5350089)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.25 µg/L	98.0	72.0	130
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.25 µg/L	88.5	71.0	127
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	0.25 µg/L	103	68.0	131
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.25 µg/L	106	69.0	134
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.25 µg/L	94.3	65.0	140
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.25 µg/L	85.9	53.0	142
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5350083)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	1.25 µg/L	92.1	73.0	129
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	0.25 µg/L	98.2	72.0	129
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	0.25 µg/L	100	72.0	129
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	0.25 µg/L	96.0	72.0	130
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	0.25 µg/L	99.1	71.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	0.25 µg/L	96.8	69.0	130
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	0.25 µg/L	104	71.0	129
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	0.25 µg/L	88.4	69.0	133
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	0.25 µg/L	112	72.0	134
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	0.25 µg/L	99.6	65.0	144
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	0.625 µg/L	95.3	71.0	132
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5350089)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	1.25 µg/L	78.9	73.0	129
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	0.25 µg/L	110	72.0	129
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	0.25 µg/L	117	72.0	129
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	0.25 µg/L	102	72.0	130

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
				Result	Concentration	LCS	Low	High
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5350089) - continued								
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	0.25 µg/L	99.0	71.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	0.25 µg/L	102	69.0	130
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	0.25 µg/L	86.3	71.0	129
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	0.25 µg/L	83.2	69.0	133
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	0.25 µg/L	103	72.0	134
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	0.25 µg/L	109	65.0	144
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	0.625 µg/L	120	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5350083)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.25 µg/L	85.3	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	0.625 µg/L	107	68.0	141
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	0.625 µg/L	100	62.6	147
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	0.625 µg/L	102	66.0	145
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	0.625 µg/L	102	57.6	145
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	0.25 µg/L	95.9	65.0	136
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	0.25 µg/L	97.2	61.0	135
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5350089)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.25 µg/L	98.5	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	0.625 µg/L	96.4	68.0	141
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	0.625 µg/L	74.2	62.6	147
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	0.625 µg/L	99.9	66.0	145
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	0.625 µg/L	105	57.6	145
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	0.25 µg/L	84.2	65.0	136
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	0.25 µg/L	98.7	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5350083)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.25 µg/L	86.4	63.0	143
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	0.25 µg/L	104	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	0.25 µg/L	94.2	67.0	138
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	0.25 µg/L	78.4	71.4	144

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Acceptable Limits (%): Low	Acceptable Limits (%): High
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5350089)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.25 µg/L	89.4	63.0	143
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	0.25 µg/L	98.0	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	0.25 µg/L	83.5	67.0	138
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	0.25 µg/L	80.4	71.4	144

Matrix Spike (MS) Report

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

Sub-Matrix: **WATER**

Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report: Spike Concentration	SpikeRecovery(%): MS	Acceptable Limits (%): Low	Acceptable Limits (%): High
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5350083)							
ES2334612-012	1200_MW034_231009	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.25 µg/L	85.1	72.0	130
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.25 µg/L	89.5	71.0	127
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.25 µg/L	87.4	68.0	131
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.25 µg/L	95.8	69.0	134
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.25 µg/L	86.7	65.0	140
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.25 µg/L	85.6	53.0	142
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5350083)							
ES2334612-012	1200_MW034_231009	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	1.25 µg/L	92.6	73.0	129
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.25 µg/L	92.7	72.0	129
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.25 µg/L	97.0	72.0	129
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.25 µg/L	92.5	72.0	130
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.25 µg/L	102	71.0	133
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.25 µg/L	93.6	69.0	130
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.25 µg/L	97.5	71.0	129
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.25 µg/L	95.6	69.0	133
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.25 µg/L	100	72.0	134
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.25 µg/L	99.2	65.0	144
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.625 µg/L	96.7	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5350083)							
ES2334612-012	1200_MW034_231009	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.25 µg/L	88.9	67.0	137
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.625 µg/L	101	68.0	141
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.625 µg/L	97.5	62.6	147
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.625 µg/L	95.6	66.0	145

Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*Concentration*	*MS*	*Low*	*High*
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5350083) - continued							
ES2334612-012	1200_MW034_231009	EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.625 µg/L	93.2	57.6	145
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.25 µg/L	90.3	65.0	136
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.25 µg/L	89.8	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5350083)							
ES2334612-012	1200_MW034_231009	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.25 µg/L	88.1	63.0	143
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.25 µg/L	101	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.25 µg/L	105	67.0	138
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.25 µg/L	86.5	71.4	144

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **ES2334612**	Page	: 1 of 6
Client	: **AECOM AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Sydney
Contact	: [redacted]	Telephone	: [redacted]
Project	: NT_1200_PFASOMP_23	Date Samples Received	: 10-Oct-2023
Site	: 1200_PFASOMP_23	Issue Date	: 13-Oct-2023
Sampler	: [redacted]	No. of samples received	: 26
Order number	: 60612561/2.1	No. of samples analysed	: 24

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

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

Summary of Outliers

Outliers : Quality Control Samples

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

- **NO Method Blank value outliers occur.**
- **NO Duplicate outliers occur.**
- **NO Laboratory Control outliers occur.**
- **NO Matrix Spike outliers occur.**
- **For all regular sample matrices, NO surrogate recovery outliers occur.**

Outliers : Analysis Holding Time Compliance

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

Outliers : Frequency of Quality Control Samples

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

Outliers : Frequency of Quality Control Samples

Matrix: **WATER**

Quality Control Sample Type / Method	Count QC	Count Regular	Rate (%) Actual	Rate (%) Expected	Quality Control Specification
Laboratory Duplicates (DUP)					
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	2	24	8.33	10.00	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)					
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	1	24	4.17	5.00	NEPM 2013 B3 & ALS QC Standard

Analysis Holding Time Compliance

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

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

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

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

Matrix: **WATER**

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

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation: Date extracted	Due for extraction	Evaluation	Analysis: Date analysed	Due for analysis	Evaluation
EP231A: Perfluoroalkyl Sulfonic Acids							
HDPE (no PTFE) (EP231X) 1200_MW018_231006, 1200_MW021_231006, 1200_MW021D_231006, 1200_MW024_231006	**06-Oct-2023**	**10-Oct-2023**	03-Apr-2024	✓	**13-Oct-2023**	03-Apr-2024	✓
HDPE (no PTFE) (EP231X) 1200_QC400_231006, 1200_QC500_231006, 1200_QC101_231009, 1200_QC301_231009, 1200_QC401_231009, 1200_MW012D_231009	**09-Oct-2023**	**10-Oct-2023**	06-Apr-2024	✓	**12-Oct-2023**	06-Apr-2024	✓
HDPE (no PTFE) (EP231X) 1200_MW001_231009, 1200_MW004D_231009, 1200_MW012_231009, 1200_MW029_231009, 1200_MW030_2310, 1200_MW031_231009, 1200_MW032_231009, 1200_MW034_231009, 1200_MW066_231009, 1200_MW080_231009, 1200_MW112_231009, 1200_MW113_231009, 1200_QC100_231009, 1200_QC300_231006	**09-Oct-2023**	**10-Oct-2023**	06-Apr-2024	✓	**13-Oct-2023**	06-Apr-2024	✓

Matrix: **WATER**

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

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP231B: Perfluoroalkyl Carboxylic Acids							
HDPE (no PTFE) (EP231X) 1200_MW018_231006, 1200_MW021_231006, 1200_MW021D_231006, 1200_MW024_231006	**06-Oct-2023**	**10-Oct-2023**	03-Apr-2024	✓	**13-Oct-2023**	03-Apr-2024	✓
HDPE (no PTFE) (EP231X) 1200_QC400_231006, 1200_QC500_231006, 1200_QC101_231009, 1200_QC301_231009, 1200_QC401_231009, 1200_MW012D_231009	**09-Oct-2023**	**10-Oct-2023**	06-Apr-2024	✓	**12-Oct-2023**	06-Apr-2024	✓
HDPE (no PTFE) (EP231X) 1200_MW001_231009, 1200_MW004D_231009, 1200_MW012_231009, 1200_MW029_231009, 1200_MW030_2310, 1200_MW031_231009, 1200_MW032_231009, 1200_MW034_231009, 1200_MW066_231009, 1200_MW080_231009, 1200_MW112_231009, 1200_MW113_231009, 1200_QC100_231009, 1200_QC300_231006	**09-Oct-2023**	**10-Oct-2023**	06-Apr-2024	✓	**13-Oct-2023**	06-Apr-2024	✓
EP231C: Perfluoroalkyl Sulfonamides							
HDPE (no PTFE) (EP231X) 1200_MW018_231006, 1200_MW021_231006, 1200_MW021D_231006, 1200_MW024_231006	**06-Oct-2023**	**10-Oct-2023**	03-Apr-2024	✓	**13-Oct-2023**	03-Apr-2024	✓
HDPE (no PTFE) (EP231X) 1200_QC400_231006, 1200_QC500_231006, 1200_QC101_231009, 1200_QC301_231009, 1200_QC401_231009, 1200_MW012D_231009	**09-Oct-2023**	**10-Oct-2023**	06-Apr-2024	✓	**12-Oct-2023**	06-Apr-2024	✓
HDPE (no PTFE) (EP231X) 1200_MW001_231009, 1200_MW004D_231009, 1200_MW012_231009, 1200_MW029_231009, 1200_MW030_2310, 1200_MW031_231009, 1200_MW032_231009, 1200_MW034_231009, 1200_MW066_231009, 1200_MW080_231009, 1200_MW112_231009, 1200_MW113_231009, 1200_QC100_231009, 1200_QC300_231006	**09-Oct-2023**	**10-Oct-2023**	06-Apr-2024	✓	**13-Oct-2023**	06-Apr-2024	✓

Matrix: **WATER**

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

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP231D: (n:2) Fluorotelomer Sulfonic Acids							
HDPE (no PTFE) (EP231X) 1200_MW018_231006, 1200_MW021_231006, 1200_MW021D_231006, 1200_MW024_231006	**06-Oct-2023**	**10-Oct-2023**	03-Apr-2024	✓	**13-Oct-2023**	03-Apr-2024	✓
HDPE (no PTFE) (EP231X) 1200_QC400_231006, 1200_QC500_231006, 1200_QC101_231009, 1200_QC301_231009, 1200_QC401_231009, 1200_MW012D_231009	**09-Oct-2023**	**10-Oct-2023**	06-Apr-2024	✓	**12-Oct-2023**	06-Apr-2024	✓
HDPE (no PTFE) (EP231X) 1200_MW001_231009, 1200_MW004D_231009, 1200_MW012_231009, 1200_MW029_231009, 1200_MW030_2310, 1200_MW031_231009, 1200_MW032_231009, 1200_MW034_231009, 1200_MW066_231009, 1200_MW080_231009, 1200_MW112_231009, 1200_MW113_231009, 1200_QC100_231009, 1200_QC300_231006	**09-Oct-2023**	**10-Oct-2023**	06-Apr-2024	✓	**13-Oct-2023**	06-Apr-2024	✓
EP231P: PFAS Sums							
HDPE (no PTFE) (EP231X) 1200_MW018_231006, 1200_MW021_231006, 1200_MW021D_231006, 1200_MW024_231006	**06-Oct-2023**	**10-Oct-2023**	03-Apr-2024	✓	**13-Oct-2023**	03-Apr-2024	✓
HDPE (no PTFE) (EP231X) 1200_QC400_231006, 1200_QC500_231006, 1200_QC101_231009, 1200_QC301_231009, 1200_QC401_231009, 1200_MW012D_231009	**09-Oct-2023**	**10-Oct-2023**	06-Apr-2024	✓	**12-Oct-2023**	06-Apr-2024	✓
HDPE (no PTFE) (EP231X) 1200_MW001_231009, 1200_MW004D_231009, 1200_MW012_231009, 1200_MW029_231009, 1200_MW030_2310, 1200_MW031_231009, 1200_MW032_231009, 1200_MW034_231009, 1200_MW066_231009, 1200_MW080_231009, 1200_MW112_231009, 1200_MW113_231009, 1200_QC100_231009, 1200_QC300_231006	**09-Oct-2023**	**10-Oct-2023**	06-Apr-2024	✓	**13-Oct-2023**	06-Apr-2024	✓

Quality Control Parameter Frequency Compliance

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

Matrix: **WATER**

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

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	24	**8.33**	**10.00**	×	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	24	**8.33**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	24	**8.33**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	24	**4.17**	**5.00**	×	NEPM 2013 B3 & ALS QC Standard

Brief Method Summaries

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

Analytical Methods	Method	Matrix	Method Descriptions
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	WATER	In-house: Analysis of fresh and saline waters by Solid Phase Extraction (SPE) followed by LC-Electrospray-MS-MS, Negative Mode using MRM and internal standard quantitation. Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to the sample container. The entire contents are transferred to a solid phase extraction (SPE) cartridge. The sample container is successively rinsed with aliquots of the elution solvent. The eluted extract is combined with an equal volume of reagent water and a portion is filtered for analysis. Method procedures and data quality objectives conform to US DoD QSM 5.3, table B-15 requirements.

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

Australian Government

National Measurement Institute

QUALITY ASSURANCE REPORT

Client: AECOM AUSTRALIA PTY LTD

NMI QA Report No: AECO06/231011 **Sample Matrix:** Liquid

Analyte	Method	LOR	Blank	Sample Duplicates			Recoveries	
				Sample	Duplicate	RPD	LCS	Matrix Spike
		ug/L	ug/L	ug/L	ug/L	%	%	%
PFBA (375-22-4)	NR70	0.05	<0.05	NA	NA	NA	115	NA
PFPeA (2706-90-3)	NR70	0.02	<0.02	NA	NA	NA	104	NA
PFHxA (307-24-4)	NR70	0.01	<0.01	NA	NA	NA	102	NA
PFHpA (375-85-9)	NR70	0.01	<0.01	NA	NA	NA	103	NA
PFOA (335-67-1)	NR70	0.01	<0.01	NA	NA	NA	92	NA
PFNA (375-95-1)	NR70	0.01	<0.01	NA	NA	NA	99	NA
PFDA (335-76-2)	NR70	0.01	<0.01	NA	NA	NA	96	NA
PFUdA (2058-94-8)	NR70	0.01	<0.01	NA	NA	NA	102	NA
PFDoA (307-55-1)	NR70	0.01	<0.01	NA	NA	NA	100	NA
PFTrDA (72629-94-8)	NR70	0.02	<0.02	NA	NA	NA	101	NA
PFTeDA (376-06-7)	NR70	0.02	<0.02	NA	NA	NA	106	NA
PFHxDA (67905-19-5)	NR70	0.02	<0.02	NA	NA	NA	100	NA
PFODA (16517-11-6)	NR70	0.05	<0.05	NA	NA	NA	95	NA
FOUEA (70887-84-2)	NR70	0.01	<0.01	NA	NA	NA	85	NA
PFBS (375-73-5)	NR70	0.01	<0.01	NA	NA	NA	103	NA
PFPeS (2706-91-4)	NR70	0.01	<0.01	NA	NA	NA	94	NA
PFHxS (355-46-4)	NR70	0.01	<0.01	NA	NA	NA	103	NA
PFHpS (375-92-8)	NR70	0.01	<0.01	NA	NA	NA	97	NA
PFOS (1763-23-1)	NR70	0.02	<0.02	NA	NA	NA	74	NA
PFNS (68259-12-1)	NR70	0.01	<0.01	NA	NA	NA	93	NA
PFDS (335-77-3)	NR70	0.01	<0.01	NA	NA	NA	90	NA
PFOSA (754-91-6)	NR70	0.01	<0.01	NA	NA	NA	104	NA
N-MeFOSA (31506-32-8)	NR70	0.02	<0.02	NA	NA	NA	122	NA
N-EtFOSA (4151-50-2)	NR70	0.02	<0.02	NA	NA	NA	102	NA
N-MeFOSAA (2355-31-9)	NR70	0.01	<0.01	NA	NA	NA	97	NA
N-EtFOSAA(2991-50-6)	NR70	0.01	<0.01	NA	NA	NA	95	NA
N-MeFOSE (24448-09-7)	NR70	0.05	<0.05	NA	NA	NA	106	NA
N-EtFOSE (1691-99-2)	NR70	0.05	<0.05	NA	NA	NA	97	NA
4:2 FTS (757124-72-4)	NR70	0.01	<0.01	NA	NA	NA	107	NA
6:2 FTS (27619-97-2)	NR70	0.01	<0.01	NA	NA	NA	89	NA
8:2 FTS (39108-34-4)	NR70	0.01	<0.01	NA	NA	NA	98	NA
10:2 FTS (120226-60-0)	NR70	0.01	<0.01	NA	NA	NA	99	NA
8:2 diPAP (678-41-1)	NR70	0.02	<0.02	NA	NA	NA	105	NA

Results expressed in percentage (%) or ug/L wherever appropriate.
Acceptable Spike recovery is 50-150%.
Maximum acceptable RPDs on spikes and duplicates is 40%.
'NA ' = Not Applicable.
RPD= Relative Percentage Difference.

Signed: [redacted]

Date:

[redacted]

REPORT OF ANALYSIS

Report No. RN1408243

Client	: [redacted]	**Job No.**	: AECO06/231011
		Quote No.	: QT-02232
		Order No.	: 60612561/2_1
		Date Received	: 11-OCT-2023
Attention	:	**Sampled By**	: CLIENT
Project Name	: NT_1200_PFASOMP_23		
Your Client Services Manager	: [redacted]	**Phone**	: [redacted]

Lab Reg No.	Sample Ref	Sample Description
N23/021398	1200_QC200_231009	WATER 09/10/2023 11:32 AM
N23/021399	1200_QC201_231009	WATER 09/10/2023 12:56 PM

Lab Reg No.		N23/021398	N23/021399			
Date Sampled		09-OCT-2023	09-OCT-2023			
	Units					Method
PFAS (per-and poly-fluoroalkyl substances)						
PFBA (375-22-4)	ug/L	<0.05	<0.05			NR70
PFPeA (2706-90-3)	ug/L	<0.02	0.021			NR70
PFHxA (307-24-4)	ug/L	<0.01	0.015			NR70
PFHpA (375-85-9)	ug/L	<0.01	<0.01			NR70
PFOA (335-67-1)	ug/L	<0.01	<0.01			NR70
PFNA (375-95-1)	ug/L	<0.01	<0.01			NR70
PFDA (335-76-2)	ug/L	<0.01	<0.01			NR70
PFUdA (2058-94-8)	ug/L	<0.01	<0.01			NR70
PFDoA (307-55-1)	ug/L	<0.01	<0.01			NR70
PFTrDA (72629-94-8)	ug/L	<0.02	<0.02			NR70
PFTeDA (376-06-7)	ug/L	<0.02	<0.02			NR70
PFHxDA (67905-19-5)	ug/L	<0.02	<0.02			NR70
PFODA (16517-11-6)	ug/L	<0.05	<0.05			NR70
FOUEA (70887-84-2)	ug/L	<0.01	<0.01			NR70
PFDS (335-77-3)	ug/L	<0.01	<0.01			NR70
PFPeS (2706-91-4)	ug/L	<0.01	<0.01			NR70
PFHxS (355-46-4)	ug/L	0.029	0.016			NR70
PFHpS (375-92-8)	ug/L	<0.01	<0.01			NR70
PFOS (1763-23-1)	ug/L	0.026	0.035			NR70
PFNS (68259-12-1)	ug/L	<0.01	<0.01			NR70
PFBS (375-73-5)	ug/L	<0.01	<0.01			NR70
PFOSA (754-91-6)	ug/L	<0.01	<0.01			NR70
N-MeFOSA (31506-32-8)	ug/L	<0.02	<0.02			NR70
N-EtFOSA (4151-50-2)	ug/L	<0.02	<0.02			NR70
N-MeFOSAA (2355-31-9)	ug/L	<0.01	<0.01			NR70
N-EtFOSAA(2991-50-6)	ug/L	<0.01	<0.01			NR70
N-MeFOSE (24448-09-7)	ug/L	<0.05	<0.05			NR70
N-EtFOSE (1691-99-2)	ug/L	<0.05	<0.05			NR70
4:2 FTS (757124-72-4)	ug/L	<0.01	<0.01			NR70

REPORT OF ANALYSIS

Lab Reg No.		N23/021398	N23/021399			
Date Sampled		09-OCT-2023	09-OCT-2023			
	Units					Method
PFAS (per-and poly-fluoroalkyl substances)						
6:2 FTS (27619-97-2)	ug/L	<0.01	<0.01			NR70
8:2 FTS (39108-34-4)	ug/L	<0.01	<0.01			NR70
10:2 FTS (120226-60-0)	ug/L	<0.01	<0.01			NR70
8:2 diPAP (678-41-1)	ug/L	<0.02	<0.02			NR70
PFBA (Surrogate Recovery)	%	94	79			NR70
PFPeA (Surrogate Recovery)	%	97	79			NR70
PFHxA (Surrogate Recovery)	%	79	77			NR70
PFHpA (Surrogate Recovery)	%	79	74			NR70
PFOA (Surrogate Recovery)	%	91	81			NR70
PFNA (Surrogate Recovery)	%	107	72			NR70
PFDA (Surrogate Recovery)	%	94	71			NR70
PFUdA (Surrogate Recovery)	%	105	75			NR70
PFDoA (Surrogate Recovery)	%	93	63			NR70
PFTeDA (Surrogate Recovery)	%	100	66			NR70
PFHxDA (Surrogate Recovery)	%	79	80			NR70
FOUEA (Surrogate Recovery)	%	112	91			NR70
PFBS (Surrogate Recovery)	%	90	78			NR70
PFHxS (Surrogate Recovery)	%	95	81			NR70
PFOS (Surrogate Recovery)	%	91	77			NR70
PFOSA (Surrogate Recovery)	%	94	62			NR70
N-MeFOSA (Surrogate Recovery)	%	61	53			NR70
N-EtFOSA (Surrogate Recovery)	%	74	64			NR70
N-MeFOSAA (Surrogate Recovery)	%	101	66			NR70
N-EtFOSAA (Surrogate Recovery)	%	111	66			NR70
N-MeFOSE (Surrogate Recovery)	%	68	62			NR70
N-EtFOSE (Surrogate Recovery)	%	79	67			NR70
4:2 FTS (Surrogate Recovery)	%	126	92			NR70
6:2 FTS (Surrogate Recovery)	%	169	88			NR70
8:2 FTS (Surrogate Recovery)	%	141	60			NR70
8:2 diPAP (Surrogate Recovery)	%	160	56			NR70
Dates						
Date extracted		13-OCT-2023	13-OCT-2023			
Date analysed		16-OCT-2023	16-OCT-2023			

N23/021398
To
N23/021399

PFOS and PFHxS are quantified using a combined branched and linear standard,

[redacted]

linear and branched isomers are totalled for reporting.
All results corrected for labelled surrogate recoveries.

Selected PFAS surrogate recoveries are biased due to matrix effects.
High PFAS surrogate recoveries accepted - results corrected for recovery.

[redacted]

18-OCT-2023

NATA
WORLD RECOGNISED
ACCREDITATION

Accredited for compliance with ISO/IEC 17025 - Testing.
This report shall not be reproduced except in full.
Results relate only to the sample(s) as received and tested.

This Report supersedes reports: *RN1408224*

Measurement Uncertainty is available upon request.

Note: Sampling date(s) have been provided by the client.
The testing was undertaken at: [redacted]

Appendix E

Data Validation Reports

DATA VALIDATION REPORT

Project Manager:	[redacted]	**Validation by:**	[redacted]
Project number:	60612561	**Date:**	19/10/2023
Site:	1200 - Robertson Barracks		
Matrix:	Water	**Data Verified by:**	[redacted]
Laboratory:	ALS and NMI Sydney	**Date:**	22/11//2023
Lab reference:	ES2334612, RN1408243		

Key Findings:
The groundwater analytical data can be used as a basis for interpretation, subject to the limitations outlined below:

- The potential exists for concentrations of PFOS to be below the LOR (0.01 µg/L), but above the PFAS Freshwater 99% Species Protection guideline (0.00023 µg/L) in samples MW012, MW012D, MW018, MW021, MW021D, MW024, MW029, MW031, MW112, MW113 and should be taken into consideration when interpreting results.

Component		Outliers			Material impact on interpretation
		No	Yes	Comment	
Frequency of field quality assurance/quality control (QAQC)		✓			No
Number of tests requested/reported		✓			No
Sample handling/preservation/holding times			✓	1	No
Frequency of laboratory QA/QC			✓	2	No
Limits of reporting (LOR)			✓	3	No
Blank analysis	Field blank	✓			No
	Rinsate blank	✓			No
	Trip blank	✓			No
	Method blank	✓			No
Field intra-laboratory relative percent differences (RPDs)		✓			No
Field inter-laboratory RPDs		✓			No
Laboratory duplicate RPDs		✓			No
Matrix spike (MS) % recoveries		✓			No
Laboratory control spike (LCS) % recoveries		✓			No
Surrogate % recoveries		✓			No
Other observations		✓			N/A

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Comments	
1. Sample handling/preservation/ holding times	Sample receipt temperature (16.8°C) upon arrival at Darwin ALS dispatch office from the field was outside of the recommended range (≤6°C) in primary batch ES2334612. Potential under reporting must be taken into consideration. However, as the samples were received below ambient groundwater temperature at the time of sampling (approximately 30 °C), the samples were immediately cooled upon collection and were received below the recommended range upon arrival at the primary and secondary laboratories, the potential for under reporting is not considered to materially affect the interpretation of results.
2. Frequency of laboratory QAQC	Laboratory duplicate samples were not reported at the required frequency for PFAS in primary batch ES2334612. The precision of the data can be assessed as acceptable based on intra- and inter-laboratory duplicate RPDs (which were reported at the required frequencies and within control limits), and available laboratory duplicate RPDs (which were reported within control limits). Matrix spikes were not reported at the required frequencies for PFAS method group in primary batch ES2334612. The accuracy of the data can be assessed as acceptable based on method blanks, LCS and surrogate spike recoveries (which were reported at the required frequencies and within control limits), and available matrix spike recoveries for the same analytical method group (which were reported within control limits).
3. Limits of Reporting (LOR)	Limits of reporting were sufficiently low to enable assessment against adopted guideline criteria, with the exception of PFOS in water. The potential exists for PFOS to be above the adopted PFAS Freshwater 99% Species Protection guideline (0.00023 µg/L), but below the laboratory LOR (0.01 µg/L) for the October 2023 groundwater results. This should be taken into consideration when interpreting PFOS results against guidelines where results are reported below the LOR, specifically at monitoring wells MW012, MW012D, MW018, MW021, MW021D, MW024, MW029, MW031, MW112, MW113.

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Data Validation Report
Field RPDs
PFAS Ongoing Monitoring Plan
Department of Defence - Roberston Barracks

Relative Percentage Differences

AECOM

	Lab Report Number	ES2334612	ES2334612		ES2334612	ES2334612		ES2334612	RN1408243		ES2334612	RN1408243	
	Field ID	1200_MW001_231009	1200_QC100_231009	RPD	1200_MW034_231009	1200_QC101_231009	RPD	1200_MW001_231009	1200_QC200_231009	RPD	1200_MW034_231009	1200_QC201_231009	RPD
	Sampled Date	9/10/2023	9/10/2023		9/10/2023	9/10/2023		9/10/2023	9/10/2023		9/10/2023	9/10/2023	
	Sampled Date	Primary	Intra-lab Duplicate		Primary	Intra-lab Duplicate		Primary	Inter-lab Duplicate		Primary	Inter-lab Duplicate	
Analyte	**Units**	**LOR**											
PFAS Full Suite													
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	µg/L	0.05 : 0.01 (Interlab)	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.01	0	<0.05	<0.01	0
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	µg/L	0.05 : 0.01 (Interlab)	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.01	0	<0.05	<0.01	0
6:2 Fluorotelomer Sulfonate (6:2 FtS)	µg/L	0.05 : 0.01 (Interlab)	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.01	0	<0.05	<0.01	0
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	µg/L	0.05 : 0.01 (Interlab)	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.01	0	<0.05	<0.01	0
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	µg/L	0.05 : 0.02 (Interlab)	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.02	0	<0.05	<0.02	0
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	µg/L	0.02 : 0.01 (Interlab)	<0.02	<0.02	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.01	0
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	µg/L	0.05	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0
N-Methyl perfluorooctane sulfonamide (MeFOSA)	µg/L	0.05 : 0.02 (Interlab)	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.02	0	<0.05	<0.02	0
N-Methyl perfluorooctane sulfonamidoacetic acid (MFOSAA)	µg/L	0.02 : 0.01 (Interlab)	<0.02	<0.02	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.01	0
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	µg/L	0.05	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0
Perfluorobutane sulfonic acid (PFBS)	µg/L	0.02 : 0.01 (Interlab)	<0.02	<0.02	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.01	0
Perfluorobutanoic acid (PFBA)	µg/L	0.1 : 0.05 (Interlab)	<0.1	<0.1	0	<0.1	<0.1	0	<0.1	<0.05	0	<0.1	<0.05	0
Perfluorodecanesulfonic acid (PFDS)	µg/L	0.02 : 0.01 (Interlab)	<0.02	<0.02	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.01	0
Perfluorodecanoic acid (PFDA)	µg/L	0.02 : 0.01 (Interlab)	<0.02	<0.02	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.01	0
Perfluorododecanoic acid (PFDoDA)	µg/L	0.02 : 0.01 (Interlab)	<0.02	<0.02	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.01	0
Perfluoroheptane sulfonic acid (PFHpS)	µg/L	0.02 : 0.01 (Interlab)	<0.02	<0.02	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.01	0
Perfluoroheptanoic acid (PFHpA)	µg/L	0.02 : 0.01 (Interlab)	<0.02	<0.02	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.01	0
Perfluorohexanoic acid (PFHxA)	µg/L	0.02 : 0.01 (Interlab)	<0.02	<0.02	0	0.04	0.04	0	<0.02	<0.01	0	0.04	0.015	91
Perfluorononanoic acid (PFNA)	µg/L	0.02 : 0.01 (Interlab)	<0.02	<0.02	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.01	0
Perfluorooctane sulfonamide (FOSA)	µg/L	0.02 : 0.01 (Interlab)	<0.02	<0.02	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.01	0
Perfluoropentane sulfonic acid (PFPeS)	µg/L	0.02 : 0.01 (Interlab)	<0.02	<0.02	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.01	0
Perfluoropentanoic acid (PFPeA)	µg/L	0.02	<0.02	<0.02	0	0.04	0.04	0	<0.02	<0.02	0	0.04	0.021	62
Perfluorotetradecanoic acid (PFTeDA)	µg/L	0.05 : 0.02 (Interlab)	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.02	0	<0.05	<0.02	0
Perfluorotridecanoic acid (PFTrDA)	µg/L	0.02	<0.02	<0.02	0	<0.02	<0.02	0	<0.02	<0.02	0	<0.02	<0.02	0
Perfluoroundecanoic acid (PFUnDA)	µg/L	0.02 : 0.01 (Interlab)	<0.02	<0.02	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.01	0
Perfluorooctane sulfonic acid (PFOS)	µg/L	0.01 : 0.02 (Interlab)	0.09	0.1	11	0.1	0.12	18	0.09	0.026	110	0.1	0.035	96
Perfluorooctanoic Acid (PFOA)	µg/L	0.01	<0.01	<0.01	0	<0.01	<0.01	0	<0.01	<0.01	0	<0.01	<0.01	0
Perfluorohexane sulfonic acid (PFHxS)	µg/L	0.01	0.04	0.04	0	0.03	0.03	0	0.04	0.029	32	0.03	0.016	61

*RPDs have only been considered where a concentration is greater than 1 times the LOR.
**High RPDs are in bold (Acceptable RPDs for each LOR multiplier range are: 200 (1-10 x LOR); 50 (10-20 x LOR); 30 (> 20 x LOR))
***Interlab Duplicates are matched on a per compound basis as methods vary between laboratories. Any methods in the row header relate to those used in the primary laboratory

QAQC Blanks

Lab Report Number	ES2334612	ES2334612	ES2334612	ES2334612	ES2334612
Field ID	1200_QC400_231006	1200_QC401_231009	1200_QC300_231006	1200_QC301_231009	1200_QC500_231006
Sampled Date	9/10/2023	9/10/2023	9/10/2023	9/10/2023	9/10/2023
Sample Type	Field Blank	Field Blank	Rinsate	Rinsate	Trip Blank

Analyte	Units	LOR					
PFAS Full Suite							
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	µg/L	0.05	<0.05	<0.05	<0.05	<0.05	<0.05
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	µg/L	0.05	<0.05	<0.05	<0.05	<0.05	<0.05
6:2 Fluorotelomer Sulfonate (6:2 FtS)	µg/L	0.05	<0.05	<0.05	<0.05	<0.05	<0.05
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	µg/L	0.05	<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	µg/L	0.05	<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	µg/L	0.02	<0.02	<0.02	<0.02	<0.02	<0.02
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	µg/L	0.05	<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamide (MeFOSA)	µg/L	0.05	<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoacetic acid (MFOSAA)	µg/L	0.02	<0.02	<0.02	<0.02	<0.02	<0.02
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	µg/L	0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Perfluorobutane sulfonic acid (PFBS)	µg/L	0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorobutanoic acid (PFBA)	µg/L	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Perfluorodecanesulfonic acid (PFDS)	µg/L	0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorodecanoic acid (PFDA)	µg/L	0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorododecanoic acid (PFDoDA)	µg/L	0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroheptane sulfonic acid (PFHpS)	µg/L	0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroheptanoic acid (PFHpA)	µg/L	0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorohexanoic acid (PFHxA)	µg/L	0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorononanoic acid (PFNA)	µg/L	0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorooctane sulfonamide (FOSA)	µg/L	0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoropentane sulfonic acid (PFPeS)	µg/L	0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoropentanoic acid (PFPeA)	µg/L	0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotetradecanoic acid (PFTeDA)	µg/L	0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Perfluorotridecanoic acid (PFTrDA)	µg/L	0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroundecanoic acid (PFUnDA)	µg/L	0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Sum of PFAS	µg/L	0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Sum of PFHxS and PFOS	µg/L	0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Perfluorooctane sulfonic acid (PFOS)	µg/L	0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Perfluorooctanoic Acid (PFOA)	µg/L	0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Perfluorohexane sulfonic acid (PFHxS)	µg/L	0.01	<0.01	<0.01	<0.01	<0.01	<0.01

APPENDIX C: TABLES

Table C1 – Groundwater Gauging and Field Parameters

Table C2 – Groundwater Analytical Results

Table C3 – Surface Water Gauging and Field Parameters

Table C4 – Surface Water Analytical Results

Location	Location Code	Date	Depth to Water (mbTOC)	Well Depth (mbTOC)	TOC (mAHD)	Water Elevation (mAHD)	Condition of Gatic	DO (mg/L)	EC (µS/cm)	TDS (calc) (mg/L)	pH	Eh (mV)	Redox (corr)(mV)	Temp (°C)	Turbidity	Water Colour	Odour	Sheen	Sample Method
Southern Bores	MW001	18/12/2019	-	-	-	-	Good	Insufficent water to sample											
		7/04/2020	-	-	-	-	Good	19.00	51.2	33.3	5.75	170.6	370.6	30.1	Clear	Clear	No odour	No sheen	Hydrasleeve
		4/11/2020	2.455	8.30	24.37	21.92	Good	0.25	46.7	30.4	4.74	397.6	597.6	29.1	Clear	Light Brown	Odourless	No sheen	Hydrasleeve
		15/04/2021	1.167	-	24.37	23.20	Good	0.89	46.5	30.2	5.58	141.6	341.6	30.6	Cloudy	Grey	Odourless	No Sheen	Hydrasleeve
		3/11/2021	2.862	8.20	24.37	21.51	Good	0.84	100.7	65.5	4.44	172.9	372.9	28.9	Medium	Orange / Brown	Odourless	No sheen	Hydrasleeve
		22/04/2022	1.171	8.15	24.37	23.20	Good	4.42	80.9	52.6	4.59	115.3	315.3	30.5	Low	Light brown	Odourless	No sheen	Hydrasleeve
		20/09/2022	2.680	7.95	24.37	21.69	Good	1.51	47.0	30.6	4.89	136.0	336.0	29	Moderate, silty at bottom of hydrasleeve		Odourless	No sheen	Hydrasleeve
		22/03/2023	1.110	7.88	24.37	23.26	Good	1.03	70.1	45.6	5.53	37.5	237.5	29.2	Low	Light brown	Odourless	No sheen	Hydrasleeve
		5/10/2023	2.714	7.88	24.37	21.66	Good	2.73	34.8	20.9	4.72	165.5	365.5	28.9	Low	Light brown	Odourless	No sheen	Hydrasleeve
		6/03/2024	1.149	7.84	24.37	23.22	Good	0.82	53.2	31.9	5.05	94.6	294.6	27.1	Moderate	Pale brown	Odourless	No sheen	Hydrasleeve
Source Area 2 and 3	MW004	9/04/2019	2.594	3.23	26.78	24.19	-	0.26	58.5	38.0	5.02	3.8	203.8	32	Clear	Clear	No odour	No sheen	Hydrasleeve
		8/10/2019		3.22	26.78	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		18/12/2019	-	-	26.78	-	Good	Insufficent water to sample											
	MW005*	18/12/2019	4.380	7.60	26.25	21.87	Good	0.53	34.8	22.6	5.01	305.8	505.8	31.5	Low	Clear	No odour	No Sheen	Hydrasleeve
	MW004	7/04/2020	3.140	8.00	26.78	23.64	Good	Insufficent water to sample											
	MW005*	7/04/2020	2.709	7.70	26.25	23.54	Good	0.80	29.0	18.9	5.16	219.6	419.6	30.5	Low	Clear	No odour	No Sheen	Hydrasleeve
	MW004	4/11/2020	4.778	8.37	26.78	22.00	Good	0.66	130.9	85.1	5.65	262.8	462.8	30.7	Turbid	Brown	Slight Organic	No Sheen	Hydrasleeve
		15/04/2021	2.874	3.03	26.78	23.91	Good	0.14	814.0	529.1	6.58	-155.4	44.6	32.3	Cloudy	Grey	Odourless	No Sheen	Hydrasleeve
		3/11/2021	5.500	8.35	26.78	21.28	Good	0.44	489.3	318.0	4.50	-52.3	147.7	31.3	Turbid	Orange / Brown	Organic Odour	No Sheen	Hydrasleeve
		22/04/2022	2.912	8.28	26.78	23.87	Good	1.37	92.5	60.1	4.75	115.2	315.2	32.9	Low	Slight yellow	ht Hydrogen Sulphide Od	No Sheen	Hydrasleeve
		19/09/2022	4.965	8.27	26.78	21.82	Impacted with roots	Root impaction - unable to sample											
		20/03/2023	2.844	4.10	26.78	23.94	Impacted with roots	0.62	45.8	29.8	4.71	121.2	321.2	29.8	High	Pale brown	Odourless	No sheen	Hydrasleeve
		5/10/2023	-	-	-	-	Impacted with roots	Root impaction - unable to sample											
		29/02/2024	2.838	8.11	-	-	Good	1.23	73.0	43.8	5.18	98.2	298.2	33.9	Low	Colourless	Odourless	No sheen	Hydrasleeve
Source Area 2 and 3	MW004D	18/12/2019	4.791	32.00	26.78	21.99	Good	0.82	370.1	240.6	6.55	177.9	377.9	32.4	Low	Clear	No odour	No Sheen	Hydrasleeve
		7/04/2020	3.091	30.80	26.78	23.69	Good	0.47	6.6	4.3	6.64	26.4	226.4	31.4	Clear	Brown	No odour	No Sheen	Hydrasleeve
		4/11/2020	5.700	-	26.78	21.08	Good	1.22	391.5	254.5	6.52	268.3	468.3	31.7	Clear	Colourless	Odourless	No Sheen	Hydrasleeve
		15/04/2021	2.808	31.28	26.78	23.97	Good	0.71	367.5	238.9	6.71	-60.1	139.9	31.8	Clear	Colourless	Odourless	No Sheen	Hydrasleeve
		3/11/2021	5.500	31.80	26.78	21.28	Good	0.87	371.6	241.5	5.10	-56.8	143.2	31.1	Medium	Orange / Brown	Hydrogen Sulphide odou	No Sheen	Hydrasleeve
		22/04/2022	2.848	31.30	26.78	23.93	Good	3.92	354.2	230.2	6.51	-0.9	199.1	31.5	Low	Grey	Hydrogen Sulphide odou	No Sheen	Hydrasleeve
		20/09/2022	4.955	31.23	26.78	21.83	Good	1.69	341.4	221.9	6.71	-42.3	157.7	30.7	Low	Light brown	Odourless	No sheen	Hydrasleeve
		20/03/2023	2.795	31.10	26.78	23.99	Good	1.17	359.0	233.4	6.68	-11.0	189.0	30.6	Low	Light brown	Odourless	No sheen	Hydrasleeve
		5/10/2023	5.246	31.10	26.78	21.53	Good	1.50	316.2	189.7	6.39	-95.8	104.2	29.2	Low	Light brown	Odourless	No sheen	Hydrasleeve
		29/02/2024	2.755	29.81	26.78	24.03	Good	1.91	335.8	201.5	6.67	4.3	204.3	32.9	Low	Colourless	Odourless	No sheen	Hydrasleeve
Source Area 1	MW012	18/12/2019	5.115	10.08	30.65	25.54	-	0.36	38.6	25.1	4.99	189.0	389.0	32.6	Low	Clear	Odourless	No Sheen	Hydrasleeve
		7/04/2020	3.861	10.08	30.65	26.79	Good	0.75	54.6	35.5	5.52	93.4	293.4	32.3	Clear	Clear	Odourless	No Sheen	Hydrasleeve
		4/11/2020	5.919	8.75	30.65	24.73	Good	0.81	43.5	28.3	5.17	375.2	575.2	32	Clear	Colourless	Odourless	No Sheen	Hydrasleeve
		15/04/2021	3.413	10.08	30.65	27.24	Good	0.85	56.8	36.9	5.53	98.5	298.5	32.6	Clear	Colourless	Odourless	No Sheen	Hydrasleeve
		2/11/2021	6.161	10.67	30.65	24.49	Good	1.75	36.9	24.0	4.73	213.2	413.2	30.3	Low	Orange / Brown	Odourless	No Sheen	Hydrasleeve
		22/04/2022	3.372	-	30.65	27.28	Good	3.16	73.4	47.7	4.96	102.7	302.7	32	Low	ss, orange suspend	Odourless	No sheen	Hydrasleeve
		20/09/2022	8.420	10.70	30.65	22.23	Good	1.56	32.3	21.0	4.74	247.6	447.6	31.9	Low	Colourless	Odourless	No Sheen	Hydrasleeve
		22/03/2023	3.160	23.55	30.65	27.49	Good	0.78	59.7	38.8	5.29	73.1	273.1	32.2	Low	Light brown	Odourless	No sheen	Hydrasleeve
		5/10/2023	7.288	23.55	30.65	23.36	Good	1.93	24.8	14.9	4.56	174.1	374.1	31.1	Moderate	Light brown	Odourless	No sheen	Hydrasleeve
		29/02/2024	3.012	23.55	30.65	27.64	Good	4.22	123.5	74.1	6.88	102.1	302.1	30.3	Low	Colourless	Odourless	No sheen	Hydrasleeve
Source Area 1	MW012D	18/12/2019	8.048	30.19	30.77	22.72	Good	0.64	52.6	34.2	5.26	200.3	400.3	33.5	Low	Light Brown	No odour	No Sheen	Hydrasleeve
		7/04/2020	2.014	30.13	30.77	28.76	Good	1.03	38.8	25.2	5.47	58.1	258.1	31.4	Clear	Clear	No odour	No Sheen	Hydrasleeve
		4/11/2020	7.942	-	30.77	22.83	Good	2.05	54.9	35.7	6.07	324.0	524.0	31.5	Clear	Colourless	Hydrogen Sulphide odou	No Sheen	Hydrasleeve
		15/04/2021	5.178	32.00	30.77	25.59	Good	0.62	47.1	30.6	6.17	91.6	291.6	31.4	Clear	Colourless	Hydrogen Sulphide odou	No Sheen	Hydrasleeve
		2/11/2021	8.438	30.70	30.77	22.33	Good	0.81	39.5	25.7	4.51	129.1	329.1	30.2	Low	Yellow / Brown	Hydrogen Sulphide odou	No Sheen	Hydrasleeve
		22/04/2022	5.083	30.75	30.77	25.69	Good	5.05	82.7	53.8	5.98	99.8	299.8	31.7	Low	Light brown	Odourless	No Sheen	Hydrasleeve
		19/09/2022	7.715	-	30.77	23.06	Good	1.69	38.8	25.2	5.05	140.0	340.0	31.1	Low	Light brown	Odourless	No sheen	Hydrasleeve
		22/03/2023	4.780	-	30.77	25.99	Good	2.25	55.2	35.9	5.18	72.8	272.8	31.8	Low	Light brown	Odourless	No sheen	Hydrasleeve
		5/10/2023	8.541	NM	30.77	22.23	Good	2.25	27.6	16.6	4.79	154.6	354.6	31.8	Low	Light brown	Odourless	No sheen	Hydrasleeve
		29/02/2024	4.612	NM	30.77	26.16	Good	4.18	132.0	79.2	6.92	131.2	331.2	30.4	Low	Light brown	Odourless	No sheen	Hydrasleeve

Location	Location Code	Date	Depth to Water (mbTOC)	Well Depth (mbTOC)	TOC (mAHD)	Water Elevation (mAHD)	Condition of Gatic	DO (mg/L)	EC (µS/cm)	TDS (calc) (mg/L)	pH	Eh (mV)	Redox (corr)(mV)	Temp (°C)	Turbidity	Water Colour	Odour	Sheen	Sample Method
Source Area 2 and 3	MW018	18/12/2019	4.140	8.72	25.57	21.43	Good	0.79	35.1	22.8	4.88	266.5	466.5	31.7	Low	Clear	Odourless	No Sheen	Hydrasleeve
		6/04/2020	2.785	8.04	25.57	22.79	Good	1.80	64.6	42.0	5.24	244.3	444.3	29.9	Clear	Clear	Odourless	No Sheen	Hydrasleeve
		4/11/2020	4.001	6.93	25.57	21.57	Good	1.03	39.3	25.5	5.06	382.3	582.3	30.8	Clear	Colourless	Odourless	No Sheen	Hydrasleeve
		15/04/2021	2.536	8.72	25.57	23.03	Good	1.30	43.2	28.1	5.53	155.5	355.5	30.6	Clear	Colourless	Odourless	No Sheen	Hydrasleeve
		2/11/2021	4.588	8.72	25.57	20.98	Good	0.70	41.4	26.9	4.01	218.2	418.2	30	Low	Orange / Brown	Odourless	No Sheen	Hydrasleeve
		22/04/2022	2.615	8.71	25.57	22.96	Good	8.34	301.3	195.8	5.69	74.2	274.2	31.1	Low	Light brown	Odourless	No Sheen	Hydrasleeve
		20/09/2022	4.525	8.68	25.57	21.05	Good	2.32	39.9	25.9	5.03	141.1	341.1	30	Moderate		Odourless	No sheen	Hydrasleeve
		22/03/2023	2.490	8.73	25.57	23.08	Good	1.99	65.7	42.7	5.53	67.7	267.7	30.3	Low	Light brown	Odourless	No sheen	Hydrasleeve
		6/10/2023	4.172	8.73	25.57	21.40	Good	1.32	74.1	44.5	4.80	103.4	303.4	30.5	Low	Light brown	Odourless	No sheen	Hydrasleeve
		1/03/2024	2.400	8.72	25.57	23.17	Good	-	61.7	37.0	6.95	9.8	209.8	30.3	Moderate	Brown	Odourless	No sheen	Hydrasleeve
Source Area 1	MW021	18/12/2019	2.600	8.71	18.03	15.43	Good	0.48	41.7	27.1	4.71	256.4	456.4	32.5	Low	Clear	Odourless	No Sheen	Hydrasleeve
		6/04/2020	2.218	7.99	18.03	15.81	Good	0.77	76.1	49.5	5.65	88.0	288.0	30.6	Clear	Clear	Hydrogen Sulfide odour	No Sheen	Hydrasleeve
		4/11/2020	2.532	7.12	18.03	15.50	Good	2.33	81.1	52.7	7.81	384.4	584.4	30.3	Clear	Colourless	Odourless	No Sheen	Hydrasleeve
		15/04/2021	2.948	8.47	18.03	15.08	Good	0.86	63.6	41.3	5.19	175.2	375.2	30.8	Clear	Colourless	Odourless	No Sheen	Hydrasleeve
		2/11/2021	3.409	8.72	18.03	14.62	Good	2.28	43.7	28.4	4.24	199.2	399.2	30.4	Medium	Orange / Brown	Organic odour	No Sheen	Hydrasleeve
		22/04/2022	2.226	8.72	18.03	15.80	Good	5.75	112.6	73.2	5.09	100.2	300.2	29.7	Low	Light brown	Odourless	No Sheen	Hydrasleeve
		20/09/2022	2.822	8.71	18.03	15.21	Good	3.16	68.0	44.2	4.89	129.6	329.6	29.2	Moderate	Light brown	Odourless	No sheen	Hydrasleeve
		22/03/2023	2.002		18.03	16.03	Good	2.28	100.2	65.1	5.95	68.3	268.3	28.6	Low	Light brown	Odourless	No sheen	Hydrasleeve
		6/10/2023	2.676	NM	18.03	18.03	Good	1.46	35.7	21.4	4.34	266.0	466.0	29.2	Low	Light brown	Odourless	No sheen	Hydrasleeve
		1/03/2024	2.331	8.73	18.03	18.03	Good	-	35.8	21.5	6.40	116.1	316.1	30.3	Low	Light brown	Odourless	No sheen	Hydrasleeve
Source Area 1	MW021D	18/12/2019	2.710	30.74	17.99	15.28	Good	0.54	148.3	96.4	5.91	217.2	417.2	32.3	Low	Light Brown	Odourless	No Sheen	Hydrasleeve
		6/04/2020	5.705	30.19	17.99	12.29	Good	1.17	139.6	90.7	6.11	169.4	369.4	30.2	Clear	Grey	Odourless	No Sheen	Hydrasleeve
		4/11/2020	2.741		17.99	15.25	Good	0.83	157.9	102.6	6.46	380.2	580.2	30.1	Clear	Colourless	Odourless	No Sheen	Hydrasleeve
		15/04/2021	2.219	31.18	17.99	15.77	Good	1.08	144.3	93.8	5.95	135.1	335.1	29.8	Turbid	Red	Odourless	No Sheen	Hydrasleeve
		2/11/2021	3.299	31.10	17.99	14.69	Good	0.86	142.8	92.8	4.57	131.2	331.2	30.3	Medium	Orange / Brown	Organic odour	No Sheen	Hydrasleeve
		22/04/2022	1.950	30.90	17.99	16.04	Good	3.04	179.6	116.7	5.94	60.9	260.9	30	Low	Light brown	Odourless	No Sheen	Hydrasleeve
		20/09/2022	3.242	30.94	17.99	14.75	Good	2.19	150.1	97.6	5.54	188.8	388.8	29.5	Moderate		Odourless	No sheen	Hydrasleeve
		22/03/2023	1.905	30.62	17.99	16.09	Good	2.32	151.2	98.3	6.07	70.8	270.8	28.4	Low	Light brown	Odourless	No sheen	Hydrasleeve
		6/10/2023	8.541	30.62	17.99	9.45	Good	2.68	146.0	87.6	5.55	187.3	387.3	30	Low	Light brown	Odourless	No sheen	Hydrasleeve
		1/03/2024	1.907	30.61	17.99	16.08	Good	-	129.1	77.5	6.53	76.1	276.1	31.7	Low	Colourless	Odourless	No sheen	Hydrasleeve
Northern Bores	MW023	7/04/2020	-	5.03	12.16	-	Good	Dry											
		4/11/2020	-	-	12.16	-	Good	Dry											
		15/04/2021	5.655	6.75	12.16	6.51	Good	1.26	166.8	108.4	6.06	114.7	314.7	30.4	Clear	Light brown	Odourless	No Sheen	Hydrasleeve
		3/11/2021	-	-	12.16	-	Good	Dry, MW024 sampled as alternate well.											
	MW024*	3/11/2021	3.425	8.93	6.34	2.92	Good	1.54	1902.0	1236.3	4.51	148.7	348.7	32.1	Turbid	Yellow/Brown	Odourless	No Sheen	Hydrasleeve
	MW023	21/04/2022	-	-	12.16	-	Well head damaged	Unable to sample, MW024 sampled as alternate well.											
	MW024*	22/04/2022	1.488	8.95	6.34	4.85	Good	3.54	693.0	450.5	5.84	75.2	275.2	30.3	Low	Light brown	Odourless	No Sheen	Hydrasleeve
	MW023	20/09/2022	6.712	6.84	12.16	5.45	Good	Dry, MW024 sampled as alternate well.											
	MW024*	21/09/2022	2.458	8.92	6.34	3.88	Good	2.21	148.3	96.4	6.09	-37.6	162.4	30.8	Moderate	Orange/brown	Odourless	No Sheen	Hydrasleeve
	MW023	22/03/2023	5.865	6.86	-	-	New TOC	Insufficient water to collect parameters											
	MW023	6/10/2023	-	-	-	-	Good	Sampling location dry - unable to sample											
		1/03/2024	5.925	8.55	-	-	Good	-	94.9	56.9	6.31	120.0	320.0	31.8	Low	Brown	Odourless	No sheen	Hydrasleeve
	MW024^	6/10/2023	2.322	6.86	3.88	1.56	Good	1.54	15838.0	9502.8	6.05	69.8	269.8	631.3	Moderate	Brown	Odourless	No sheen	Hydrasleeve
Southern Bores	MW029	18/12/2019	2.920	7.42	25.436	22.52	Good	0.88	48.2	31.3	5.35	173.8	373.8	31.9	Medium	Light Brown	Odourless	No sheen	Hydrasleeve
		6/04/2020	0.714	5.31	25.436	24.72	Good	9.50	59.6	38.7	5.70	107.2	307.2	31.2	Medium	Grey	-	No sheen	Hydrasleeve
		4/11/2020	2.872	4.45	25.436	22.56	Good	0.00	73.4	47.7	5.75	273.7	473.7	31.9	Clear	Light Brown	Odourless	No sheen	Hydrasleeve
		15/04/2021	1.676	7.80	25.436	23.76	Good	0.50	53.0	34.5	6.34	73.1	273.1	29.6	Turbid	Brown	Odourless	No sheen	Hydrasleeve
		2/11/2021	2.997	7.82	25.436	22.44	Good	1.28	51.1	33.2	4.08	137.7	337.7	31.4	Turbid	Orange / Brown	Slight Organic odour	No sheen	Hydrasleeve
		22/04/2022	1.714	7.76	25.436	23.72	Good	4.16	301.4	195.9	5.82	-1.4	198.6	30.6	Low	Light brown	Odourless	No sheen	Hydrasleeve
		20/09/2022	3.270	7.69	25.436	22.17	Good	1.28	33.7	21.9	5.53	94.8	294.8	31.6	High	Light brown	Hydrogen Sulfide odour	No sheen	Hydrasleeve
		22/03/2023	0.590	7.54	25.436	24.85	Good	0.88	68.4	44.5	5.45	58.0	258.0	30.8	Low	Light brown	Odourless	No sheen	Hydrasleeve
		5/10/2023	3.543	7.54	25.436	21.89	Good	1.34	42.5	25.5	4.84	113.7	313.7	31.4	Moderate	Light brown	Odourless	No sheen	Hydrasleeve
		29/03/2024	1.677	7.54	25.436	23.76	Good	3.59	37.9	22.7	5.31	71.8	271.8	30.9	Moderate	Brown	Odourless	No sheen	Hydrasleeve
Southern Bores	MW030	18/12/2019	2.160	7.27	23.33	21.17	Good	1.16	39.0	25.4	4.99	263.6	463.6	29.3	Low	Light Brown	Odourless	No sheen	Hydrasleeve
		6/04/2020	0.876	8.17	23.33	22.45	Good	10.50	35.6	23.1	5.17	202.2	402.2	29.7	Clear	Clear	Odourless	No sheen	Hydrasleeve
		4/11/2020	2.049	5.54	23.33	21.28	Good	0.42	71.0	46.2	5.68	280.1	480.1	28.9	Turbid	Brown	Slight Organic odour	No sheen	Hydrasleeve
		15/04/2021	0.080	7.17	23.33	23.25	Good	0.60	40.3	26.2	6.73	182.7	382.7	29.8	Cloudy	Colourless	Odourless	No sheen	Hydrasleeve
		2/11/2021	2.490	7.16	23.33	20.84	Good	1.85	44.0	28.6	3.81	168.2	368.2	29.8	Turbid	Yellow / Brown	Organic odour	No sheen	Hydrasleeve
		22/04/2022	0.809	7.14	23.33	22.52	Good	6.66	463.6	301.3	6.45	5.4	205.4	28.9	Moderate	Light brown	Odourless	No sheen	Hydrasleeve
		20/09/2022	2.285	7.06	23.33	21.05	Good	2.19	37.8	24.6	5.12	146.0	346.0	29	High	Orange/brown	Odourless	No sheen	Hydrasleeve
		22/03/2023	0.745	7.03	23.33	22.59	Good	1.97	56.6	36.8	5.00	75.7	275.7	29.3	Low	Light brown	Odourless	No sheen	Hydrasleeve
		5/10/2023	3.305	7.03	23.33	20.03	Good	Field parameters and observations not saved - electronic data error											Hydrasleeve
		29/03/2024	0.746	7.03	23.33	22.58	Good	2.95	31.3	18.8	4.89	59.7	259.7	29.6	Moderate	Brown	Odourless	No sheen	Hydrasleeve

Location	Location Code	Date	Depth to Water (mbTOC)	Well Depth (mbTOC)	TOC (mAHD)	Water Elevation (mAHD)	Condition of Gatic	DO (mg/L)	EC (µS/cm)	TDS (calc) (mg/L)	pH	Eh (mV)	Redox (corr)(mV)	Temp (°C)	Turbidity	Water Colour	Odour	Sheen	Sample Method
Source Area 2 and 3	MW031	18/12/2019	3.895	8.46	25.558	21.66	Good	0.65	42.4	27.6	4.82	247.2	447.2	31.6	Medium	Light Brown	Odourless	No sheen	Hydrasleeve
		6/04/2020	2.404	7.96	25.558	23.15	Good	7.30	268.0	174.2	6.18	-6.0	194.0	31.4	Clear	Clear	-	No sheen	Hydrasleeve
		4/11/2020	3.771	6.95	25.558	21.79	Good	0.69	73.1	47.5	5.55	308.6	508.6	31.3	Clear	Light Brown	Odourless	No sheen	Hydrasleeve
		15/04/2021	2.206	8.22	25.558	23.35	Good	0.81	42.3	27.5	5.84	122.9	322.9	29.6	Turbid	Brown	Odourless	No sheen	Hydrasleeve
		2/11/2021	4.199	8.15	25.558	21.36	Good	0.89	52.9	34.4	3.70	196.4	396.4	31.3	Turbid	Orange / Brown	Odourless	No sheen	Hydrasleve
		22/04/2022	2.264	8.06	25.558	23.29	Good	5.34	85.2	55.4	4.59	112.4	312.4	31.3	Moderate	Light brown	Odourless	No sheen	Hydrasleeve
		20/09/2022	4.015	7.94	25.558	21.54	Good	2.25	56.9	37.0	5.25	137.9	337.9	31.2	High		Odourless	No sheen	Hydrasleeve
		22/03/2023	2.200	7.67	25.558	23.36	Good	1.16	5.5	3.6	5.54	65.8	265.8	30.2	Low	Pale brown	Odourless	No sheen	Hydrasleeve
		5/10/2023	3.988	7.67	25.558	21.57	Good	1.86	32.2	19.3	3.87	188.4	388.4	30.9	Moderate	Pale brown	Odourless	No sheen	Hydrasleeve
		29/03/2024	2.152	7.67	25.558	23.41	Good	0.72	45.0	27.0	5.10	75.4	275.4	31.1	Low	Pale brown	Odourless	Organic	Hydrasleeve
Northern Bores	MW032	18/12/2019	5.677	8.81	19.862	14.19	Good	1.00	87.5	56.9	5.67	194.9	394.9	31.5	-	Clear	No odour	No sheen	Hydrasleeve
		7/04/2020	2.301	8.14	19.862	17.56	Good	1.20	32.4	21.1	5.61	258.8	458.8	32.1	Clear	Clear	No odour	No sheen	Hydrasleeve
		4/11/2020	5.258	6.95	19.862	14.60	Good	1.28	96.5	62.7	5.41	389.5	589.5	31.5	Clear	Colourless	Odourless	No sheen	Hydrasleeve
		15/04/2021	2.216	8.72	19.862	17.65	Good	0.95	29.1	18.9	6.03	129.3	329.3	30.1	Clear	Colourless	Odourless	No sheen	Hydrasleeve
		2/11/2021	5.680	8.72	19.862	14.18	Good	1.22	83.8	54.5	4.01	188.1	388.1	31.4	Medium	Orange / Brown	Odourless	No sheen	Hydrasleeve
		22/04/2022	2.162	8.68	19.862	17.70	Good	7.04	78.2	50.8	5.10	102.4	302.4	30.9	Low	Light brown	Odourless	No sheen	Hydrasleeve
		20/09/2022	5.068	8.69	19.862	14.79	Good	3.02	104.8	68.1	5.43	108.4	308.4	30.2	Moderate	Light brown	Odourless	No sheen	Hydrasleeve
		22/03/2023	1.905	8.66	19.862	17.96	Good	1.32	48.0	31.2	5.16	65.9	265.9	30.8	Low	Light brown	Odourless	No sheen	Hydrasleeve
		5/10/2023	5.344	8.66	19.862	14.52	Good	2.56	85.3	51.2	5.44	94.2	294.2	29.2	Moderate	Light brown	Odourless	No sheen	Hydrasleeve
		29/03/2024	2.011	8.66	19.862	17.85	Good	1.72	41.1	24.7	5.42	69.8	269.8	31.5	Low	Colourless	Odourless	No sheen	Hydrasleeve
Northern Bores	MW034	17/04/2019	2.643	11.30	19.5	16.86	Good	0.56	26.3	17.1	4.57	184.9	384.9	31.6	Clear	Colourless	Odourless	No sheen	Hydrasleeve
		14/10/2019	7.145	11.35	19.5	12.36	Good, tubing in bottom of well unable to retrieve	0.09	34.3	22.3	4.73	-51.1	148.9	32.9	Clear	Colourless	Hydrogen Sulfide odour	No sheen	Hydrasleeve
		14/10/2019	7.313	11.35	19.5	12.19	Good	-	-		-	-		-	-	-	-	-	-
		18/12/2019	5.115	11.47	19.5	14.39	Good	1.24	32.3	21.0	4.82	334.7	534.7	31.9	Low	Colourless	Odourless	No sheen	Hydrasleeve
		7/04/2020	2.739	12.00	19.5	16.76	Good	0.91	24.5	15.9	5.00	211.7	411.7	31.2	Low	Colourless	Odourless	No sheen	Hydrasleeve
		21/09/2020	5.976	11.40	19.5	13.52	Good	2.40	41.3	26.8	3.75	343.4	543.4	33.7	Low	Orange/Brown	Slight organic odour	No sheen	Hydrasleeve
		4/11/2020	6.799	8.83	19.5	12.70	Good	0.31	50.6	32.9	5.19	375.2	575.2	31.7	Low	Colourless	Odourless	No sheen	Hydrasleeve
		1/03/2021	2.330	11.40	19.5	17.17	Good	0.54	30.1	19.6	4.11	172.2	372.2	32.1	Low	Grey	Peutrified	No sheen	Hydrasleeve
		15/04/2021	2.552	11.47	19.5	16.95	Good	0.77	41.5	27.0	5.69	176.9	376.9	32.6	Low	Colourless	Odourless	No sheen	Hydrasleeve
		7/06/2021	4.130	11.40	19.5	15.37	Good	1.51	52.7	34.3	6.99	110.0	310.0	28.3	Low	Colourless	Odourless	No sheen	Hydrasleeve
		2/11/2021	5.209	11.40	19.5	14.29	Good	1.91	87.9	57.1	5.33	162.5	362.5	28.6	Low	Colourless	Odourless	No sheen	Hydrasleeve
		22/04/2022	2.486	11.49	19.5	17.01	Good	2.10	82.5	53.6	4.57	128.4	328.4	31.2	Low	Colourless	Slight organic odour	No sheen	Hydrasleeve
		20/09/2022	5.932	11.51	19.5	13.57	Good	1.34	33.6	21.8	4.74	203.3	403.3	31.7	Low	Colourless	Strong hydrocarbon odou	No sheen	Hydrasleeve
		21/03/2023	2.230	11.80	19.5	17.27	Good	0.87	36.6	23.8	4.93	146.4	346.4	29.5	Low	Light brown	Odourless	No sheen	Hydrasleeve
		5/10/2023	6.648	11.80	19.5	12.85	Good	2.22	124.3	74.6	5.69	24.7	224.7	5.65	Moderate	Pale brown	Odourless	No sheen	Hydrasleeve
		29/03/2024	2.373	12.45	19.5	17.13	Good	5.22	100.2	60.1	5.98	96.9	296.9	30.2	Low	White	Organic	No sheen	Hydrasleeve
Source Area 1	MW066	18/12/2019	4.930		23.19	18.26	Good	0.24	49.6	32.2	4.43	331.6	531.6	33.1	Low	Light grey	Odourless	No sheen	Hydrasleeve
		7/04/2020	2.040	12.00	23.19	21.15	Damaged	No sample, well damaged											
		4/11/2020	4.690	9.82	23.19	18.50	Damaged Gatic Cover	1.99	53.4	34.7	4.48	455.8	655.8	32.3	Low	Colourless	Odourless	No sheen	Hydrasleeve
		15/04/2021	2.977	11.95	23.19	20.21	Damaged Gatic Cover	1.51	51.4	33.4	5.10	218.3	418.3	30.5	Low	Colourless	Odourless	No sheen	Hydrasleeve
		3/06/2021	4.270	12.00	23.19	18.92	Damaged Gatic Cover	2.63	37.7	24.5	4.33	283.5	483.5	32.3	Low	Colourless	Odourless	No sheen	Hydrasleeve
		3/11/2021	5.925	11.93	23.19	17.27	Damaged Gatic Cover	2.06	52.5	34.1	4.81	197.5	397.5	32.1	Low	Colourless	Odourless	No sheen	Hydrasleeve
		22/04/2022	2.912	11.94	23.19	20.28	Damaged Gatic Cover	2.15	79.9	51.9	4.20	154.2	354.2	32.9	Low	Grey	Odourless	No sheen	Hydrasleeve
		20/09/2022	5.635	11.93	23.19	17.56	Good	1.54	64.7	42.1	4.50	217.9	417.9	32.7	Low	Pale brown	Odourless	No sheen	Hydrasleeve
		21/03/2023	2.722	11.94	23.19	20.47	Good	0.76	39.7	25.8	4.38	205.7	405.7	31.3	Low	Light brown	Odourless	No sheen	Hydrasleeve
		5/10/2023	5.919	11.94	23.19	17.27	Good	1.99	42.6	25.6	3.65	229.1	429.1	31.3	Low	Colourless	Odourless	No sheen	Hydrasleeve
		29/03/2024	2.671	8.98	23.19	20.52	Good	5.21	120.8	72.5	6.25	110.8	310.8	30.4	Low	Grey	Odourless	No sheen	Hydrasleeve
Source Area 2 and 3	MW080	18/12/2019	4.398	13.00	26.6	22.20	Good	0.48	62.5	40.6	4.95	248.5	448.5	32.1	Low	Colourless	Odourless	No sheen	Hydrasleeve
		7/04/2020	2.693	17.00	26.6	23.91	Good	0.93	63.7	41.4	5.29	187.3	387.3	31	Low	Colourless	Odourless	No sheen	Hydrasleeve
		7/05/2020	2.940	12.99	26.6	23.66	Good	0.95	53.4	34.7	5.09		200.0	30.4	Low	Grey	Odourless	No sheen	Hydrasleeve
		4/11/2020			26.6	26.60	Good	Dry											
		15/04/2021	2.494	12.99	26.6	24.11	Good	0.67	355.2	230.9	6.30	-5.3	194.7	31.6	-	-	-	-	-
		3/06/2021	3.435	18.50	26.6	23.17	Good	1.39	29.1	18.9	4.85	201.4	401.4	31.3	Low	Colourless	Odourless	No sheen	Hydrasleeve
		3/11/2021	4.636	12.99	26.6	21.96	Good	1.28	59.0	38.4	4.03	196.3	396.3	32	Low	Colourless	Odourless	No sheen	Hydrasleeve
		22/04/2022	2.511	13.00	26.6	24.09	Good	0.78	98.5	64.0	4.21	133.2	333.2	32.7	Cloudy	Colourless	Odourless	No sheen	Hydrasleeve
		20/09/2022	4.648	11.98	26.6	21.95	Good	1.82	65.5	42.6	4.38	245.2	445.2	30.6	Low	Yellow brown	Odourless	No sheen	Hydrasleeve
		21/03/2023	2.431	12.99	26.6	24.17	Good	0.55	48.7	31.7	4.73	117.3	317.3	29.6	Moderate	Light brown	Odourless	No sheen	Hydrasleeve
		5/10/2023	4.655	12.99	26.6	21.95	Good	3.39	89.4	53.6	5.27	45.4	245.4	29.8	Low	Pale brown	Odourless	No sheen	Hydrasleeve
		29/02/2024	2.435	12.28	26.6	24.17	Good	1.41	96.9	58.1	5.4	106.1	306.1	31.1	Low	Pale brown	Odourless	No sheen	Hydrasleeve

Location	Location Code	Date	Depth to Water (mbTOC)	Well Depth (mbTOC)	TOC (mAHD)	Water Elevation (mAHD)	Condition of Gatic	DO (mg/L)	EC (µS/cm)	TDS (calc) (mg/L)	pH	Eh (mV)	Redox (corr)(mV)	Temp (°C)	Turbidity	Water Colour	Odour	Sheen	Sample Method
Shoal Bay Receiving Station	MW112	18/12/2019	Did not measure due to tapped well					2.06	404.6	263.0	6.87	-45.6	154.4	33.2	Low	Colourless	Odourless	No sheen	Tap
		7/04/2020	Did not measure due to tapped well					Did not sample due to electrical pump failure											
		4/11/2020	Did not measure due to tapped well					4.46	385.6	250.6	6.2	23.2	223.2	28.4	Low	Colourless	Odourless	No sheen	Tap
		16/04/2021	Did not measure due to tapped well					2.13	375.7	244.2	6.88	-50.1	149.9	31.6	Low	Colourless	Odourless	No sheen	Tap
		2/11/2021	Did not measure due to tapped well					1.11	279.4	181.6	5.89	32.9	239.3	24.9	Medium	Orange / Brown	No odour	No sheen	Tap
		21/04/2022	Did not measure due to tapped well					2.98	339.4	220.6	6.75	-74.2	239.3	29.3	Low	Orange	Odourless	No sheen	Tap
		21/09/2022	Did not measure due to tapped well					3.02	799	519.4	7.32	-37.5	162.5	32.9	Low	Light brown	Odourless	No sheen	Tap
		22/03/2023	Did not measure due to tapped well					No parameters collected											Tap
		5/10/2023	Did not measure due to tapped well					5.08	248.2	148.9	6.7	81.3	281.3	28.7	Low	Colourless	Odourless	No sheen	Tap
		-	Did not measure due to tapped well					5.22	0.6	0.4	5.7	265.7	465.7	35.7	Low	Colourless	Odourless	No sheen	Tap
Shoal Bay Receiving Station	MW113	18/12/2019	Did not measure due to tapped well					1.58	332.4	216.1	6.53	-63.7	136.3	32.4	Low	Colourless	Odourless	No sheen	Tap
		7/04/2020	Did not measure due to tapped well					36.4	305.6	198.6	6.63	-2	198.0	33	Low	Colourless	Odourless	No sheen	Tap
		4/11/2020	Did not measure due to tapped well					3.06	342.3	222.5	6.47	-22.6	177.4	30.6	Low	Colourless	Odourless	No sheen	Tap
		16/04/2021	Did not measure due to tapped well					1.32	324.1	210.7	6.79	-78.9	121.1	31.7	Low	Colourless	Odourless	No sheen	Tap
		2/11/2021	Did not measure due to tapped well					1.34	361.8	235.2	5.9	98.8	298.8	24.8	Low	Grey	No odour	No sheen	Tap
		21/04/2022	Did not measure due to tapped well					3.04	364.4	236.9	6.82	63.2	263.2	31.3	Low	Colourless	Odourless	No sheen	Tap
		21/09/2022	Did not measure due to tapped well					2.71	384.7	250.1	6.77	-52.8	147.2	33	Low	Light brown	Odourless	No sheen	Tap
		22/03/2023	Did not measure due to tapped well					No parameters collected											Tap
		5/10/2023	Did not measure due to tapped well					6.37	304.7	182.8	6.45	67.6	267.6	29.6	Low	Colourless	Odourless	No sheen	Tap
		-	Did not measure due to tapped well					1.99	392.3	235.4	7.0	100.3	300.3	36.8	Low	Colourless	Odourless	No sheen	Tap

Notes:

mbTOC: metres below top of casing

mAHD: metres Australia Height Datum

mg/L: milligram per Litre

µS/cm: microsiemens per centimetre

NM: not measured

mV: millivolts

°C: degrees celcius

Redox Corrected = redox potential relative to the standard hydrogen electrode (Eh = Er + 200mV)

DO Values not presented due to YSI malfunction for MW018, MW021, MW021D and MW023 during March 2024 monitoring

^MW024 - contingency well for MW023

* = Results taken from MW005 as an alternate well to MW004

						PFAS - Perfluoroalkyl Sulfonic Acids						PFAS - Perfluoroalkyl Carboxylic Acids										PFAS - (n:2) Fluorotelomer				PFAS - Perfluoroalkyl Sulfonamides							PFAS	
						Perfluorobutane sulfonic acid (PFBS)	Perfluoropentane sulfonic acid (PFPeS)	Perfluorohexane sulfonic acid (PFHxS)	Perfluoroheptane sulfonic acid (PFHpS)	Perfluorooctane sulfonic acid (PFOS)	Perfluorodecane sulfonic acid (PFDS)	Perfluorobutanoic acid (PFBA)	Perfluoropentanoic acid (PFPeA)	Perfluorohexanoic acid (PFHxA)	Perfluoroheptanoic acid (PFHpA)	Perfluorooctanoic acid (PFOA)	Perfluorononanoic acid (PFNA)	Perfluorodecanoic acid (PFDA)	Perfluoroundecanoic acid (PFUnDA)	Perfluorododecanoic acid (PFDoDA)	Perfluorotridecanoic acid (PFTrDA)	Perfluorotetradecanoic acid (PFTeDA)	4:2 Fluorotelomer sulfonic acid (4:2 FTS)	6:2 Fluorotelomer sulfonic acid (6:2 FTS)	8:2 Fluorotelomer sulfonic acid (8:2 FTS)	10:2 Fluorotelomer sulfonic acid (10:2 FTS)	Perfluorooctane sulfonamide (FOSA)	N-Methyl perfluorooctane sulfonamide (MeFOSA)	N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	N-methyl perfluorooctane sulfonamidoethanol (MeFOSE)	N-Ethyl perfluorooctane sulfonamide (EtFOSA)	N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	Sum of PFHxS and PFOS	Sum of PFAS
						µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
EQL						0.01	0.01	0.01	0.01	0.01	0.01	0.05	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.02	0.01	0.05	0.02	0.01	0.05	0.01	0.01
PFAS NEMP 2025 Drinking Water								0.07		0.07						0.56																	0.07	
PFAS NEMP 2025 Freshwater 99%										0.00023						19																		
Location	**Location Code**	**Field ID**	**Date**	**Lab Report Number**	**Sample Type**																													
Source Area 1	**MW012**	**1200_MW012_231009**	**09 Oct 2023**	**ES2334612**	**Normal**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01
	MW012	**1200_MW012_240312**	**12 Mar 2024**	**ES2408291**	**Normal**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01
	MW012D	**1200_MW012D_231009**	**09 Oct 2023**	**ES2334612**	**Normal**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01
	MW012D	**1200_MW012D_240312**	**12 Mar 2024**	**ES2408291**	**Normal**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01
	MW018	**1200_MW018_231006**	**06 Oct 2023**	**ES2334612**	**Normal**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01
	MW018	**1200_MW018_240301**	**01 Mar 2024**	**ES2408291**	**Normal**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01
	MW021	**1200_MW021_231006**	**06 Oct 2023**	**ES2334612**	**Normal**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01
	MW021	**1200_MW021_240301**	**01 Mar 2024**	**ES2408291**	**Normal**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01
	MW021D	**1200_MW021D_231006**	**06 Oct 2023**	**ES2334612**	**Normal**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01
	MW021D	**1200_MW021D_240301**	**01 Mar 2024**	**ES2408291**	**Normal**	<0.02	<0.02	<0.01	<0.02	**0.03**	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	**0.03**	<0.01
	MW066	**1200_MW066_231009**	**09 Oct 2023**	**ES2334612**	**Normal**	<0.02	<0.02	**0.09**	<0.02	**0.36**	<0.02	<0.1	<0.02	**0.03**	<0.02	**0.02**	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	**0.45**	**0.03**
	MW066	**1200_MW066_240307**	**12 Mar 2024**	**ES2408291**	**Normal**	**0.03**	**0.03**	**0.18**	<0.02	**0.16**	<0.02	<0.1	**0.02**	**0.07**	<0.02	**0.02**	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	**0.34**	**0.02**
Source Area 2 and 3	**MW004**	**1200_MW004_240305**	**05 Mar 2024**	**ES2408291**	**Normal**	<0.02	<0.02	**0.05**	<0.02	**0.08**	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	**0.13**	**0.22**
	MW004D	**1200_MW004D_231009**	**09 Oct 2023**	**ES2334612**	**Normal**	<0.02	<0.02	<0.01	<0.02	**0.01**	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	**0.01**	**0.19**
	MW004D	**1200_QC100_231128**	**28 Nov 2023**	**ES2341145**	**Field_D**	<0.02	<0.02	<0.01	<0.02	**0.03**	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	**0.03**	**0.03**
	MW004D	**1200_QC200_231128**	**28 Nov 2023**	**RN1413202**	**Interlab_D**	<0.01	<0.01	<0.01	<0.01	**0.026**	<0.01	<0.05	<0.02	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.02	<0.02	<0.01	<0.01	<0.01	<0.01	<0.01	<0.02	<0.01	<0.05	<0.02	<0.01	<0.05	**0.026**	**0.19**
	MW004D	**1200_MW004D_231128**	**28 Nov 2023**	**ES2341145**	**Normal**	<0.02	<0.02	<0.01	<0.02	**0.02**	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	**0.02**	**0.20**
	MW004D	**1200_QC200_240305**	**05 Mar 2024**	**RN1422787**	**Interlab_D**	<0.01	<0.01	<0.01	<0.01	<0.02	<0.01	<0.05	<0.02	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.02	<0.02	<0.01	<0.01	<0.01	<0.01	<0.01	<0.02	<0.01	<0.05	<0.02	<0.01	<0.05	<0.01	<0.01
	MW004D	**1200_MW004D_240305**	**05 Mar 2024**	**ES2408291**	**Normal**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01
	MW004D	**1200_QC100_240305**	**05 Mar 2024**	**ES2408291**	**Field_D**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01
	MW031	**1200_MW031_231009**	**09 Oct 2023**	**ES2334612**	**Normal**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01
	MW031	**1200_MW031_240308**	**08 Mar 2024**	**ES2408291**	**Normal**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01
	MW080	**1200_MW080_231009**	**09 Oct 2023**	**ES2334612**	**Normal**	<0.02	<0.02	<0.01	<0.02	**0.02**	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	**0.02**	**0.01**
	MW080	**1200_MW080_240305**	**05 Mar 2024**	**ES2408291**	**Normal**	<0.02	<0.02	<0.01	<0.02	**0.03**	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	**0.03**	**0.01**
Northern Bores	**MW023**	**1200_MW023_240301**	**01 Mar 2024**	**ES2408291**	**Normal**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01
	MW024	**1200_MW024_231006**	**06 Oct 2023**	**ES2334612**	**Normal**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01
	MW032	**1200_MW032_231009**	**09 Oct 2023**	**ES2334612**	**Normal**	<0.02	<0.02	**0.02**	<0.02	**0.04**	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	**0.06**	**0.34**
	MW032	**1200_MW032_240307**	**11 Mar 2024**	**ES2408291**	**Normal**	<0.02	<0.02	**0.02**	<0.02	**0.04**	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	**0.06**	**0.08**
	MW034	**1200_QC101_231009**	**09 Oct 2023**	**ES2334612**	**Field_D**	<0.02	<0.02	**0.03**	<0.02	**0.12**	<0.02	<0.1	**0.04**	**0.04**	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	**0.15**	**0.15**
	MW034	**1200_MW034_231009**	**09 Oct 2023**	**ES2334612**	**Normal**	<0.02	<0.02	**0.03**	<0.02	**0.1**	<0.02	<0.1	**0.04**	**0.04**	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	**0.13**	<0.1
	MW034	**1200_QC201_231009**	**09 Oct 2023**	**RN1408243**	**Interlab_D**	<0.01	<0.01	**0.016**	<0.01	**0.035**	<0.01	<0.05	**0.021**	**0.015**	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.02	<0.02	<0.01	<0.01	<0.01	<0.01	<0.01	<0.02	<0.01	<0.05	<0.02	<0.01	<0.05	**0.051**	**0.07**
	MW034	**1200_MW034_240312**	**12 Mar 2024**	**ES2408291**	**Normal**	<0.02	<0.02	**0.03**	<0.02	**0.1**	<0.02	<0.1	**0.03**	**0.04**	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	**0.13**	**0.15**
	MW034	**1200_QC101_240312**	**12 Mar 2024**	**ES2408291**	**Field_D**	<0.02	<0.02	**0.03**	<0.02	**0.1**	<0.02	<0.1	**0.04**	**0.04**	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	**0.13**	**0.21**
	MW034	**1200_QC201_240312**	**12 Mar 2024**	**RN1422787**	**Interlab_D**	<0.01	<0.01	**0.017**	<0.01	**0.072**	<0.01	<0.05	<0.02	**0.026**	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.02	<0.02	<0.01	<0.01	<0.01	<0.01	<0.01	<0.02	<0.01	<0.05	<0.02	<0.01	<0.05	**0.089**	**0.09**
Southern Bores	**MW001**	**1200_QC100_231009**	**09 Oct 2023**	**ES2334612**	**Field_D**	<0.02	<0.02	**0.04**	<0.02	**0.1**	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	**0.14**	**0.50**
	MW001	**1200_MW001_231009**	**09 Oct 2023**	**ES2334612**	**Normal**	<0.02	<0.02	**0.04**	<0.02	**0.09**	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	**0.13**	**0.53**
	MW001	**1200_QC200_231009**	**09 Oct 2023**	**RN1408243**	**Interlab_D**	<0.01	<0.01	**0.029**	<0.01	**0.026**	<0.01	<0.05	<0.02	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.02	<0.02	<0.01	<0.01	<0.01	<0.01	<0.01	<0.02	<0.01	<0.05	<0.02	<0.01	<0.05	**0.055**	**0.055**
	MW001	**1200_MW001_240306**	**11 Mar 2024**	**ES2408291**	**Normal**	<0.02	<0.02	**0.04**	<0.02	**0.09**	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	**0.13**	**0.47**
	MW029	**1200_MW029_231009**	**09 Oct 2023**	**ES2334612**	**Normal**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01
	MW029	**1200_MW029_240308**	**08 Mar 2024**	**ES2408291**	**Normal**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01
	MW030	**1200_MW030_231009**	**09 Oct 2023**	**ES2334612**	**Normal**	<0.02	<0.02	**0.03**	<0.02	**0.08**	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	**0.11**	**0.21**
	MW030	**1200_MW030_240308**	**08 Mar 2024**	**ES2408291**	**Normal**	<0.02	<0.02	**0.04**	<0.02	**0.07**	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	**0.11**	**0.14**
Shoal Bay Receiving Station	**MW112**	**1200_MW112_231009**	**09 Oct 2023**	**ES2334612**	**Normal**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01
	MW112	**1200_MW112_240305**	**05 Mar 2024**	**ES2408291**	**Normal**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01
	MW113	**1200_MW113_231009**	**09 Oct 2023**	**ES2334612**	**Normal**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01
	MW113	**1200_MW113_240305**	**05 Mar 2024**	**ES2408291**	**Normal**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01

Environmental Standards

HEPA (2025), PFAS NEMP 3.0 Drinking Water

HEPA (2025), PFAS NEMP 3.0 Freshwater 99%

Location	Location Code	Date	DO (mg/L)	EC (µS/cm)	TDS (calc) (mg/L)	pH	Redox (mV)	Redox (corr)(mV)	Temp (°C)	Turbidity	Water Colour	Odour	Sheen	Sample Method	Flow Rate
Base Drainage Lines	**SW001**	22/01/2020	5.10	16.0	10.4	6.8	224.0	424.0	25.5	Clear	Clear	No odour	No sheen	Grab sample	-
		6/04/2020	73.40	48.8	31.7	6.4	165.1	365.1	35.1	Clear	No Colour	No Odour	No Sheen	Grab sample	-
		21/12/2020	3.49	83.6	54.3	7.4	181.3	381.3	30.5	Clear	Colourless	Odourless	No Sheen	Grab Sample	-
		15/04/2021	4.56	55.8	36.3	6.2	107.1	307.1	34.5	Clear	Colourless	Odourless	No Sheen	Grab Sample	-
		20/01/2022	4.37	45.3	29.4	5.6	187.2	387.2	31.7	Clear	Colourless	Odourless	No Sheen	Grab Sample	
		22/04/2022	2.53	246.7	160.4	5.5	97.1	297.1	30.8	Clear	Colourless, algae present	Odourless	No Sheen	Grab Sample	
		28/11/2022	1.51	77.0	50.1	6.9	77.7	277.7	32.6	Low	Colourless	Odourless	No Sheen	Grab Sample	Low Flow
		23/03/2023	1.23	55.1	35.8	5.1	134.2	334.2	29.9	Low	Colourless	Odourless	No Sheen	Grab Sample	-
		15/12/2023	4.44	66.6	40.0	7.3	93.6	293.6	29.0	Low	Pale brown	Odourless	No sheen	Grab	Low
		6/03/2024	4.01	36.8	22.1	5.6	32.2	232.2	28.6	Moderate	Pale brown	Odourless	No sheen	Grab	Low
	SW007	18/12/2019	2.72	65.5	42.6	6.4	241.7	441.7	35.6	-	-	No odour	-	Grab sample	-
		22/01/2020	5.00	13.1	8.5	7.1	197.9	397.9	24.4	Clear	Clear	No odour	No sheen	Grab sample	-
		6/04/2020	5.42	39.4	25.6	5.9	204.2	404.2	34.3	Clear	No Colour	No Odour	No Sheen	Grab sample	-
		21/12/2020	5.96	42.2	27.4	7.9	141.3	341.3	31.6	Clear	Colourless	Odourless	No Sheen	Grab Sample	-
		15/04/2021	6.75	21.7	14.1	5.4	208.8	408.8	32.8	Clear	Colourless	Hydrogen Sulphide Odour	No Sheen	Grab Sample	-
		20/01/2022	7.38	22.8	14.8	5.7	174.5	374.5	32.3	Clear	Clear	No odour	No sheen		
		22/04/2022	3.86	53.6	34.8	6.2	72.3	272.3	32.9	Clear	Clear, algae present	No odour	No sheen		Low Flow
		28/11/2022	2.16	54.7	35.6	6.2	103.3	303.3	29.7	High	Pale Yellow, green algae present	Organic odour	No Sheen	Grab Sample	-
		22/03/2023	1.94	195.6	127.1	5.5	31.6	231.6	30.4	High	Colourless	Odourless	No Sheen	Grab Sample	-
		15/12/2023	3.77	80.0	48.0	6.9	100.3	300.3	28.2	Low	Colourless	Odourless	No sheen	Grab	Low
		5/03/2024	2.54	21.0	12.6	5.5	73.2	273.2	29.5	Low	Colourless	Odourless	No sheen	Grab	Low
	SW023	18/12/2019	Sampling location dry - unable to sample												No Flow
		22/01/2020	5.70	22.1	14.4	7.1	185.2	385.2	25.2	Clear	-	No odour	No sheen	Grab sample	-
		6/04/2020	Sampling location dry - unable to sample												No Flow
		21/12/2020	Sampling location dry - unable to sample												No Flow
		15/04/2021	Sampling location dry - unable to sample												No Flow
		20/01/2022	4.59	32.8	21.3	5.8	181.5	381.5	30.5	High	Pale brown	No odour	No sheen	Grab sample	
		22/04/2022	Sampling location dry - unable to sample												No Flow
		28/11/2022	2.81	62.5	40.6	7.0	275.8	475.8	27.3	Clear	Clear	Odourless	No Sheen	Grab Sample	No Flow
		21/03/2023	Sampling location dry - unable to sample												No Flow
		14/12/2023	5.35	52.0	31.2	8.3	78.6	278.6	28.1	Low	Colourless	Odourless	No sheen	Grab	Low
		5/03/2024	5.22	30.1	18.1	7.0	81.7	281.7	30.5	Low	Colourless	Odourless	No sheen	Grab	Low
	SW028	18/12/2019	Sampling location dry - unable to sample												No Flow
		22/01/2020	4.20	8.8	5.7	7.2	189.2	389.2	24.8	Clear	Clear	No odour	No sheen	Grab sample	-
		6/04/2020	Sampling location dry - unable to sample												No Flow
		21/12/2020	Sampling location dry - unable to sample												No Flow
		15/04/2021	Sampling location dry - unable to sample												No Flow
		20/01/2022	4.73	5.6	3.6	5.8	205.6	405.6	27.9	High	Pale brown	No odour	No sheen	Grab sample	
		22/04/2022	Sampling location dry - unable to sample												No Flow
		28/11/2022	1.94	13.5	8.8	6.4	98.5	298.5	29.0	Low	Colourless	Odourless	No Sheen	Grab Sample	No Flow
		21/03/2023	Field parameters and observations not saved - electronic data error											Grab Sample	
		14/12/2023	5.09	33.4	20.0	8.1	77.5	277.5	27.6	Low	Colourless	Odourless	No sheen	Grab	Low
		5/03/2024	3.40	14.4	8.6	6.5	73.0	273.0	35.3	Low	Colourless	Odourless	No sheen	Grab	Low
	SW059	18/12/2019	Sampling location dry - unable to sample												No Flow
		22/01/2020	5.00	42.1	27.4	6.8	198.9	398.9	25.2	Clear	Clear	No odour	No sheen	Grab sample	-
		21/12/2020	4.17	25.5	16.6	7.7	165.3	365.3	33.2	Clear	Colourless	Odourless	No Sheen	Grab Sample	-
		20/01/2022	5.32	20.1	13.1	5.7	211.3	411.3	29.1	Clear	Colourless	Odourless	No Sheen	Grab Sample	
		22/04/2022	4.02	68.2	44.3	6.8	105.2	305.2	34.2	Low	Slight brown	Odourless	No Sheen	Grab Sample	
		15/04/2021	4.31	27.5	17.9	6.7	97.4	297.4	35.0	Clear	Colourless	Slight Organic Odour	No Sheen	Grab Sample	-
		24/11/2022	2.78	18.9	12.3	6.5	76.7	276.7	-	Low	Pale brown	Odourless	No Sheen	Grab Sample	No Flow
		21/03/2023	1.44	23.3	15.1	5.0	149.2	349.2	30.2	Clear	Colourless	Odourless	No Sheen	Grab Sample	-
		11/12/2023	5.00	59.8	35.9	6.9	103.0	303.0	28.3	Low	Colourless	Odourless	No sheen	Grab	Pooled

Location	Location Code	Date	DO (mg/L)	EC (µS/cm)	TDS (calc) (mg/L)	pH	Redox (mV)	Redox (corr)(mV)	Temp (°C)	Turbidity	Water Colour	Odour	Sheen	Sample Method	Flow Rate
		7/03/2024	3.68	20.4	12.2	5.9	33.4	233.4	27.6	Low	Colourless	Odourless	No sheen	Grab	Low
	SW075	18/12/2019	4.25	35.7	23.2	6.0	261.0	461.0	31.3	Low	Clear	No odour	No sheen	Grab sample	-
		22/01/2020	5.20	21.8	14.2	6.8	206.9	406.9	25.0	Clear	Clear	No odour	No sheen	Grab sample	-
		6/04/2020	55.50	32.8	21.3	6.1	205.1	405.1	31.3	Clear	No Colour	No Odour	No Sheen	Grab sample	-
		15/12/2020	0.89	40.4	26.3	6.3	161.9	361.9	29.8	Clear	Colourless	Odourless	No Sheen	Grab Sample	-
		15/04/2021	-	28.3	18.4	5.5	158.6	358.6	31.8	Clear	Colourless	Odourless	No Sheen	Grab Sample	-
		20/01/2022	3.80	35.0	22.8	6.8	122.2	322.2	32.5	Clear	Colourless	Odourless	No Sheen	Grab Sample	
		22/04/2022	3.62	64.5	41.9	5.4	80.5	280.5	28.2	Low	Colourless	Odourless	No Sheen	Grab Sample	Low Flow
		24/11/2022	3.66	17.4	11.3	6.6	80.9	280.9	-	Moderate	Pale brown	Odourless	No Sheen	Grab Sample	Low Flow
		21/03/2023	Field parameters and observations not saved - electronic data error											Grab Sample	
		14/12/2023	4.09	48.5	29.1	6.8	-204.4	-4.4	31.8	Low	Colourless	Odourless	No sheen	Grab	Low
		8/03/2024	4.13	20.2	12.1	5.7	24.2	224.2	29.5	Low	Colourless	Odourless	No sheen	Grab	Low
Close Training Area	SW086	18/12/2019	3.77	40.9	26.6	5.8	167.0	367.0	34.9	Low	Clear	No odour	No sheen	Grab sample	-
		22/01/2020	4.95	24.4	15.9	7.2	212.6	412.6	25.2	Clear	Clear	No odour	No sheen	Grab sample	-
		6/04/2020	3.55	28.6	18.6	6.4	148.4	348.4	31.1	Clear	No Colour	No Odour	No Sheen	Grab sample	-
		15/12/2020	0.89	36.1	23.5	5.8	155.0	355.0	29.8	Clear	Colourless	Odourless	No Sheen	Grab Sample	-
		15/04/2021	4.73	23.5	15.3	5.3	133.2	333.2	28.8	Clear	Colourless	Odourless	No Sheen	Grab Sample	-
		20/01/2022	3.02	40.5	26.3	6.9	109.0	309.0	29.6	Clear	Colourless	Odourless	No Sheen	Grab Sample	
		22/04/2022	4.47	58.9	38.3	6.7	58.2	258.2	29.8	Low	Colourless	Odourless	No Sheen	Grab Sample	High Flow
		24/11/2022	3.24	44.2	28.7	5.8	116.6	316.6	-	Low	Pale brown	Odourless	No Sheen	Grab Sample	Low Flow
		22/03/2023	5.18	41.9	27.2	5.8	48.2	248.2	30.1	Clear	Colourless	Odourless	No Sheen	Grab Sample	High Flow
		28/11/2023	1.48	47.6	28.6	5.0	115.0	315.0	29.8	Low	Pale brown	Odourless	No sheen	Grab	Pooled
		1/03/2024	-	61.7	37.0	7.0	90.8	290.8	30.3	Moderate	Brown	Odourless	No sheen	Grab	Low
	SW091	18/12/2019	3.85	47.4	30.8	6.0	105.9	305.9	30.6	Clear	Colourless	No odour	No sheen	Grab sample	-
		22/01/2020	4.90	24.9	16.2	7.4	153.0	353.0	25.6	Clear	Colourless	No odour	No sheen	Grab sample	-
		6/04/2020	3.94	176.1	114.5	7.1	97.5	297.5	30.3	Clear	Colourless	No Odour	No Sheen	Grab sample	-
		15/12/2020	1.57	119.9	77.9	8.4	84.0	284.0	30.6	Clear	Colourless	Odourless	No Sheen	Grab Sample	-
		15/04/2021	4.75	25.7	16.7	7.9	70.1	270.1	28.5	Clear	Colourless	Odourless	No Sheen	Grab Sample	-
		20/01/2022	3.50	27.1	17.6	6.4	117.2	317.2	29.7	Clear	Colourless	Odourless	No Sheen	Grab Sample	
		22/04/2022	4.07	55.8	36.3	5.9	70.2	270.2	29.9	Low	Slight brown	Odourless	No Sheen	Grab Sample	Mod Flow
		24/11/2022	3.48	18.3	11.9	6.2	94.3	294.3	-	Low	Pale brown	Odourless	No Sheen	Grab Sample	Mod Flow
		23/03/2023	5.62	44.3	28.8	6.1	38.4	238.4	30.1	High	Colourless	Odourless	No Sheen	Grab Sample	High Flow
		28/11/2023	1.79	36.1	21.7	5.2	96.2	296.2	29.1	Moderate	Pale yellow	Organic odour	Organic sheen	Grab	Moderate
		1/03/2024	-	27.3	16.4	6.8	93.9	293.9	32.3	Low	Colourless	Odourless	No sheen	Grab	Moderate
	SW123	18/12/2019	1.20	37.5	24.4	5.4	151.8	351.8	30.2	Low	Light Brown	No odour	No Sheen	Grab sample	-
		6/04/2020	2.56	26.8	17.4	6.3	165.3	365.3	31.3	Clear	No Colour	No Odour	No Sheen	Grab sample	-
		15/12/2020	0.56	37.1	24.1	7.9	139.6	339.6	34.7	Clear	Colourless	Odourless	No Sheen	Grab Sample	-
		15/04/2021	3.64	19.1	12.4	6.2	114.9	314.9	29.3	Clear	Colourless	Odourless	No Sheen	Grab Sample	-
		20/01/2022	2.92	21.5	14.0	6.7	144.5	344.5	29.1	Clear	Colourless	Odourless	No Sheen	Grab Sample	
		22/04/2022	4.00	49.2	32.0	5.8	-	-	29.6	Low	Slight yellow	Odourless	No Sheen	Grab Sample	Low Flow
		24/11/2022	3.19	26.7	17.4	6.2	80.4	280.4	-	Clear	Colourless	Slight organic odour	No Sheen	Grab Sample	Low Flow
		23/03/2023	4.94	34.8	22.6	5.9	44.5	244.5	29.7	Clear	Colourless	Odourless	No Sheen	Grab Sample	High Flow
		28/11/2023	2.27	55.5	33.3	6.1	94.8	294.8	28.8	Low	Colourless	Odourless	No sheen	Grab	Moderate
		1/03/2024	-	32.8	19.7	6.3	76.1	276.1	31.7	Low	Colourless	Odourless	No sheen	Grab	Moderate

Notes:

mg/L: milligram per Litre

µS/cm: microsiemens per centimetre

mV: millivolts

°C: degrees celcius

Redox Corrected = redox potential relative to the standard hydrogen electrode (Eh = Er + 200mV)

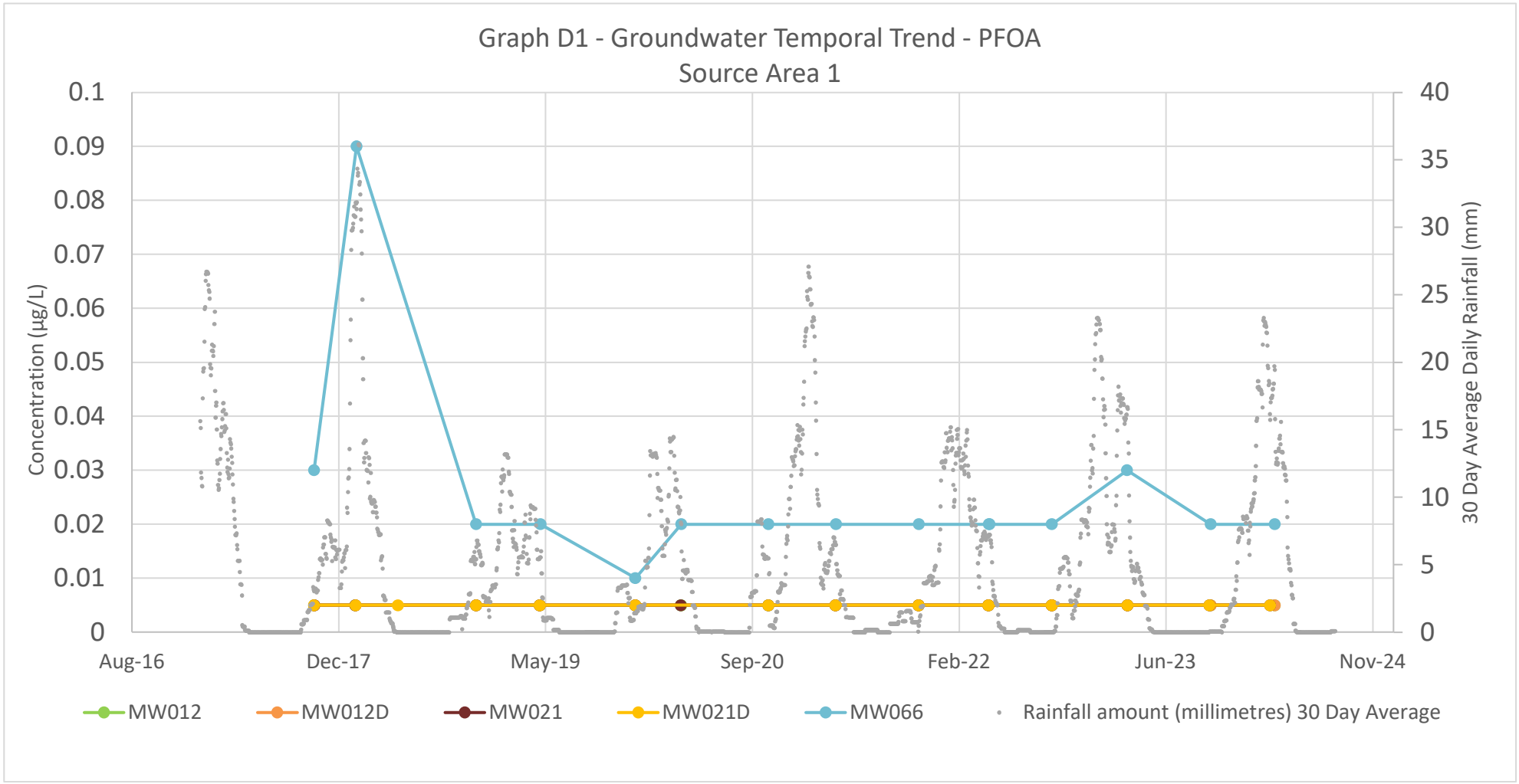
DO Values not presented due to YSI malfunction for SW086, SW091 and SW123 during March 2024 monitoring

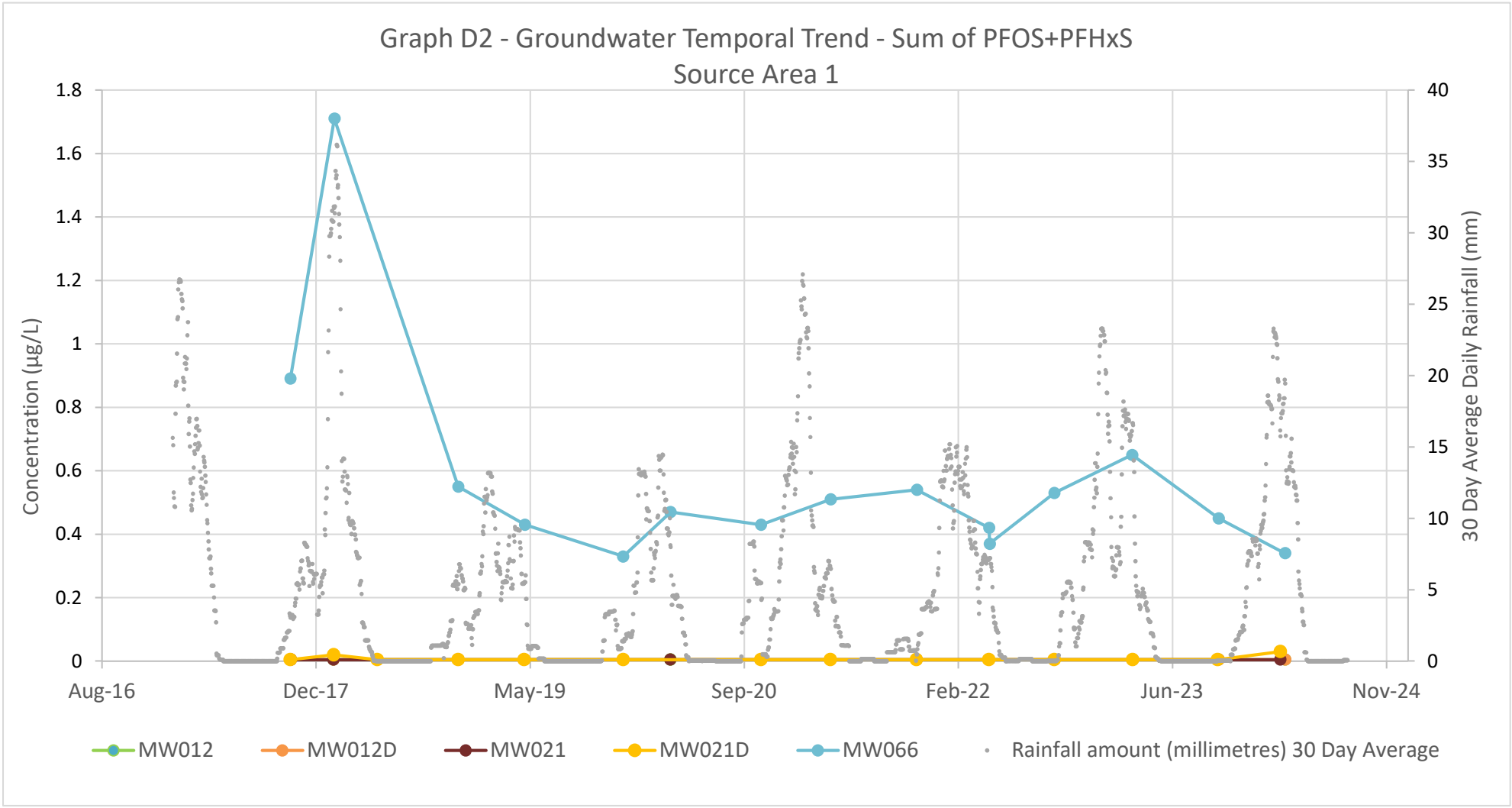
						PFAS - Perfluoroalkyl Sulfonic Acids						PFAS - Perfluoroalkyl Carboxylic Acids											PFAS - (n:2) Fluorotelomer Sulfonic				PFAS - Perfluoroalkyl Sulfonamides							PFAS	
						Perfluorobutane sulfonic acid (PFBS)	Perfluoropentane sulfonic acid (PFPeS)	Perfluorohexane sulfonic acid (PFHxS)	Perfluoroheptane sulfonic acid (PFHpS)	Perfluorooctane sulfonic acid (PFOS)	Perfluorodecane sulfonic acid (PFDS)	Perfluorobutanoic acid (PFBA)	Perfluoropentanoic acid (PFPeA)	Perfluorohexanoic acid (PFHxA)	Perfluoroheptanoic acid (PFHpA)	Perfluorooctanoic acid (PFOA)	Perfluorononanoic acid (PFNA)	Perfluorodecanoic acid (PFDA)	Perfluoroundecanoic acid (PFUnDA)	Perfluorododecanoic acid (PFDoDA)	Perfluorotridecanoic acid (PFTrDA)	Perfluorotetradecanoic acid (PFTeDA)	4:2 Fluorotelomer sulfonic acid (4:2 FTS)	6:2 Fluorotelomer sulfonic acid (6:2 FTS)	8:2 Fluorotelomer sulfonic acid (8:2 FTS)	10:2 Fluorotelomer sulfonic acid (10:2 FTS)	Perfluorooctane sulfonamide (FOSA)	N-Methyl perfluorooctane sulfonamide (MeFOSA)	N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	N-methyl perfluorooctane sulfonamidoethanol (MeFOSE)	N-Ethyl perfluorooctane sulfonamide (EtFOSA)	N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	Sum of PFHxS and PFOS	Sum of PFAS
						µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
EQL						0.01	0.01	0.01	0.01	0.01	0.01	0.05	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.02	0.01	0.05	0.02	0.01	0.05	0.01	0.01
PFAS NEMP 2025 Freshwater 99%										0.00023						19																		
PFAS NEMP 2025 Recreational Water								2		2						10																	2	
Location	**Location Code**	**Field ID**	**Date**	**Lab Report Number**	**Sample Type**																													
Base Drainage Lines	**SW001**	**SW001**	**04 Oct 2017**	**ES1725240**	**Normal**	<0.02	<0.02	<0.02	<0.02	0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.05	0.05
		SW001	**02 Feb 2018**	**ES1803862**	**Normal**	<0.02	<0.02	0.04	<0.02	0.05	<0.02	<0.1	<0.02	0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.09	0.11
		1200_SW001_200122	**22 Jan 2020**	**ES2002244**	**Normal**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01
		1200_SW001_200406	**06 Apr 2020**	**ES2012098**	**Normal**	<0.02	<0.02	<0.02	<0.02	0.04	<0.02	<0.1	0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.04	0.06
		1200_SW001_201221	**21 Dec 2020**	**ES2045525**	**Normal**	<0.02	<0.02	<0.02	<0.02	0.03	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.03	0.03
		1200_SW001_210415	**15 Apr 2021**	**ES2114376**	**Normal**	<0.02	<0.02	<0.02	<0.02	0.02	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.02	0.02
		1200_SW001_220120	**20 Jan 2022**	**ES2201971**	**Normal**	<0.02	<0.02	0.01	<0.02	0.02	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.03	0.03
		1200_SW001_220421	**21 Apr 2022**	**ES2214158**	**Normal**	<0.02	<0.02	<0.01	<0.02	0.02	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.02	0.02
		1200_SW001_221128	**28 Nov 2022**	**ES2242809**	**Normal**	<0.02	<0.02	<0.01	<0.02	0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.01	0.01
		1200_SW001_230322	**22 Mar 2023**	**ES2310005**	**Normal**	<0.02	<0.02	0.02	<0.02	0.03	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.05	0.05
		1200_SW001_231012	**15 Dec 2023**	**ES2343723**	**Normal**	<0.02	<0.02	<0.01	<0.02	0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.01	0.01
Base Drainage Lines	**SW007**	**SW007**	**02 Feb 2018**	**ES1803862**	**Normal**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01
		SW007	**01 May 2019**	**ES1913246**	**Normal**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01
		1200_SW007_191218	**18 Dec 2019**	**ES1942300**	**Normal**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	0.01
		1200_SW007_200122	**22 Jan 2020**	**ES2002244**	**Normal**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01
		1200_SW007_200406	**06 Apr 2020**	**ES2012098**	**Normal**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01
		1200_SW007_201221	**21 Dec 2020**	**ES2045525**	**Normal**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01
		1200_QC200_201221	**21 Dec 2020**	**RN1300711**	**Interlab_D**	<0.01	<0.01	<0.01	<0.01	<0.02	<0.01	<0.05	<0.02	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.02	<0.02	<0.01	<0.01	<0.01	<0.01	<0.01	<0.02	<0.01	<0.05	<0.02	<0.01	<0.05	<0.01	<0.01
		1200_SW007_210415	**15 Apr 2021**	**ES2114376**	**Normal**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01
		1200_SW007_220120	**20 Jan 2022**	**ES2201971**	**Normal**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01
		1200_SW007_220421	**21 Apr 2022**	**ES2214158**	**Normal**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01
		1200_SW007_221128	**28 Nov 2022**	**ES2242809**	**Normal**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01
		1200_SW007_230322	**22 Mar 2023**	**ES2310005**	**Normal**	<0.02	<0.02	0.02	<0.02	0.04	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.06	0.06
		1200_QC100_231215	**15 Dec 2023**	**ES2343723**	**Field_D**	<0.02	<0.02	0.01	<0.02	0.07	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.08	0.08
		1200_SW007_231215	**15 Dec 2023**	**ES2343723**	**Normal**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01
		1200_QC200_231215	**15 Dec 2023**	**RN1415098**	**Interlab_D**	<0.01	<0.01	<0.01	<0.01	<0.02	<0.01	<0.05	<0.02	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.02	<0.02	<0.01	<0.01	<0.01	<0.01	<0.01	<0.02	<0.01	<0.05	<0.02	<0.01	<0.05	<0.01	<0.01
		1200_SW007_240306	**06 Mar 2024**	**ES2408291**	**Normal**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01
Base Drainage Lines	**SW023**	**SW023**	**03 Feb 2018**	**ES1803868**	**Normal**	<0.02	<0.02	<0.02	<0.02	0.01	<0.02	<0.1	<0.02	0.04	<0.02	0.03	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.01	0.08
		1200_SW023_200122	**22 Jan 2020**	**ES2002244**	**Normal**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01
		1200_SW023_220120	**20 Jan 2022**	**ES2201971**	**Normal**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01
		1200_SW023_221128	**28 Nov 2022**	**ES2242809**	**Normal**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01
		1200_SW023_231215	**15 Dec 2023**	**ES2343723**	**Normal**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01
		1200_SW023_240305	**05 Mar 2024**	**ES2408291**	**Normal**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01
Base Drainage Lines	**SW028**	**SW028**	**02 Feb 2018**	**ES1803862**	**Normal**	<0.02	<0.02	0.10	<0.02	0.08	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.18	0.18
		1200_SW028_200122	**22 Jan 2020**	**ES2002244**	**Normal**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01
		1200_SW028_220120	**20 Jan 2022**	**ES2201971**	**Normal**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01
		1200_SW028_221128	**28 Nov 2022**	**ES2242809**	**Normal**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01
		1200_QC110_230321	**21 Mar 2023**	**ES2310005**	**Field_D**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01
		1200_SW028_230321	**21 Mar 2023**	**ES2310005**	**Normal**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01
		1200_QC210_230321	**21 Mar 2023**	**RN1388287**	**Interlab_D**	<0.01	<0.01	<0.01	<0.01	<0.02	<0.01	<0.05	<0.02	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.02	<0.02	<0.01	<0.01	<0.01	<0.01	<0.01	<0.02	<0.01	<0.05	<0.02	<0.01	<0.05	<0.01	<0.01
		1200_SW028_231215	**15 Dec 2023**	**ES2343723**	**Normal**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01
		1200_SW028_240305	**05 Mar 2024**	**ES2408291**	**Normal**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01
Base Drainage Lines	**SW059**	**SW059**	**01 Feb 2018**	**ES1803862**	**Normal**	0.05	0.06	0.29	<0.02	0.38	<0.02	<0.1	0.03	0.11	0.02	0.03	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.67	0.97
		QC201	**27 Nov 2018**	**630288**	**Interlab_D**	<0.01	<0.01	<0.01	<0.01	0.01	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	0.01	<0.1
		QC101	**27 Nov 2018**	**ES1835504**	**Field_D**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01
		SW059	**27 Nov 2018**	**ES1835504**	**Normal**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01
		QC213	**01 May 2019**	**653372**	**Interlab_D**	<0.01	<0.01	<0.01	<0.01	0.02	<0.01	0.06	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.02	<0.1
		QC113	**01 May 2019**	**ES1913246**	**Field_D**	<0.02	<0.02	<0.02	<0.02	0.02	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.02	0.02
		SW059	**01 May 2019**	**ES1913246**	**Normal**	<0.02	<0.02	<0.02	<0.02	0.12	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.12	0.12
		1200_SW059_200122	**22 Jan 2020**	**ES2002244**	**Normal**	<0.02	<0.02	0.02	<0.02	0.06	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.08	0.08
		1200_QC100_201221	**21 Dec 2020**	**ES2045525**	**Field_D**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01
		1200_SW059_201221	**21 Dec 2020**	**ES2045525**	**Normal**	<0.02	<0.02	<0.02	<0.02	0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.01	0.01
		1200_SW059_210415	**15 Apr 2021**	**ES2114376**	**Normal**	<0.02	<0.02	0.02	<0.02	0.03	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.05	0.05
		1200_SW059_220120	**20 Jan 2022**	**ES2201971**	**Normal**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01
		1200_SW059_220421	**21 Apr 2022**	**ES2214158**	**Normal**	<0.02	<0.02	0.07	<0.02	0.18	<0.02	<0.1	<0.02	0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.25	0.27
		1200_QC100_221124	**24 Nov 2022**	**ES2242809**	**Field_D**	<0.02	<0.02	<0.01	<0.02	0.03	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.03	0.03
		1200_SW059_221124	**24 Nov 2022**	**ES2242809**	**Normal**	<0.02	<0.02	<0.01	<0.02	0.03	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.03	0.03
		1200_QC200_221124	**24 Nov 2022**	**RN1374780**	**Interlab_D**	<0.01	<0.01	<0.01	<0.01	0.026	<0.01	<0.05	<0.02	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.02	<0.02	<0.01	<0.01	<0.01	<0.01	<0.01	<0.02	<0.01	<0.05	<0.02	<0.01	<0.05	0.026	0.026
		1200_SW059_230321	**21 Mar 2023**	**ES2310005**	**Normal**	<0.02	<0.02	0.05	<0.02	0.17	<0.02	<0.1	<0.02	0.03	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.22	0.25
		1200_QC100_231211	**11 Dec 2023**	**ES2343723**	**Field_D**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01
		1200_SW059_231211	**11 Dec 2023**	**ES2343723**	**Normal**	<0.02	<0.02	<0.01	<0.02	0.06	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.06	0.06
		1200_QC200_231211	**11 Dec 2023**	**RN1415098**	**Interlab_D**	<0.01	<0.01	0.011	<0.01	0.065	<0.01	<0.05	<0.02	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.02	<0.02	<0.01	<0.01	<0.01	<0.01	<0.01	<0.02	<0.01	<0.05	<0.02	<0.01	<0.05	0.065	0.065
		1200_SW059_240307	**07 Mar 2024**	**ES2408291**	**Normal**	<0.02	<0.02	0.05	<0.02	0.14	<0.02	<0.1	<0.02	0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.19	0.21
Base Drainage Lines	**SW075**	**SW075**	**17 Oct 2017**	**ES1725949**	**Normal**	<0.02	<0.02	<0.02	<0.02	0.06	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.06	0.06
		SW075	**02 Feb 2018**	**ES1803862**	**Normal**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01
		QC139	**23 May 2018**	**ES1814996**	**Field_D**

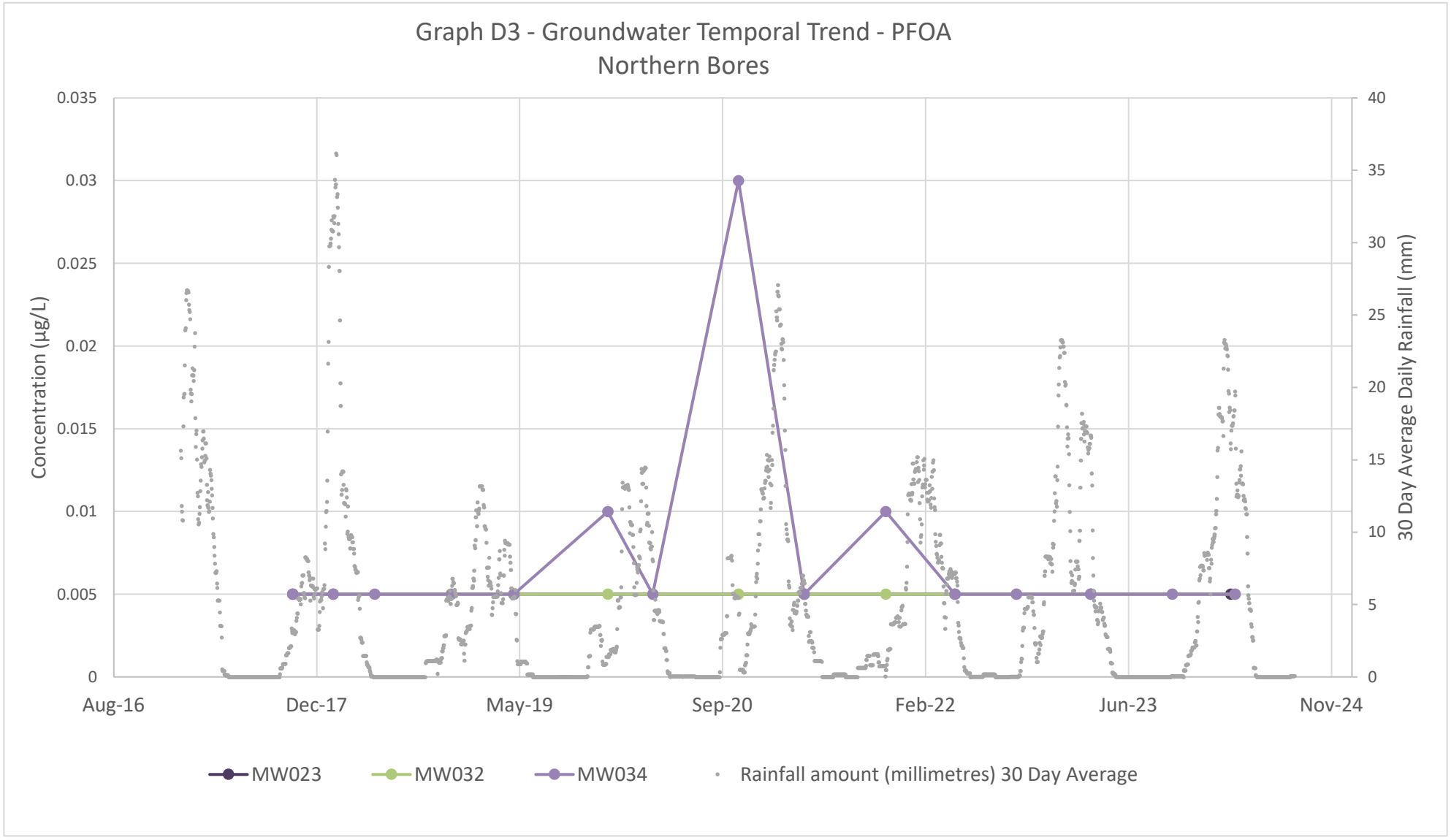
						PFAS - Perfluoroalkyl Sulfonic Acids						PFAS - Perfluoroalkyl Carboxylic Acids											PFAS - (n:2) Fluorotelomer Sulfonic				PFAS - Perfluoroalkyl Sulfonamides							PFAS	
						Perfluorobutane sulfonic acid (PFBS)	Perfluoropentane sulfonic acid (PFPeS)	Perfluorohexane sulfonic acid (PFHxS)	Perfluoroheptane sulfonic acid (PFHpS)	Perfluorooctane sulfonic acid (PFOS)	Perfluorodecane sulfonic acid (PFDS)	Perfluorobutanoic acid (PFBA)	Perfluoropentanoic acid (PFPeA)	Perfluorohexanoic acid (PFHxA)	Perfluoroheptanoic acid (PFHpA)	Perfluorooctanoic acid (PFOA)	Perfluorononanoic acid (PFNA)	Perfluorodecanoic acid (PFDA)	Perfluoroundecanoic acid (PFUnDA)	Perfluorododecanoic acid (PFDoDA)	Perfluorotrideanoic acid (PFTrDA)	Perfluorotetradecanoic acid (PFTeDA)	4:2 Fluorotelomer sulfonic acid (4:2 FTS)	6:2 Fluorotelomer sulfonic acid (6:2 FTS)	8:2 Fluorotelomer sulfonic acid (8:2 FTS)	10:2 Fluorotelomer sulfonic acid (10:2 FTS)	Perfluorooctane sulfonamide (FOSA)	N-Methyl perfluorooctane sulfonamide (MeFOSA)	N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	N-methyl perfluorooctane sulfonamidoethanol (MeFOSE)	N-Ethyl perfluorooctane sulfonamide (EtFOSA)	N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	Sum of PFHxS and PFOS	Sum of PFAS
						µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	4:2 Fluorotelomer sulfonic acid (4:2 FTS) µg/L	6:2 Fluorotelomer sulfonic acid (6:2 FTS) µg/L	8:2 Fluorotelomer sulfonic acid (8:2 FTS) µg/L	10:2 Fluorotelomer sulfonic acid (10:2 FTS) µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
EQL						0.01	0.01	0.01	0.01	0.01	0.01	0.05	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.02	0.01	0.05	0.02	0.01	0.05	0.01	0.01
PFAS NEMP 2025 Freshwater 99%										0.00023						19																			
PFAS NEMP 2025 Recreational Water								2		2						10																		2	
Location	**Location Code**	**Field ID**	**Date**	**Lab Report Number**	**Sample Type**																														
		1200_SW075_231215	**15 Dec 2023**	**ES2343723**	**Normal**	<0.02	<0.02	0.03	<0.02	0.07	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.10	0.10
Closed Training Area	**SW086**	**SW086**	**01 Feb 2018**	**ES1803862**	**Normal**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01
		SW086	**27 Nov 2018**	**ES1835504**	**Normal**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01
		SW086	**30 Apr 2019**	**ES1913246**	**Normal**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01
		1200_SW086_191218	**18 Dec 2019**	**ES1942300**	**Normal**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01
		1302_QC102_191218	**18 Dec 2019**	**ES1942300**	**Field_D**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01
		1200_QC202_191218	**18 Dec 2019**	**RN1259170**	**Interlab_D**	<0.01	<0.01	<0.01	<0.01	<0.02	<0.01	<0.05	<0.02	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.02	<0.02	<0.01	<0.01	<0.01	<0.01	<0.01	<0.02	<0.01	<0.05	<0.02	<0.01	<0.05	<0.01	<0.01
		1200_SW086_200122	**22 Jan 2020**	**ES2002244**	**Normal**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01
		1200_QC100_200406	**06 Apr 2020**	**ES2012098**	**Field_D**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01
		1200_SW086_200406	**06 Apr 2020**	**ES2012098**	**Normal**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01
		1200_QC200_200406	**06 Apr 2020**	**RN1270829**	**Interlab_D**	<0.01	<0.01	<0.01	<0.01	<0.02	<0.01	<0.05	<0.02	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.02	<0.02	<0.01	<0.01	<0.01	<0.01	<0.01	<0.02	<0.01	<0.05	<0.02	<0.01	<0.05	<0.01	<0.01
		1200_SW086_201215	**15 Dec 2020**	**ES2045382**	**Normal**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01
		1200_SW086_210415	**15 Apr 2021**	**ES2114376**	**Normal**	<0.02	<0.02	<0.02	<0.02	0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.01	0.01
		1200_SW086_220120	**20 Jan 2022**	**ES2201970**	**Normal**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01
		1200_SW086_220421	**21 Apr 2022**	**ES2214158**	**Normal**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01
		1200_SW086_221124	**24 Nov 2022**	**ES2242809**	**Normal**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01
		1200_SW086_230322	**22 Mar 2023**	**ES2310005**	**Normal**	<0.02	<0.02	<0.01	<0.02	0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.01	0.01
		1200_SW086_231128	**28 Nov 2023**	**ES2341145**	**Normal**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01
		1200_SW086_240301	**01 Mar 2024**	**ES2408291**	**Normal**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01
Closed Training Area	**SW091**	**SW091**	**19 Oct 2017**	**ES1726436**	**Normal**	<0.02	<0.02	0.03	<0.02	0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.08	0.08
		SW091	**01 Feb 2018**	**ES1803862**	**Normal**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01
		SW091	**27 Nov 2018**	**ES1835504**	**Normal**	<0.02	<0.02	0.03	<0.02	0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.08	0.08
		SW091	**30 Apr 2019**	**ES1913246**	**Normal**	<0.02	<0.02	<0.02	<0.02	0.03	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.03	0.03
		1200_SW091_191219	**18 Dec 2019**	**ES1942300**	**Normal**	<0.02	<0.02	0.03	<0.02	0.04	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.07	0.07
		1200_QC100_200122	**22 Jan 2020**	**ES2002244**	**Field_D**	<0.02	<0.02	<0.02	<0.02	0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.01	0.01
		1200_SW091_200122	**22 Jan 2020**	**ES2002244**	**Normal**	<0.02	<0.02	<0.02	<0.02	0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.01	0.01
		1200_SW091_200406	**06 Apr 2020**	**ES2012098**	**Normal**	<0.02	<0.02	<0.02	<0.02	0.02	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.02	0.02
		1200_SW091_201215	**15 Dec 2020**	**ES2045382**	**Normal**	<0.02	<0.02	<0.02	<0.02	0.04	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.04	0.04
		1200_QC202_210415	**15 Apr 2021**	**EB2110991**	**Interlab_D**	<0.02	<0.02	<0.02	<0.02	0.02	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.02	0.02
		1200_QC102_210415	**15 Apr 2021**	**ES2114376**	**Field_D**	<0.02	<0.02	<0.02	<0.02	0.02	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.02	0.02
		1200_SW091_210415	**15 Apr 2021**	**ES2114376**	**Normal**	<0.02	<0.02	<0.02	<0.02	0.02	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.02	0.02
		1200_SW091_220120	**20 Jan 2022**	**ES2201970**	**Normal**	<0.02	<0.02	<0.01	<0.02	0.02	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.02	0.02
		1200_SW091_220421	**21 Apr 2022**	**ES2214158**	**Normal**	<0.02	<0.02	0.01	<0.02	0.02	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.03	0.03
		1200_SW091_221124	**24 Nov 2022**	**ES2242809**	**Normal**	<0.02	<0.02	0.01	<0.02	0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.06	0.06
		1200_SW091_230322	**22 Mar 2023**	**ES2310005**	**Normal**	<0.02	<0.02	0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.01	0.01
		1200_SW091_231128	**28 Nov 2023**	**ES2341145**	**Normal**	<0.02	<0.02	0.02	<0.02	0.03	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.05	0.05
		1200_SW091_240301	**01 Mar 2024**	**ES2408291**	**Normal**	<0.02	<0.02	<0.01	<0.02	0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.01	0.01
Closed Training Area	**SW123**	**SW123**	**01 Feb 2018**	**ES1803862**	**Normal**	<0.02	<0.02	0.07	<0.02	0.14	<0.02	<0.1	<0.02	0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.21	0.23
		SW123	**23 May 2018**	**ES1814996**	**Normal**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01
		SW123	**27 Nov 2018**	**ES1835504**	**Normal**	<0.02	<0.02	0.11	<0.02	0.23	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	0.06	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.34	0.40
		1200_SW123_191218	**18 Dec 2019**	**ES1942300**	**Normal**	<0.02	<0.02	0.03	<0.02	0.03	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.06	0.06
		1200_SW123_200122	**22 Jan 2020**	**ES2002244**	**Normal**	<0.02	<0.02	<0.02	<0.02	0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.01	0.01
		1200_SW123_200406	**06 Apr 2020**	**ES2012098**	**Normal**	<0.02	<0.02	<0.02	<0.02	0.02	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.02	0.02
		1200_SW123_201215	**15 Dec 2020**	**ES2045382**	**Normal**	<0.02	<0.02	<0.02	<0.02	0.02	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.02	0.02
		1200_SW123_210415	**15 Apr 2021**	**ES2114376**	**Normal**	<0.02	<0.02	<0.02	<0.02	0.02	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.02	0.02
		1200_SW123_220120	**20 Jan 2022**	**ES2201970**	**Normal**	<0.02	<0.02	0.01	<0.02	0.02	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.03	0.03
		1200_SW123_220421	**21 Apr 2022**	**ES2214158**	**Normal**	<0.02	<0.02	0.02	<0.02	0.02	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.04	0.04
		1200_SW123_221124	**24 Nov 2022**	**ES2242809**	**Normal**	<0.02	<0.02	0.05	<0.02	0.20	<0.02	<0.1	<0.02	0.02	<0.02	0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.25	0.28
		1200_SW123_230322	**22 Mar 2023**	**ES2310005**	**Normal**	0.06	0.06	0.34	<0.02	0.01	<0.02	<0.1	0.03	0.30	0.07	0.15	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.35	1.02
		1200_SW123_231128	**28 Nov 2023**	**ES2341145**	**Normal**	<0.02	<0.02	0.07	<0.02	0.11	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.18	0.18
		1200_SW123_240301	**01 Mar 2024**	**ES2408291**	**Normal**	<0.02	<0.02	0.04	<0.02	0.12	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.16	0.16

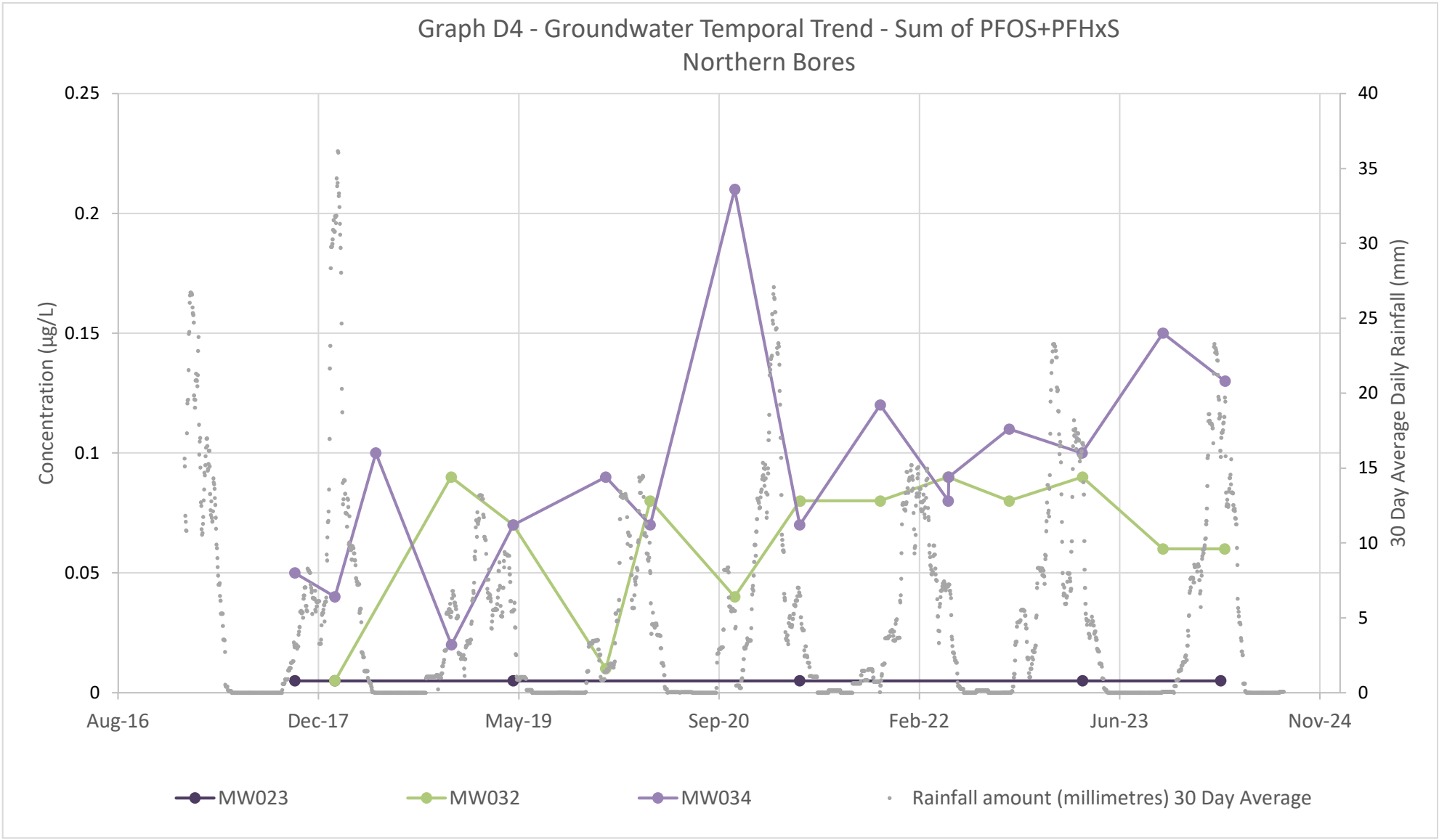
Environmental Standards
HEPA (2025) PFAS NEMP 3.0 Freshwater 99%
HEPA (2025) PFAS NEMP 3.0 Recreational Water

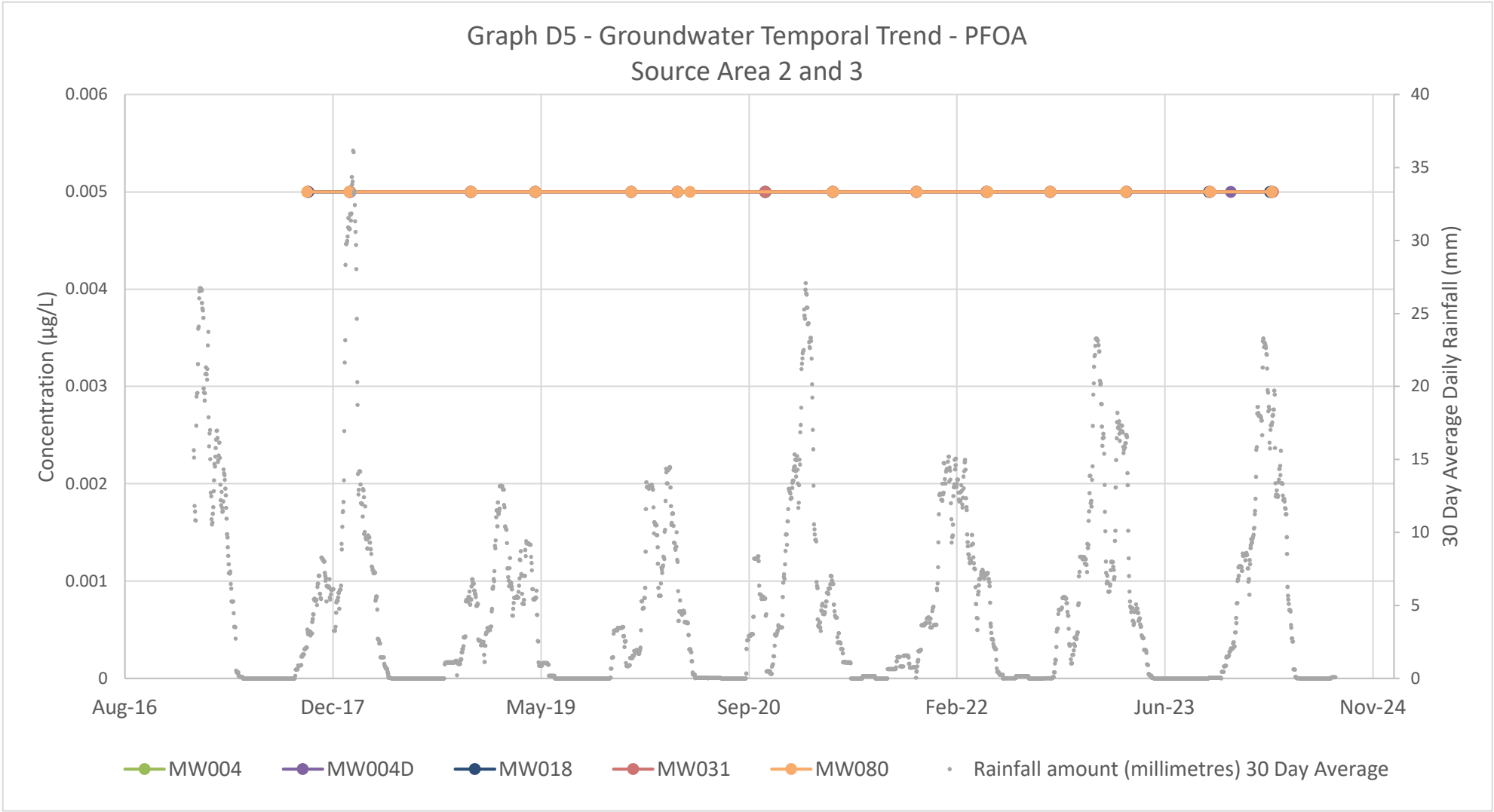
APPENDIX D: TEMPORAL GRAPHS

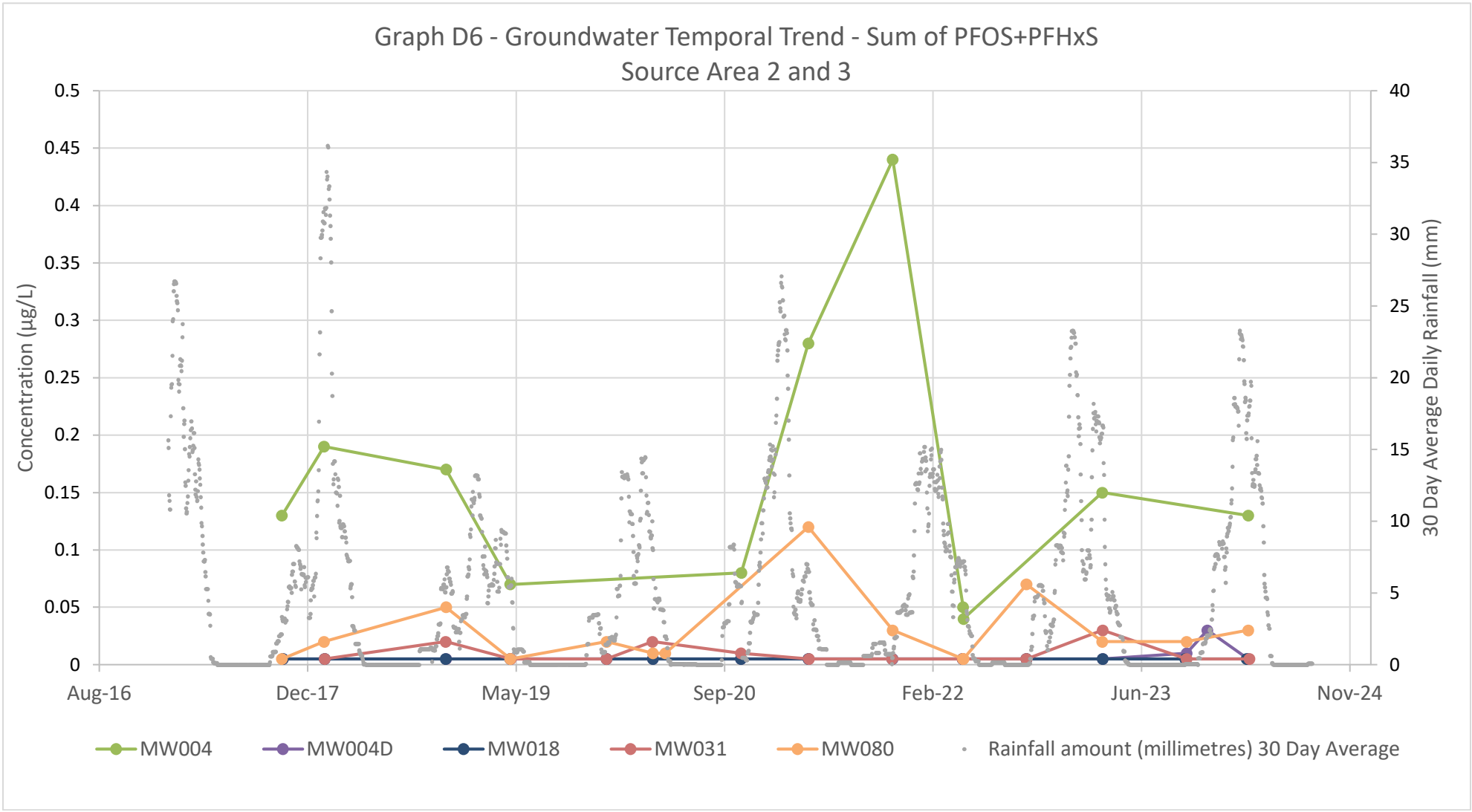

Graph D1 - Groundwater Temporal Trend - PFOA
Source Area 1
Concentration (µg/L)
0.1
0.09
0.08
0.07
0.06
0.05
0.04
0.03
0.02
0.01
0
30 Day Average Daily Rainfall (mm)
40
35
30
25
20
15
10
5
0
Aug-16
Dec-17
May-19
Sep-20
Feb-22
Jun-23
Nov-24
MW012
MW012D
MW021
MW021D
MW066
Rainfall amount (millimetres) 30 Day Average

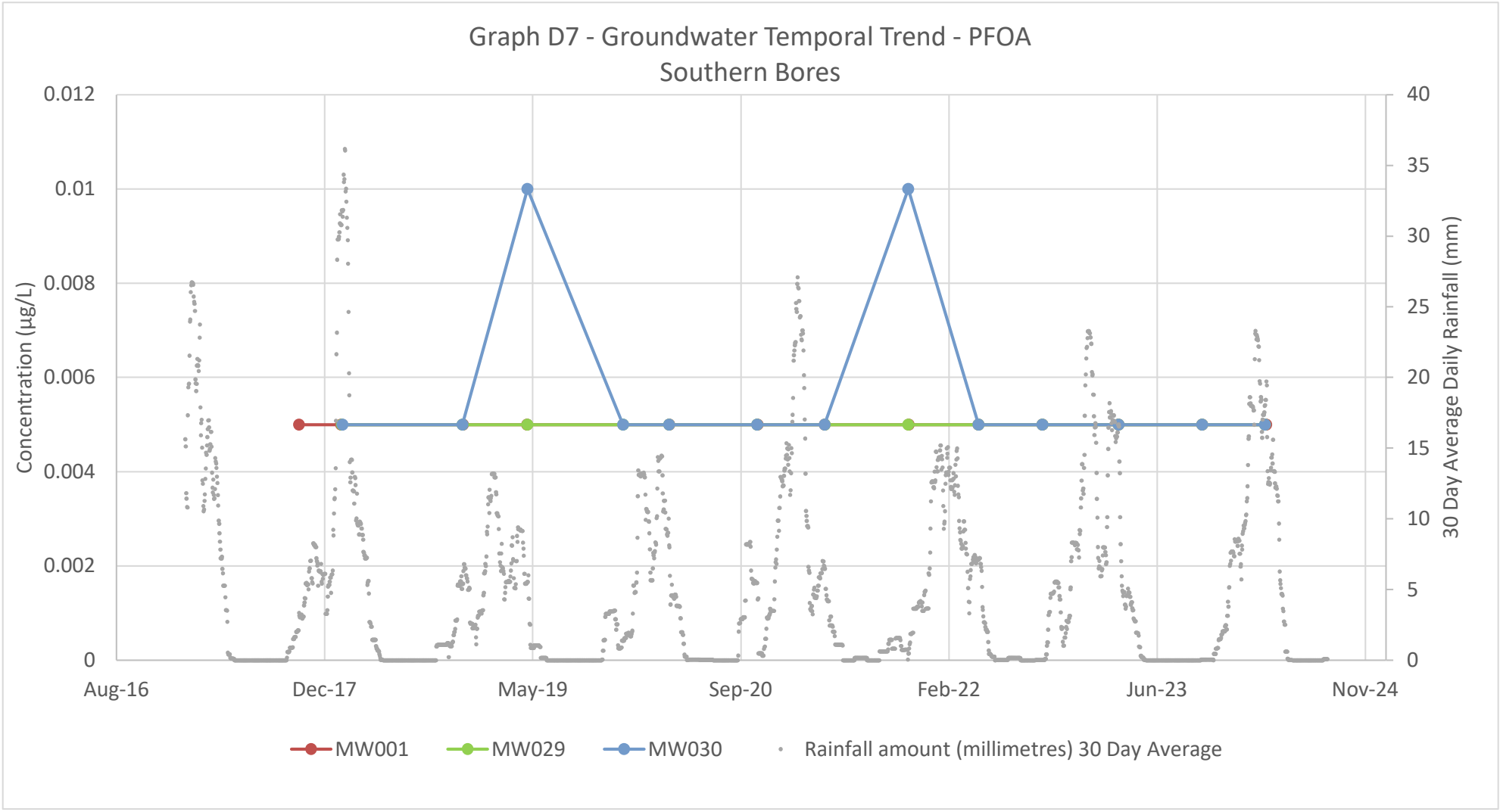

Graph D2 - Groundwater Temporal Trend - Sum of PFOS+PFHxS
Source Area 1
Concentration (µg/L)
30 Day Average Daily Rainfall (mm)
1.8
1.6
1.4
1.2
1
0.8
0.6
0.4
0.2
0
40
35
30
25
20
15
10
5
0
Aug-16
Dec-17
May-19
Sep-20
Feb-22
Jun-23
Nov-24
MW012
MW012D
MW021
MW021D
MW066
Rainfall amount (millimetres) 30 Day Average

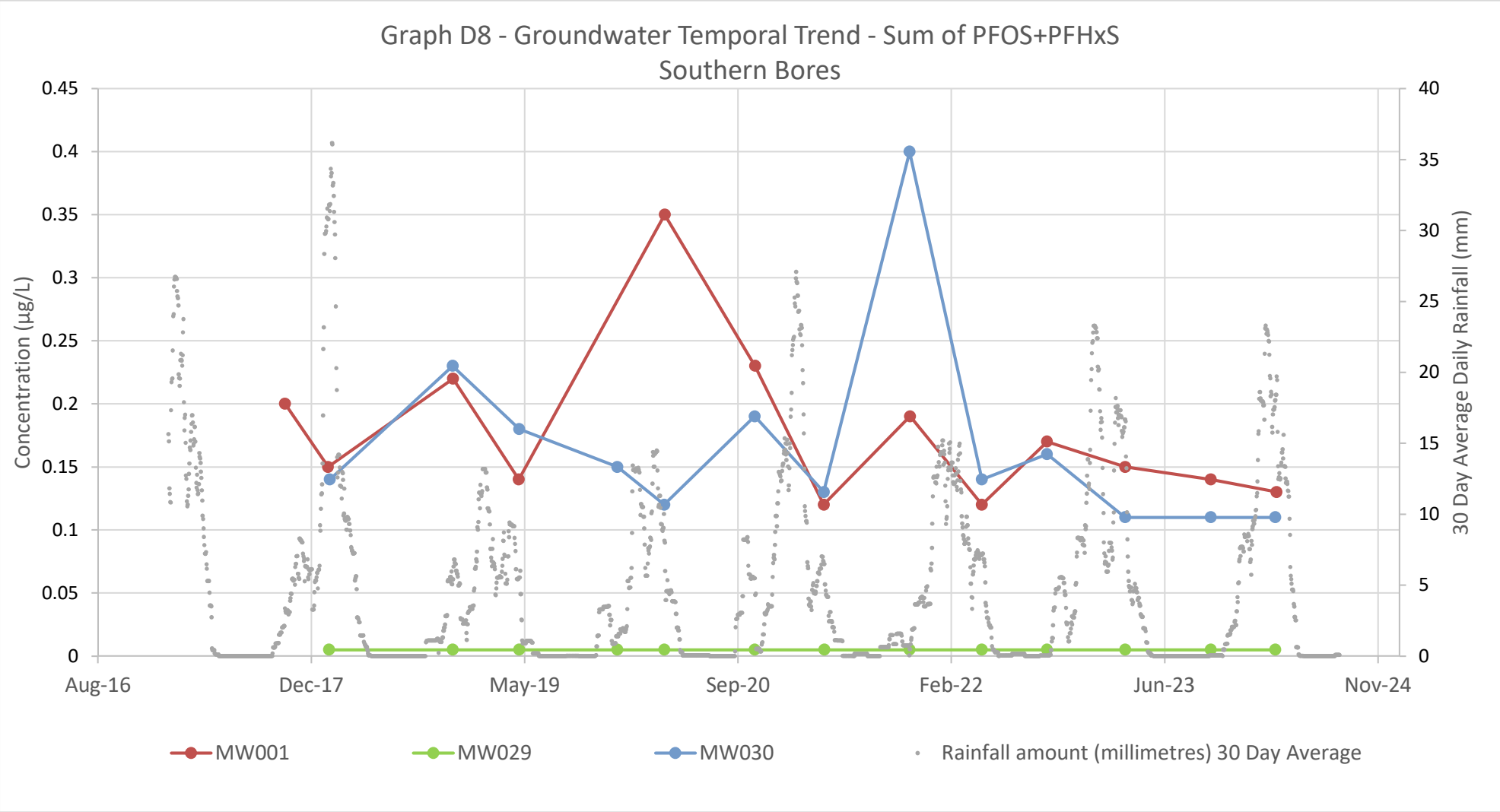

Graph D3 - Groundwater Temporal Trend - PFOA
Northern Bores
Concentration (µg/L)
0.035
0.03
0.025
0.02
0.015
0.01
0.005
0
30 Day Average Daily Rainfall (mm)
40
35
30
25
20
15
10
5
0
Aug-16
Dec-17
May-19
Sep-20
Feb-22
Jun-23
Nov-24
MW023
MW032
MW034
Rainfall amount (millimetres) 30 Day Average

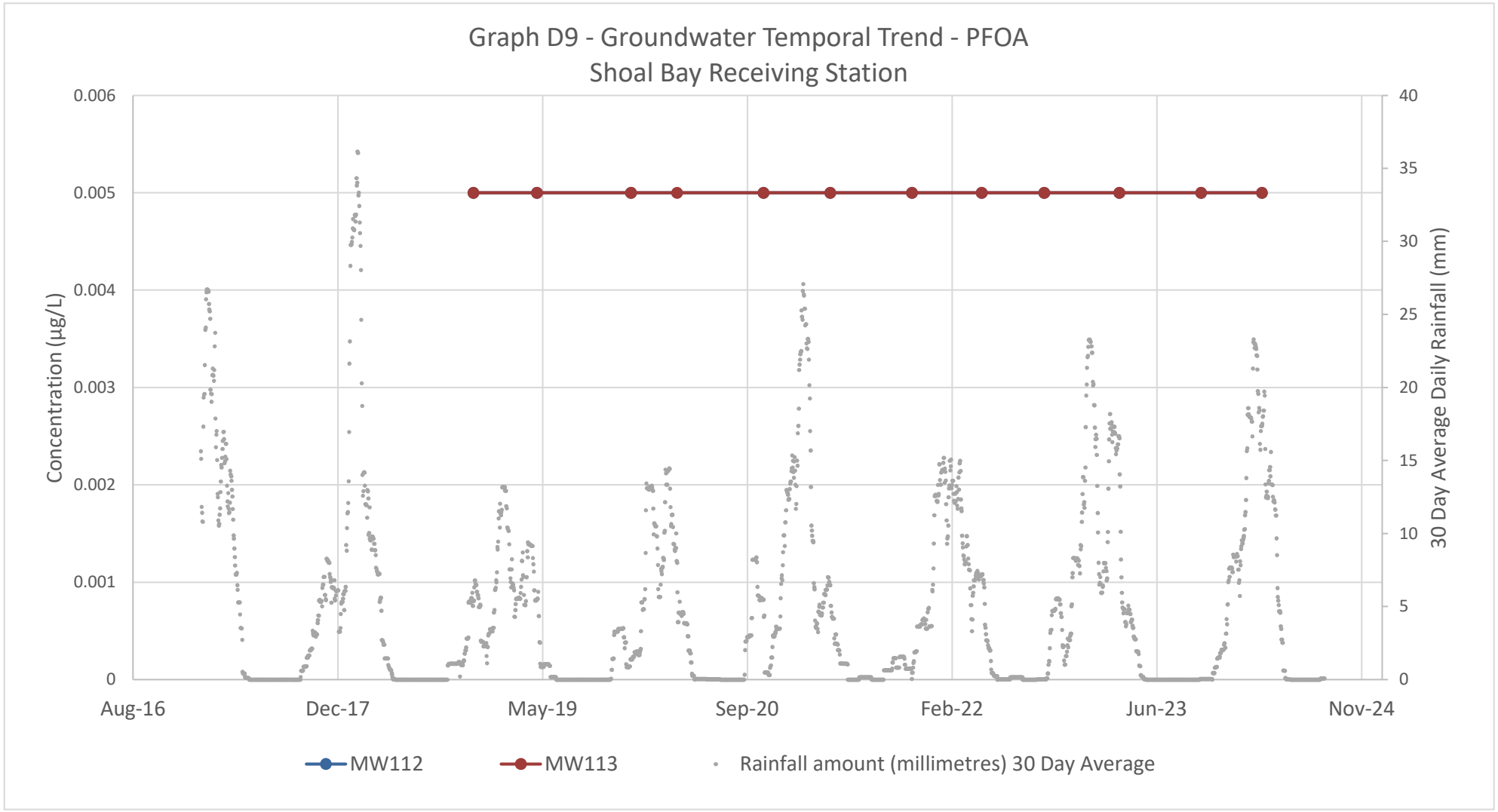

Graph D4 - Groundwater Temporal Trend - Sum of PFOS+PFHxS
Northern Bores
Concentration (µg/L)
0.25
0.2
0.15
0.1
0.05
0
30 Day Average Daily Rainfall (mm)
40
35
30
25
20
15
10
5
0
Aug-16
Dec-17
May-19
Sep-20
Feb-22
Jun-23
Nov-24
MW023
MW032
MW034
Rainfall amount (millimetres) 30 Day Average

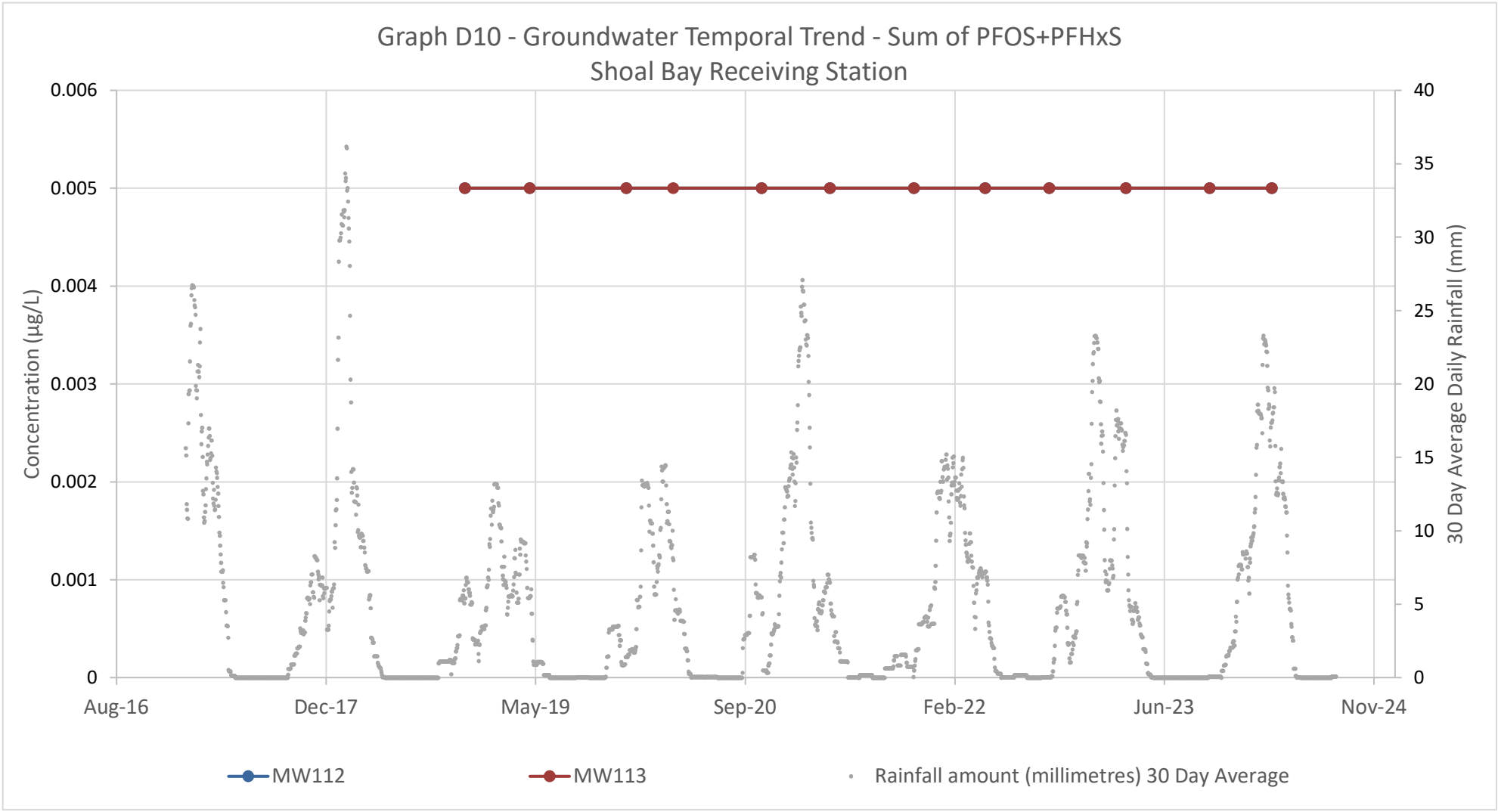

Graph D5 - Groundwater Temporal Trend - PFOA
Source Area 2 and 3
Concentration (µg/L)
0.006
0.005
0.004
0.003
0.002
0.001
0
30 Day Average Daily Rainfall (mm)
40
35
30
25
20
15
10
5
0
Aug-16
Dec-17
May-19
Sep-20
Feb-22
Jun-23
Nov-24
MW004
MW004D
MW018
MW031
MW080
Rainfall amount (millimetres) 30 Day Average


Graph D6 - Groundwater Temporal Trend - Sum of PFOS+PFHxS
Source Area 2 and 3
Concentration (µg/L)
0.5
0.45
0.4
0.35
0.3
0.25
0.2
0.15
0.1
0.05
0
30 Day Average Daily Rainfall (mm)
40
35
30
25
20
15
10
5
0
Aug-16
Dec-17
May-19
Sep-20
Feb-22
Jun-23
Nov-24
MW004
MW004D
MW018
MW031
MW080
Rainfall amount (millimetres) 30 Day Average

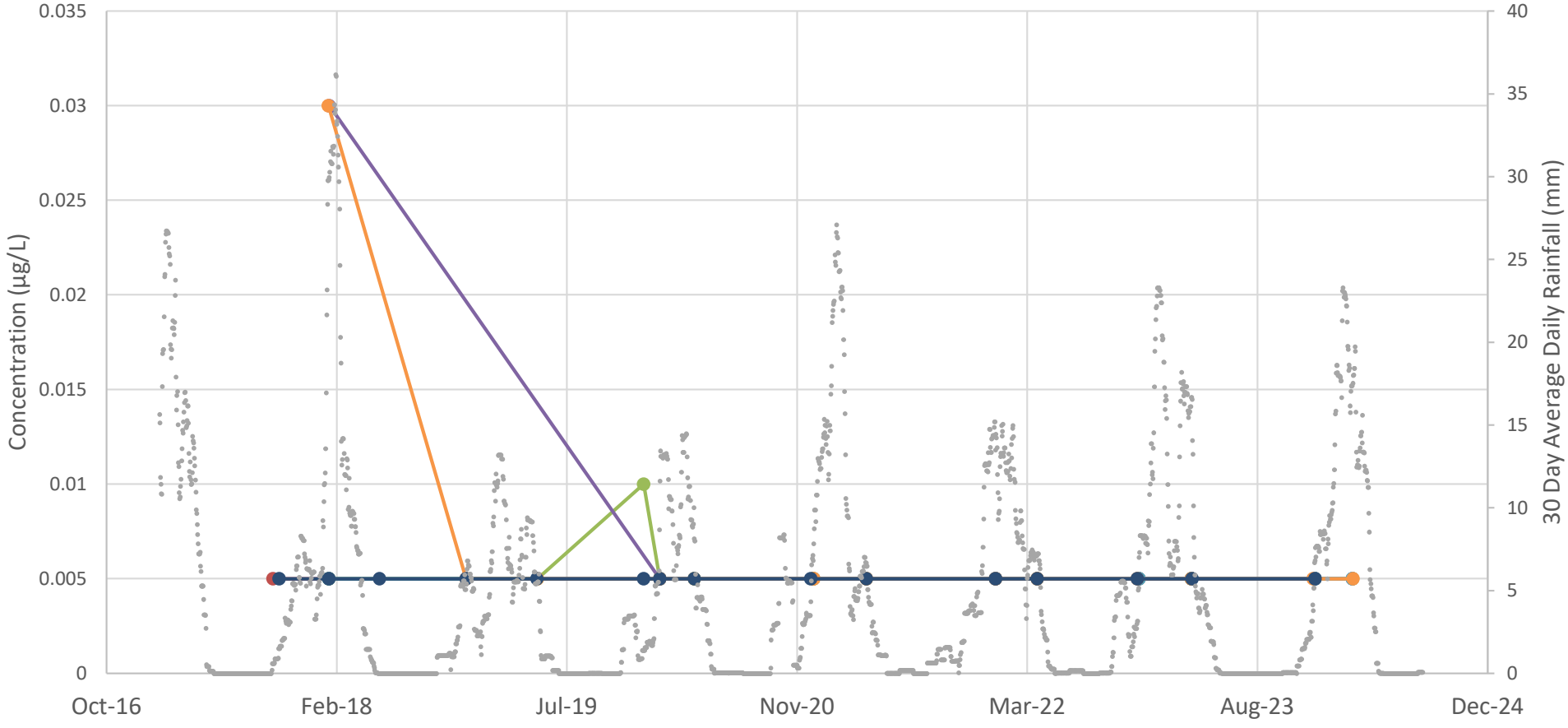

Graph D7 - Groundwater Temporal Trend - PFOA
Southern Bores
Concentration (µg/L)
0.012
0.01
0.008
0.006
0.004
0.002
0
30 Day Average Daily Rainfall (mm)
40
35
30
25
20
15
10
5
0
Aug-16
Dec-17
May-19
Sep-20
Feb-22
Jun-23
Nov-24
MW001
MW029
MW030
Rainfall amount (millimetres) 30 Day Average

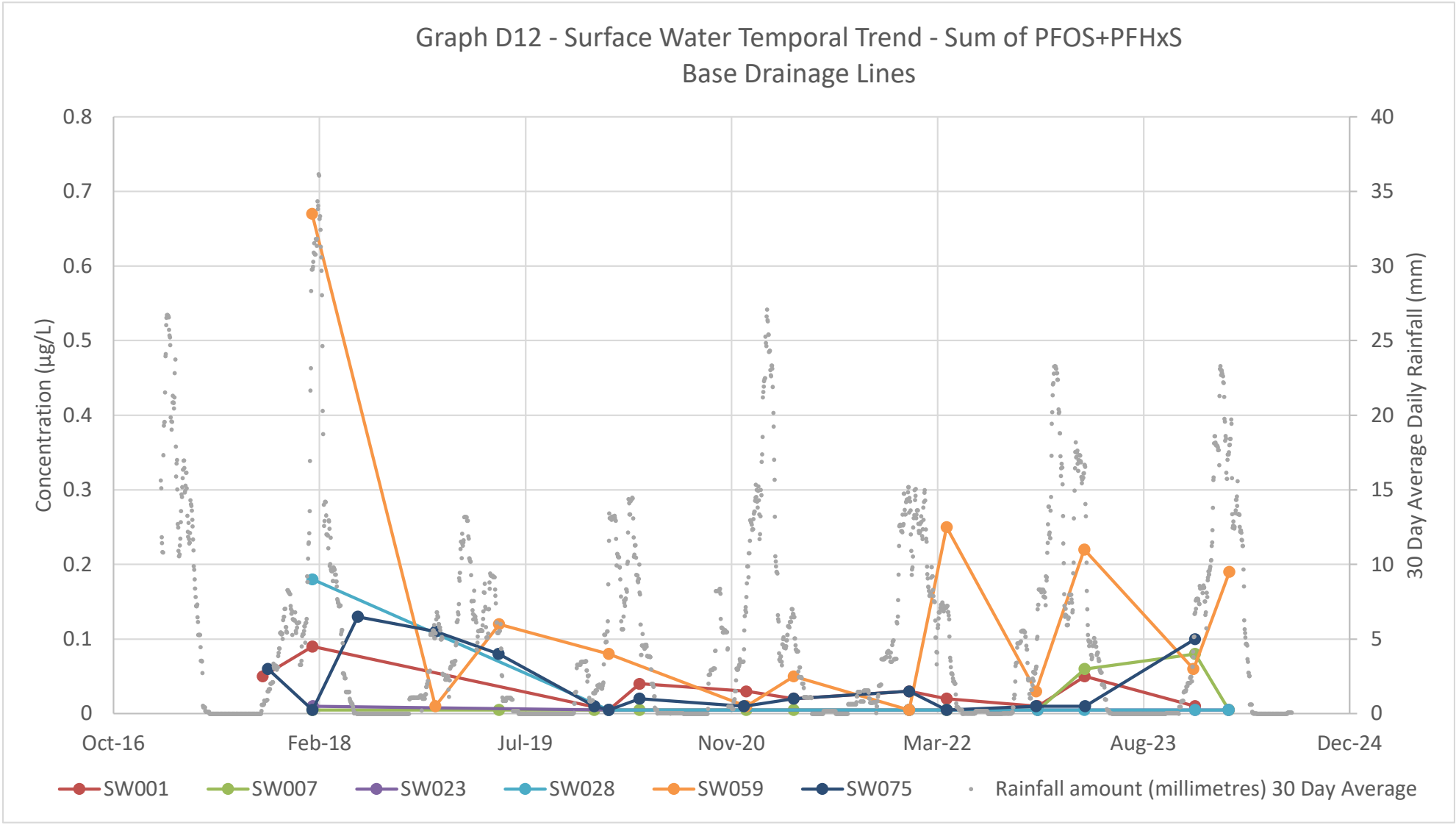

Graph D8 - Groundwater Temporal Trend - Sum of PFOS+PFHxS
Southern Bores
Concentration (µg/L)
0.45
0.4
0.35
0.3
0.25
0.2
0.15
0.1
0.05
0
30 Day Average Daily Rainfall (mm)
40
35
30
25
20
15
10
5
0
Aug-16
Dec-17
May-19
Sep-20
Feb-22
Jun-23
Nov-24
MW001
MW029
MW030
Rainfall amount (millimetres) 30 Day Average

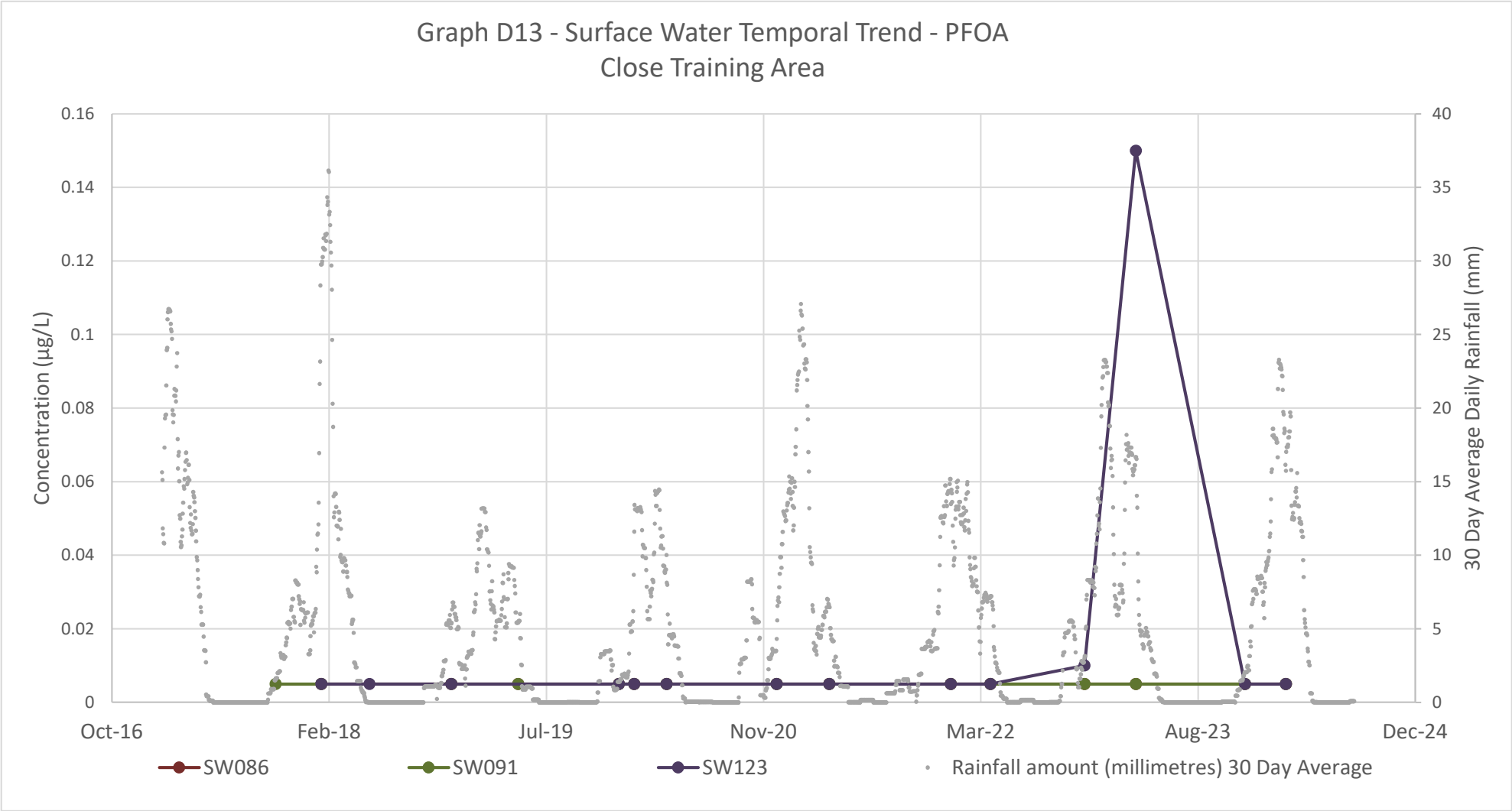

Graph D9 - Groundwater Temporal Trend - PFOA
Shoal Bay Receiving Station
Concentration (µg/L)
0.006
0.005
0.004
0.003
0.002
0.001
0
30 Day Average Daily Rainfall (mm)
40
35
30
25
20
15
10
5
0
Aug-16
Dec-17
May-19
Sep-20
Feb-22
Jun-23
Nov-24
MW112
MW113
Rainfall amount (millimetres) 30 Day Average

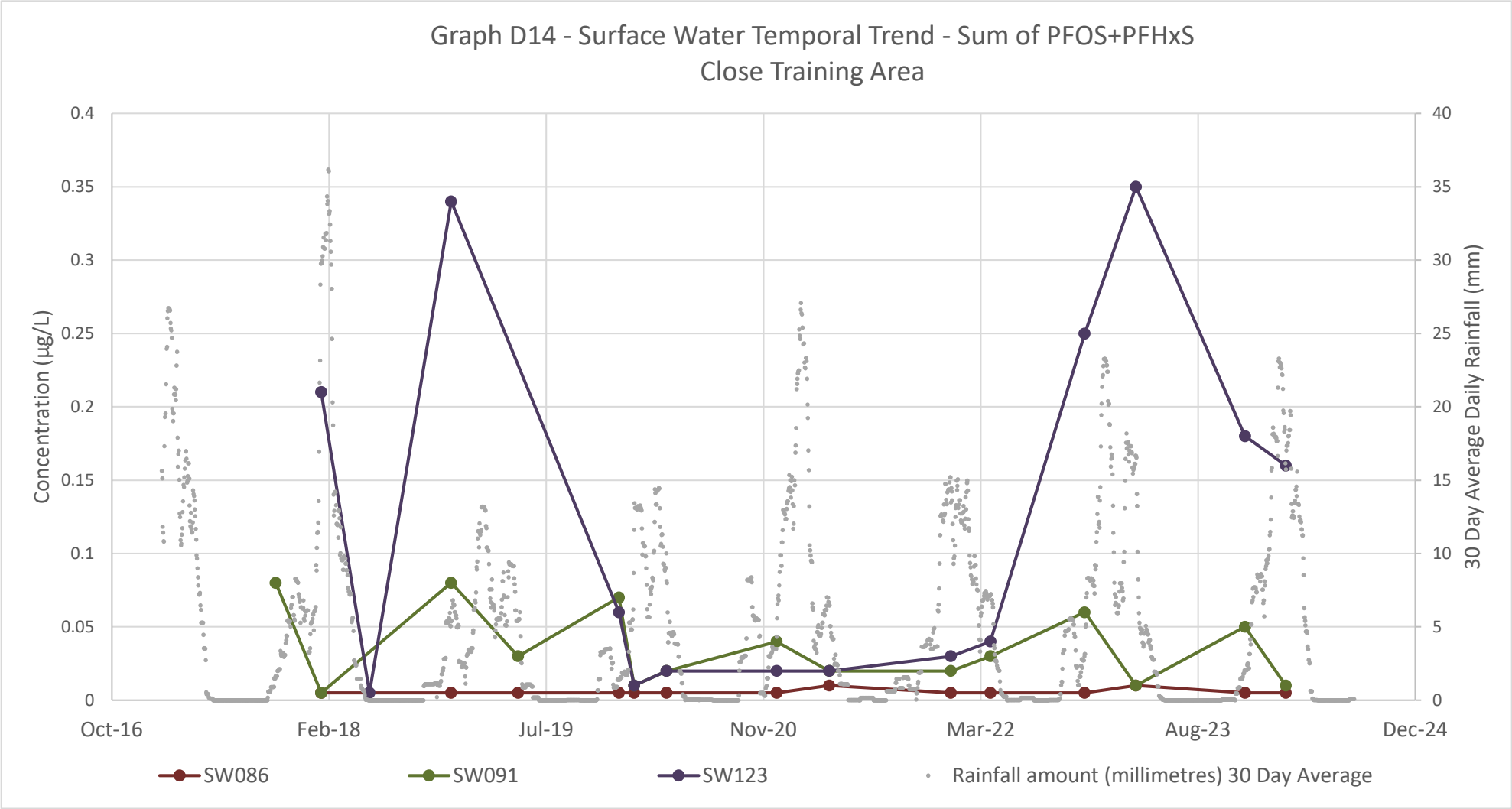

Graph D10 - Groundwater Temporal Trend - Sum of PFOS+PFHxS
Shoal Bay Receiving Station
Concentration (µg/L)
0.006
0.005
0.004
0.003
0.002
0.001
0
30 Day Average Daily Rainfall (mm)
40
35
30
25
20
15
10
5
0
Aug-16
Dec-17
May-19
Sep-20
Feb-22
Jun-23
Nov-24
MW112
MW113
Rainfall amount (millimetres) 30 Day Average

Graph D11 - Surface Water Temporal Trend - PFOA
Base Drainage Lines




Graph D12 - Surface Water Temporal Trend - Sum of PFOS+PFHxS
Base Drainage Lines
Concentration (µg/L)
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
30 Day Average Daily Rainfall (mm)
40
35
30
25
20
15
10
5
0
Oct-16
Feb-18
Jul-19
Nov-20
Mar-22
Aug-23
Dec-24
SW001
SW007
SW023
SW028
SW059
SW075
Rainfall amount (millimetres) 30 Day Average


Graph D13 - Surface Water Temporal Trend - PFOA
Close Training Area
Concentration (µg/L)
0.16
0.14
0.12
0.1
0.08
0.06
0.04
0.02
0
30 Day Average Daily Rainfall (mm)
40
35
30
25
20
15
10
5
0
Oct-16
Feb-18
Jul-19
Nov-20
Mar-22
Aug-23
Dec-24
SW086
SW091
SW123
Rainfall amount (millimetres) 30 Day Average


Graph D14 - Surface Water Temporal Trend - Sum of PFOS+PFHxS
Close Training Area
Concentration (µg/L)
30 Day Average Daily Rainfall (mm)
0.4
0.35
0.3
0.25
0.2
0.15
0.1
0.05
0
40
35
30
25
20
15
10
5
0
Oct-16
Feb-18
Jul-19
Nov-20
Mar-22
Aug-23
Dec-24
SW086
SW091
SW123
Rainfall amount (millimetres) 30 Day Average

APPENDIX E: MANN-KENDALL OUTPUTS

Mann-Kendall Statistical Trend Analysis

Evaluation Date:	2017-2024	**Job ID:**	754-MELEN338204
Region:	Source Area 1	**Constituent:**	PFOA
Conducted by:	Tetra Tech Coffey	**Concentration Units:**	µg/L

Sampling Point ID MW066

Sampling Event	Sampling Date	PFOA µg/L						
1	Nov-17	0.03						
2	Feb-18	0.09						
3	Nov-18	0.02						
4	May-19	0.02						
5	Dec-19	0.01						
6	Apr-20	0.02						
7	Nov-20	0.02						
8	Apr-21	0.02						
9	Nov-21	0.02						
10	Apr-22	0.02						
11	Sep-22	0.02						
12	Mar-23	0.03						
13	Oct-23	0.02						
14	Mar-24	0.02						
15								
16								
17								
18								
19								
20								
21								
22								
23								
24								
Coefficient of Variation:		0.74						
Mann-Kendall Statistics (S):		-9						
Confidence Factor:		46.8%						
Concentration Trend:		Stable						

Notes:

1. *Confidence in Trend = Confidence (in percent) that constituent concentration is increaseing (S>0) or decreasing (S<0): >95% = Increasing or Decreasing; <95% and S>0 = No Trend, <95%, S ≤ 0, and COV ≥ 1 = No Trend; <95% and COV < 1 = Stable.*

2. *Adapted from GSI Mann-Kendall Toolkit (GSI Environmental Inc, www.gsi-net.com). Methodology based on "MAROS: A Decision Support System for Optimizing Monitoring Plans", J.J. Aziz, M. Ling, H.S. Rifai, C.J. Newell and J.R. Gonzales, Ground Water, 41(3):355-367, 2003.*

Mann-Kendall Statistical Trend Analysis

Evaluation Date:	2017-2024	**Job ID:**	754-MELEN338204
Region:	Source Area 1	**Constituent:**	Sum of PFOS+PFHxS
Conducted by:	Tetra Tech Coffey	**Concentration Units:**	µg/L

Sampling Point ID MW066

Sampling Event	Sampling Date	Sum of PFOS+PFHxS µg/L						
1	Nov-17	0.89						
2	Feb-18	1.71						
3	Nov-18	0.55						
4	May-19	0.43						
5	Dec-19	0.33						
6	Apr-20	0.47						
7	Nov-20	0.43						
8	Apr-21	0.51						
9	Nov-21	0.54						
10	Apr-22	0.42						
11	Sep-22	0.53						
12	Mar-23	0.65						
13	Oct-23	0.45						
14	Mar-24	0.34						
15								
16								
17								
18								
19								
20								
21								
22								
23								
24								
Coefficient of Variation:		0.60						
Mann-Kendall Statistics (S):		-22						
Confidence Factor:		77.2%						
Concentration Trend:		Stable						

Notes:

1. *Confidence in Trend = Confidence (in percent) that constituent concentration is increaseing (S>0) or decreasing (S<0): >95% = Increasing or Decreasing; <95% and S>0 = No Trend, <95%, S ≤ 0, and COV ≥ 1 = No Trend; <95% and COV < 1 = Stable.*

2. *Adapted from GSI Mann-Kendall Toolkit (GSI Environmental Inc, www.gsi-net.com). Methodology based on "MAROS: A Decision Support System for Optimizing Monitoring Plans", J.J. Aziz, M. Ling, H.S. Rifai, C.J. Newell and J.R. Gonzales, Ground Water, 41(3):355-367, 2003.*

Mann-Kendall Statistical Trend Analysis

Evaluation Date:	2017-2024	**Job ID:**	754-MELEN338204
Region:	Northern Bores	**Constituent:**	PFOA
Conducted by:	Tetra Tech Coffey	**Concentration Units:**	µg/L

Sampling Point ID MW034

Sampling Event	Sampling Date	PFOA µg/L						
1	Nov-17	0.005						
2	Feb-18	0.015						
3	May-18	0.005						
4	Nov-18	0.005						
5	May-19	0.005						
6	Dec-19	0.01						
7	Apr-20	0.005						
8	Nov-20	0.03						
9	Apr-21	0.005						
10	Nov-21	0.01						
11	Apr-22	0.015						
12	Sep-22	0.005						
13	Mar-23	0.005						
14	Oct-23	0.015						
15	Mar-24	0.005						
16								
17								
18								
19								
20								
21								
22								
23								
24								
Coefficient of Variation:		0.75						
Mann-Kendall Statistics (S):		7						
Confidence Factor:		23.4%						
Concentration Trend:		No Trend						

Notes:

1. *Confidence in Trend = Confidence (in percent) that constituent concentration is increaseing (S>0) or decreasing (S<0): >95% = Increasing or Decreasing; <95% and S>0 = No Trend, <95%, S ≤ 0, and COV ≥ 1 = No Trend; <95% and COV < 1 = Stable.*

2. *Adapted from GSI Mann-Kendall Toolkit (GSI Environmental Inc, www.gsi-net.com). Methodology based on "MAROS: A Decision Support System for Optimizing Monitoring Plans", J.J. Aziz, M. Ling, H.S. Rifai, C.J. Newell and J.R. Gonzales, Ground Water, 41(3):355-367, 2003.*

Mann-Kendall Statistical Trend Analysis

Evaluation Date:	2017-2024	**Job ID:**	754-MELEN338204
Region:	Source Area 1	**Constituent:**	Sum of PFOS+PFHxS
Conducted by:	Tetra Tech Coffey	**Concentration Units:**	µg/L

Sampling Point ID	MW032	MW034					

Sampling Event	Sampling Date	Sum of PFOS+PFHxS µg/L						
1	Nov-17		0.05					
2	Feb-18	0.005	0.04					
3	May-18		0.1					
4	Nov-18	0.09	0.02					
5	May-19	0.07	0.07					
6	Dec-19	0.01	0.09					
7	Apr-20	0.08	0.07					
8	Nov-20	0.04	0.21					
9	Apr-21	0.08	0.07					
10	Nov-21	0.08	0.12					
11	Apr-22	0.09	0.09					
12	Sep-22	0.08	0.11					
13	Mar-23	0.09	0.1					
14	Oct-23	0.06	0.15					
15	Mar-24	0.06	0.13					
16								
17								
18								
19								
20								
21								
22								
23								
24								
Coefficient of Variation:		0.45	0.50					
Mann-Kendall Statistics (S):		14	54					
Confidence Factor:		78.2%	99.7%					
Concentration Trend:		No Trend	Increasing					

Notes:

1. *Confidence in Trend = Confidence (in percent) that constituent concentration is increaseing (S>0) or decreasing (S<0): >95% = Increasing or Decreasing; <95% and S>0 = No Trend, <95%, S ≤ 0, and COV ≥ 1 = No Trend; <95% and COV < 1 = Stable.*

2. *Adapted from GSI Mann-Kendall Toolkit (GSI Environmental Inc, www.gsi-net.com). Methodology based on "MAROS: A Decision Support System for Optimizing Monitoring Plans", J.J. Aziz, M. Ling, H.S. Rifai, C.J. Newell and J.R. Gonzales, Ground Water, 41(3):355-367, 2003.*

Mann-Kendall Statistical Trend Analysis

Evaluation Date:	2017-2024	**Job ID:**	754-MELEN338204
Region:	Source Area2 and 3	**Constituent:**	Sum of PFOS+PFHxS
Conducted by:	Tetra Tech Coffey	**Concentration Units:**	µg/L

Sampling Point ID	MW004	MW080					
Sampling Event	**Sampling Date**	**Sum of PFOS+PFHxS µg/L**						
1	Oct-17	0.13						
2	Feb-18	0.19	0.02					
3	Nov-18	0.17	0.05					
4	May-19	0.07	0.005					
5	Dec-19		0.02					
6	Apr-20		0.01					
7	May-20		0.01					
8	Nov-20	0.08						
9	Apr-21	0.28	0.12					
10	Nov-21	0.44	0.03					
11	Apr-22	0.05	0.005					
12	Sep-22		0.07					
13	Mar-23	0.15	0.02					
14	Oct-23		0.02					
15	Mar-24	0.13	0.03					
16								
17								
18								
19								
20								
21								
22								
23								
24								
Coefficient of Variation:		0.69	1.02					
Mann-Kendall Statistics (S):		-2	9					
Confidence Factor:		53.5%	68.4%					
Concentration Trend:		Stable	No trend					

Notes:

1. *Confidence in Trend = Confidence (in percent) that constituent concentration is increaseing (S>0) or decreasing (S<0): >95% = Increasing or Decreasing; <95% and S>0 = No Trend, <95%, S ≤ 0, and COV ≥ 1 = No Trend; <95% and COV < 1 = Stable.*

2. *Adapted from GSI Mann-Kendall Toolkit (GSI Environmental Inc, www.gsi-net.com). Methodology based on "MAROS: A Decision Support System for Optimizing Monitoring Plans", J.J. Aziz, M. Ling, H.S. Rifai, C.J. Newell and J.R. Gonzales, Ground Water, 41(3):355-367, 2003.*

Mann-Kendall Statistical Trend Analysis

Evaluation Date:	2017-2024	**Job ID:**	754-MELEN338204
Region:	Source Area2 and 3	**Constituent:**	Sum of PFOS+PFHxS
Conducted by:	Tetra Tech Coffey	**Concentration Units:**	µg/L

Sampling Point ID	MW001	MW030					

Sampling Event	Sampling Date	Sum of PFOS+PFHxS µg/L						
1	Oct-17	0.2						
2	Feb-18	0.15	0.14					
3	Nov-18	0.22	0.23					
4	May-19	0.14	0.18					
5	Dec-19		0.15					
6	Apr-20	0.35	0.12					
7	Nov-20	0.23	0.19					
8	Apr-21	0.12	0.13					
9	Nov-21	0.19	0.4					
10	Apr-22	0.12	0.14					
11	Sep-22	0.17	0.16					
12	Mar-23	0.15	0.11					
13	Oct-23	0.14	0.11					
14	Mar-24	0.13	0.11					
15								
16								
17								
18								
19								
20								
21								
22								
23								
24								
Coefficient of Variation:		0.36	0.47					
Mann-Kendall Statistics (S):		-27	-30					
Confidence Factor:		94.3%	96.2%					
Concentration Trend:		Stable	Decreasing					

Notes:

1. *Confidence in Trend = Confidence (in percent) that constituent concentration is increaseing (S>0) or decreasing (S<0): >95% = Increasing or Decreasing; <95% and S>0 = No Trend, <95%, S ≤ 0, and COV ≥ 1 = No Trend; <95% and COV < 1 = Stable.*

2. *Adapted from GSI Mann-Kendall Toolkit (GSI Environmental Inc, www.gsi-net.com). Methodology based on "MAROS: A Decision Support System for Optimizing Monitoring Plans", J.J. Aziz, M. Ling, H.S. Rifai, C.J. Newell and J.R. Gonzales, Ground Water, 41(3):355-367, 2003.*

Mann-Kendall Statistical Trend Analysis

Evaluation Date:	2017-2024	**Job ID:**	754-MELEN338204
Region:	Surface water - Base Drainage	**Constituent:**	Sum of PFOS+PFHxS
Conducted by:	Tetra Tech Coffey	**Concentration Units:**	µg/L

Sampling Point ID	SW001	SW007	SW059	SW075			

Sampling Event	Sampling Date	Sum of PFOS+PFHxS µg/L						
1	Oct-17	0.05			0.06			
2	Feb-18	0.09	0.005	0.67	0.005			
3	May-18				0.13			
4	Nov-18			0.01	0.11			
5	Apr-19				0.08			
6	May-19		0.005	0.12				
7	Dec-19		0.005		0.01			
8	Jan-20	0.005	0.005	0.08	0.005			
9	Apr-20	0.04	0.005		0.02			
10	Dec-20	0.03	0.005	0.01	0.01			
11	Apr-21	0.02	0.005	0.05	0.02			
12	Jan-22	0.03	0.005	0.005	0.03			
13	Apr-22	0.02	0.005	0.25	0.005			
14	Nov-22	0.01	0.005	0.03	0.01			
15	Mar-23	0.05	0.06	0.22	0.01			
16	Dec-23	0.01	0.08	0.06	0.1			
17								
18								
19								
20								
21								
22								
23								
24								
Coefficient of Variation:		0.76	1.62	1.43	1.08			
Mann-Kendall Statistics (S):		-19	21	-4	-15			
Confidence Factor:		91.8%	91.3%	59.0%	75.2%			
Concentration Trend:		Stable	Stable	No Trend	No Trend			

Notes:

1. *Confidence in Trend = Confidence (in percent) that constituent concentration is increaseing (S>0) or decreasing (S<0): >95% = Increasing or Decreasing; <95% and S>0 = No Trend, <95%, S ≤ 0, and COV ≥ 1 = No Trend; <95% and COV < 1 = Stable.*

2. *Adapted from GSI Mann-Kendall Toolkit (GSI Environmental Inc, www.gsi-net.com). Methodology based on "MAROS: A Decision Support System for Optimizing Monitoring Plans", J.J. Aziz, M. Ling, H.S. Rifai, C.J. Newell and J.R. Gonzales, Ground Water, 41(3):355-367, 2003.*

Mann-Kendall Statistical Trend Analysis

Evaluation Date:	2017-2024	**Job ID:**	754-MELEN338204
Region:	Surface water - CTA	**Constituent:**	Sum of PFOS+PFHxS
Conducted by:	Tetra Tech Coffey	**Concentration Units:**	µg/L

Sampling Point ID	SW091	SW123					

Sampling Event	Sampling Date	Sum of PFOS+PFHxS µg/L						
1	Oct-17	0.08						
2	Feb-18	0.005	0.21					
3	May-18		0.005					
4	Nov-18	0.08	0.34					
5	Apr-19	0.03						
6	Dec-19	0.07	0.06					
7	Jan-20	0.01	0.01					
8	Apr-20	0.02	0.02					
9	Dec-20	0.04	0.02					
10	Apr-21	0.02	0.02					
11	Jan-22	0.02	0.03					
12	Apr-22	0.03	0.04					
13	Nov-22	0.06	0.25					
14	Mar-23	0.01	0.35					
15	Nov-23	0.05	0.18					
16								
17								
18								
19								
20								
21								
22								
23								
24								
Coefficient of Variation:		0.70	1.10					
Mann-Kendall Statistics (S):		-9	23					
Confidence Factor:		66.6%	90.8%					
Concentration Trend:		Stable	Stable					

Notes:

1. *Confidence in Trend = Confidence (in percent) that constituent concentration is increaseing (S>0) or decreasing (S<0): >95% = Increasing or Decreasing; <95% and S>0 = No Trend, <95%, S ≤ 0, and COV ≥ 1 = No Trend; <95% and COV < 1 = Stable.*

2. *Adapted from GSI Mann-Kendall Toolkit (GSI Environmental Inc, www.gsi-net.com). Methodology based on "MAROS: A Decision Support System for Optimizing Monitoring Plans", J.J. Aziz, M. Ling, H.S. Rifai, C.J. Newell and J.R. Gonzales, Ground Water, 41(3):355-367, 2003.*

APPENDIX F: LIMITATIONS

IMPORTANT INFORMATION ABOUT YOUR TETRA TECH COFFEY ENVIRONMENTAL REPORT

Introduction

This report has been prepared by Tetra Tech Coffey for you, as Tetra Tech Coffey's client, in accordance with our agreed purpose, scope, schedule and budget.

The report has been prepared using accepted procedures and practices of the consulting profession at the time it was prepared, and the opinions, recommendations and conclusions set out in the report are made in accordance with generally accepted principles and practices of that profession.

The report is based on information gained from environmental conditions (including assessment of some or all of soil, groundwater, vapour and surface water) and supplemented by reported data of the local area and professional experience. Assessment has been scoped with consideration to industry standards, regulations, guidelines and your specific requirements, including budget and timing. The characterisation of site conditions is an interpretation of information collected during assessment, in accordance with industry practice.

This interpretation is not a complete description of all material on or in the vicinity of the site, due to the inherent variation in spatial and temporal patterns of contaminant presence and impact in the natural environment. Tetra Tech Coffey may have also relied on data and other information provided by you and other qualified individuals in preparing this report. Tetra Tech Coffey has not verified the accuracy or completeness of such data or information except as otherwise stated in the report. For these reasons the report must be regarded as interpretative, in accordance with industry standards and practice, rather than being a definitive record.

Your report has been written for a specific purpose

Your report has been developed for a specific purpose as agreed by us and applies only to the site or area investigated. Unless otherwise stated in the report, this report cannot be applied to an adjacent site or area, nor can it be used when the nature of the specific purpose changes from that which we agreed.

For each purpose, a tailored approach to the assessment of potential soil and groundwater contamination is required. In most cases, a key objective is to identify, and if possible quantify, risks that both recognised and potential contamination pose in the context of the agreed purpose. Such risks may be financial (for example, clean up costs or constraints on site use) and/or physical (for example, potential health risks to users of the site or the general public).

Limitations of the Report

The work was conducted, and the report has been prepared, in response to an agreed purpose and scope, within time and budgetary constraints, and in reliance on certain data and information made available to Tetra Tech Coffey.

The analyses, evaluations, opinions and conclusions presented in this report are based on that purpose and scope, requirements, data or information, and they could change if such requirements or data are inaccurate or incomplete.

This report is valid as of the date of preparation. The condition of the site (including subsurface conditions) and extent or nature of contamination or other environmental hazards can change over time, as a result of either natural processes or human influence. Tetra Tech Coffey should be kept appraised of any such events and should be consulted for further investigations if any changes are noted, particularly during construction activities where excavations often reveal subsurface conditions.

In addition, advancements in professional practice regarding contaminated land and changes in applicable statues and/or guidelines may affect the validity of this report. Consequently, the currency of conclusions and recommendations in this report should be verified if you propose to use this report more than 6 months after its date of issue.

The report does not include the evaluation or assessment of potential geotechnical engineering constraints of the site.

Interpretation of factual data

Environmental site assessments identify actual conditions only at those points where samples are taken and on the date collected. Data derived from indirect field measurements, and sometimes other reports on the site, are interpreted by geologists, engineers or scientists to provide an opinion about overall site conditions, their likely impact with respect to the report purpose and recommended actions.

Variations in soil and groundwater conditions may occur between test or sample locations and actual conditions may differ from those inferred to exist. No environmental assessment program, no matter how comprehensive, can reveal all subsurface details and anomalies. Similarly, no professional, no matter how well qualified, can reveal what is hidden by earth, rock or changed through time.

The actual interface between different materials may be far more gradual or abrupt than assumed based on the facts obtained. Nothing can be done to change the actual site conditions which exist, but steps can be taken to reduce the impact of unexpected conditions.

For this reason, parties involved with land acquisition, management and/or redevelopment should retain the services of a suitably qualified and experienced environmental consultant through the development and use of the site to identify variances, conduct additional tests if required, and recommend solutions to unexpected conditions or other unrecognised features encountered on site. Tetra Tech Coffey would be pleased to assist with any investigation or advice in such circumstances.

Recommendations in this report

This report assumes, in accordance with industry practice, that the site conditions recognised through discrete sampling are representative of actual conditions throughout the investigation area. Recommendations are based on the resulting interpretation.

Should further data be obtained that differs from the data on which the report recommendations are based (such as through excavation or other additional assessment), then the recommendations would need to be reviewed and may need to be revised.

Report for benefit of client

Unless otherwise agreed between us, the report has been prepared for your benefit and no other party. Other parties should not rely upon the report or the accuracy or completeness of any recommendation and should make their own enquiries and obtain independent advice in relation to such matters.

Tetra Tech Coffey assumes no responsibility and will not be liable to any other person or organisation for, or in relation to, any matter dealt with or conclusions expressed in the report, or for any loss or damage suffered by any other person or organisation arising from matters dealt with or conclusions expressed in the report.

To avoid misuse of the information presented in your report, we recommend that Tetra Tech Coffey be consulted before the report is provided to another party who may not be familiar with the background and the purpose of the report. In particular, an environmental disclosure report for a property vendor may not be suitable for satisfying the needs of that property's purchaser. This report should not be applied for any purpose other than that stated in the report.

Interpretation by other professionals

Costly problems can occur when other professionals develop their plans based on misinterpretations of a report. To help avoid misinterpretations, a suitably qualified and experienced environmental consultant should be retained to explain the implications of the report to other professionals referring to the report and then review plans and specifications produced to see how other professionals have incorporated the report findings.

Given Tetra Tech Coffey prepared the report and has familiarity with the site, Tetra Tech Coffey is well placed to provide such assistance. If another party is engaged to interpret the recommendations of the report, there is a risk that the contents of the report may be misinterpreted and Tetra Tech Coffey disowns any responsibility for such misinterpretation.

Data should not be separated from the report

The report as a whole presents the findings of the site assessment and the report should not be copied in part or altered in any way. Logs, figures, laboratory data, drawings, etc. are customarily included in our reports and are developed by scientists or engineers based on their interpretation of field logs, field testing and laboratory evaluation of samples. This information should not under any circumstances be redrawn for inclusion in other documents or separated from the report in any way.

This report should be reproduced in full. No responsibility is accepted for use of any part of this report in any other context or for any other purpose or by third parties.

Responsibility

Environmental reporting relies on interpretation of factual information using professional judgement and opinion and has a level of uncertainty attached to it, which is much less exact than other design disciplines. This has often resulted in claims being lodged against consultants, which are unfounded. As noted earlier, the recommendations and findings set out in this report should only be regarded as interpretive and should not be taken as accurate and complete information about all environmental media at all depths and locations across the site.