Appendix J

OMP Sampling Event Reports

PFAS OMP Quarterly Sampling Event Factual Report

December 2023

HMAS Stirling

304700525



Prepared for
Department of Defence

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now

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Chemical Names

DO	Dissolved Oxygen
PFAS	Per- and Poly-fluoroalkyl Substances
PFHxS	Per-fluorohexane Sulfonate
PFOA	Per-fluorooctanoic Acid
PFOS	Per-fluorooctane Sulfonate

Technical Terms

AFFF	Aqueous Film Forming Foam
AHD	Australian Height Datum
AS	Australian Standard
BGL	Below Ground Level
CEC	Cation Exchange Capacity
COC	Chain of Custody
DQI	Data Quality Indicator
DQO	Data Quality Objective
DSI	Detailed Site Investigation
DWER	Department of Water and Environmental Regulation
EC	Electrical Conductivity
EPA	Environment Protection Authority
ERA	Ecological Risk Assessment
ESA	Environmental Site Assessment
HEPA	Heads of Environmental Protection Authority
LOR	Limit of Reporting
N/A	Not Applicable
NATA	National Association of Testing Authorities
NEPC	National Environment Protection Council
NEMP	National Environmental Management Plan
NEPM	National Environmental Protection Measure
ORP	Oxidation Reduction Potential
PSI	Preliminary Site Investigation
QA	Quality Assurance
QC	Quality Control
RPD	Relative Percentage Difference
RWL	Reduced water levels
SAQP	Sampling and Analysis Quality Plan
SWL	Standing water level

Units

ha	Hectares
mAHD	Metres relative to the Australia Height Datum
mBGL	Metres Below Ground Level
mbTOC	Metres below Top of Casing
mg/kg	Milligram per Kilogram (approximately equivalent to ppm)
mg/L	Milligram per Litre
mV	Millivolt
µg/L	Microgram per Litre
µS/cm	Micro Siemens per Centimetre (Electrical Conductivity – Water)

Site Specific

OMP	Ongoing Monitoring Plan
FTA	Fire Training Area
HSF	Helicopter Support Facility

1 Introduction

1.1 Background

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

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

> Cardno, December 2023, Reference: DEF19009, *PFAS Ongoing Monitoring Plan Sampling and Analysis Quality Plan (SAQP) HMAS Stirling.* Rev 12.

The SAQP was reviewed and updated prior to the Q4 2023 monitoring event, and the following change was made:

> MW172 was removed as this monitoring well is no longer accessible.

For the purposes of this report:

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

1.2 Purpose & Objectives

The objective of the OMP is to assess the changes in the nature and extent of PFAS within the environment, specifically where there is an identified potentially elevated risk to a receptor or a potential future risk to a receptor associated with Defence's historical use of legacy Aqueous Film Forming Foam (AFFF). The PFAS source areas are shown on Figure 1B, Appendix A.

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

The objectives of the report are to provide:

> A succinct summary of the Q4 2023 sampling event and provision of analytical results with supporting tables and figures.

> Confirmation of the current understanding of risk.

> Supporting data for the assessment of management actions, where relevant.

1.3 Relevant Guidelines

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

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

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

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

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

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

[1] It is acknowledged that AS4482 has been withdrawn, it is referred to here as a state of knowledge only.

- Department of Water and Environmental Regulation (DWER), 2021, *Assessment and Management of Contaminated Sites*[2].
- Department of Defence, Department of Energy, 2018, *Quality System Manual Schedule B15*.
- U.S. Environmental Protection Agency (EPA), 2000, *Guidance for the Data Quality Objectives Process (EPA QA/G-4)*.
- U.S. EPA, 2002, *Guidance on Environmental Data Verification and Data Validation (EPA QA/G-8)*.
- National Health and Medical Research Council (NHMRC), August 2019, *Guidance on Per and Polyfluoroalkyl Substances (PFAS) in Recreational Water*.

2 Scope of Work

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

2.1 Groundwater Monitoring

Sampling of selected groundwater monitoring wells was performed in general accordance with the SAQP (Cardno, 2023), applying methods set out in Section 3.1 of this report. The groundwater wells monitored as part of the OMP are presented in Table 2-1, and are shown on Figures 2A and 2B, Appendix A.

Table 2-1 Groundwater Monitoring Locations

Monitoring Area	Location ID	No.
Demolition Ground	MW139, MW141, MW142, MW147, MW149	5
Fire Training Area	MW109, MW112, MW500, MW120, MW121, MW123, MW124, MW125, MW126, MW127, MW128	11
Wastewater treatment plant	MW158, MW161, MW166, MW171, MW173, MW193, MW195D, MW195S, MW196, MW197, MW199, MW200, MW202, MW203	14
Accommodation Area	MW288, MW289	2
Dredged Sediments	MW268, MW269	2
AVCAT Storage and Fuel Farm	MW233, MW236, MW238, MW239, MW240, MW242, MW243, MW245, MW249, MW496, MW516	11
Fire Station, Flammable / Hazardous Goods and Waste Storage, Ship Sullage	MW255, MW256, MW257, MW258, MW259	5
Helicopter Support Facility	MW214, MW215, MW216, MW217, MW220, MW224, MW225, MW226, MW227, MW228, MW282	11

2.2 Porewater, Surface Water and Sediment Monitoring

Porewater, sediment and surface water sampling were performed in general accordance with the SAQP (Cardno, 2023), applying methods set out in Sections 3.2 and 3.3 of this report. The porewater, surface water and sediment monitoring locations monitored as part of the OMP are presented in Table 2-2, and are shown on Figures 3A to 5B, Appendix A.

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

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

Monitoring Area	Porewater Sampling Location ID	No.	Sediment Sampling Location ID	No.	Surface Water Sampling Location ID	No.
Demolition Ground	PW329, PW330, PW331, PW356, PW357, PW358	6	SD329, SD330, SD331, SD356, SD357, SD358	6	SW150, SW152, SW154, SW156	4
Fire Training Area	PW335, PW340, PW341, PW362, PW363, PW364	6	SD335, SD340, SD341, SD362, SD363, SD364	6	SW130, SW132, SW134	3
WWTP	PW304, PW345, PW367, PW368, PW369, PW350, PW351, PW352, PW380, PW381, PW401	11	SD304, SD345, SD367, SD368, SD369, SD350, SD351, SD352, SD380, SD381, SD401	11	SW305, SW370, SW371, SW372, SW373, SW353, SW382, SW383, SW384	9
Accommodation Area	PW346	1	SD346	1		
Dredged Sediments	PW374, PW375, PW378	3	SD374, SD375, SD378	3	SW317, SW318, SW319	3
Helicopter Support Facility	PW306, PW307, PW308, PW314, PW315, PW316, PW405, PW407, PW409, PW411, PW413, PW415	12	SD306, SD307, SD308, SD314, SD315, SD316, SD405, SD407, SD409, SD411, SD413, SD415	12	SW309, SW310, SW311, SW406, SW408, SW410, SW412, SW414, SW416	9

2.3 Data Management

All the data included in the report has been collected, uploaded, and reviewed according to the data management requirements of the *Defence Contamination Management Manual* (DCMM) Annex L (Defence, 2021), including:

- The sample naming convention detailed in the DCMM Annex L was used in the field;
- All field data collected was uploaded to the ESdat database;
- Laboratory data was uploaded and approved; and
- QA/QC data was reconciled.

2.4 Deviations from the OMP SAQP

Deviations from the SAQP for the Q4 2023 monitoring event are presented in Table 2-3 below.

Table 2-3 Deviations from OMP SAQP

Location	Deviation	Comments/Impact
MW161	Not sampled	Well dry or blocked. Limited impact, well has historically been sampled quarterly, nearby wells were sampled.
MW195S, MW196	Not sampled	Wells found dry. Medium impact, wells often found dry, no data obtained.
MW197	Not sampled	Well casing silted up, unable to unblock with a steel bailer due to the size of PVC casing (too narrow). Limited impact, this well was found dry during most monitoring events, nearby wells were sampled.
MW214	Not sampled	Well found dry. Limited impact, well is often found dry, nearby wells were sampled.
MW239	Not sampled for non-PFAS analytes, no field parameters recorded	Insufficient water in HydraSleeve® to fill out all sampling bottles or take field readings. No impact, non-PFAS analytes or field parameters do not drive PFAS OMP risk-based decisions/triggers response.

3 Methodology

3.1 Groundwater Sampling Methodology

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

Table 3-1 Groundwater Sampling Methodology

Activity	Details
Well Gauging	Standing water levels (SWL) were gauged using a dip meter. All wells were measured against a surveyed mark at the top of the well casing. Time of gauging was recorded on field records sheets.
Groundwater Field Parameters	Groundwater physicochemical parameters were recorded via a water quality meter from water remaining in the HydraSleeves® after samples are collected or hand-bailed water. The following physicochemical parameters were recorded: ▪ pH ▪ electrical conductivity (EC) ▪ oxidation reduction potential (ORP) ▪ Dissolved oxygen (DO) ▪ Temperature Once physicochemical parameters had stabilised (as indicated by at least three consecutive measurements falling within +/- 10% of each other) measurements were recorded on field data records. All field instruments (e.g. water quality meter) were calibrated by the equipment supplier and bump tested daily to optimise the accuracy of the measurements taken. Calibration certificates and bump test records are provided in Appendix D.
Deployment of HydraSleeve®	HydraSleeve® were deployed with top weight for sample collection to begin at the lowest point. Following Q4 2023 sampling, new HydraSleeve® were deployed in preparation for the next OMP monitoring event scheduled for Q1 2024, using the same string for consistency (same depth of sampling i.e. within screen depth).
Retrieval of HydraSleeve® (Sample Collection)	HydraSleeve® sampling devices were left in wells for a minimum of 24 hours to allow restabilisation of the well following the slight disturbance caused by sampler deployment. HydraSleeve® used during Q4 2023 were the ones deployed following Q3 2023. Samples were collected via continuous pull method at a rate allowing the water to pass through the check value into the sample sleeve. Samples were discharged immediately (minimise changes in chemistry) via discharge tube.
Hand bailing (alternative sampling method)	Disposable HDPE hand bailers, attached to a polypropylene string, were used at wells where the water column wasn't sufficient to fill the HydraSleeve®. Purging of the well was undertaken prior to sampling to ensure that a sample representative of the aquifer is taken (i.e. removal of 3x well volume).
Decontamination procedure	Dedicated HydraSleeve® and HDPE hand bailers (single use and disposable) were used at each groundwater well thus removing the need for decontamination. All re-usable sampling equipment was thoroughly washed using PFAS & phosphate-free detergent, then double rinsed with clean water before the sample collection.
Sample identification, preservation transport and holding times	Each sample bottle was pre-labelled by the laboratory with a unique barcode. Samples were collected directly into appropriately preserved laboratory supplied bottles (Teflon-free) and packed in chilled containers for delivery to the laboratory under Chain of Custody (CoC) documentation. Sample containers, preservation procedures, sample storage requirements and holding times were undertaken in accordance with those recommended by Standards Australia (AS/NZS 5667.1:1998 and AS 4482.1 as appropriate). Where holding times did not comply, this is discussed in the data quality review in Appendix E.

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

3.2 Porewater and Sediment Sampling Methodology

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

Table 3-2 Sediment Sampling Methodology

Item	Details
Sample Collection	Sediment samples were collected at the sediment/water interface using hand tools (e.g. trowel, hand auger, PVC pipe etc.) with samples placed directly into appropriately labelled, laboratory supplied sample containers and packed in chilled containers for delivery to the laboratory under CoC documentation.
Field Parameters	At each sampling location, the sediment sample was visually assessed, and observations (including physical description) were recorded on field data sheets.
Decontamination	All re-usable sampling equipment was thoroughly washed using PFAS-free detergent, then double rinsed with clean water before the sample collection.
Quality Control	Sediment QC samples were collected at the following frequencies: ▪ Field duplicate (intra-laboratory) samples greater than 1 per 10 primary samples. ▪ Field triplicate (inter-laboratory) samples greater than 1 per 10 primary samples sent to a secondary laboratory.
Laboratory Testing	Sediment samples were submitted for the following analysis: ▪ Full PFAS analytical suite (refer to the SAQP for full list of analytes).

Table 3-3 Porewater Sampling Methodology

Item	Detail
Porewater Sample Collection	Porewater sampling was undertaken in accordance with the U.S. EPA guidance *Operating Procedure Pore Water Sampling*. Porewater was purged and sampled at less than 1 L per minute using a peristaltic pump, connected to a stainless steel tube with a screened section at its base (Drive-Point Piezometer). The porewater sampler was inserted to at least 1 m below the surficial marine sediments, to ensure collection of pore water rather than surface water. Tubing was replaced at each sampling location to prevent cross-contamination.
Field parameters	The following physicochemical parameters were recorded using a pre-calibrated water quality meter: ▪ pH ▪ EC ▪ ORP ▪ DO ▪ Temperature

Item	Detail
Decontamination	All re-usable sampling equipment was thoroughly washed using PFAS-free detergent, then double rinsed with clean water before the sample collection.
Sample identification, preservation, transport and holding times.	As detailed in Table 3-1.
Quality Control	Porewater QC samples were collected at the following frequencies: ▪ Field duplicate (intra-laboratory) samples at 1 per 10 water samples or 1 per batch if the batch was less than 10 samples. ▪ Field triplicate (inter-laboratory) samples at 1 per 10 water samples sent to a secondary laboratory.
Laboratory Testing	Porewater samples were submitted for the same analysis as groundwater samples (refer to Table 3-1).

3.3 Surface Water Sampling Methodology

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

Table 3-4 Surface water Sampling Methodology

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

3.4 Quality Control / Quality Assurance

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

> QA documentation.

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

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

3.5 Assessment Criteria

3.5.1 Groundwater, Porewater and Surface Water

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

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

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

Notes:

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

3.5.2 Sediment

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

4 Field Observations and Results

4.1 General Site Observations

The Q4 2023 monitoring event was completed between 11 and 19 December 2023. No significant weather event or site activity that could have impacted the reliability of the results obtained were noted during Q4 2023.

The daily maximum temperature during the monitoring event varied between 24 and 34°C.

4.2 Groundwater

4.2.1 Summary of Field Observations

4.2.1.1 Physicochemical parameters

Stabilised physicochemical parameters, water colour and turbidity observations recorded during the groundwater sampling event are presented in field sampling records, included in Table D1, Appendix D.

Field parameters were generally consistent with previous monitoring events. Groundwater pH ranged from 6.83 (MW141) to 8.00 (MW233) and was near neutral, and water was observed clear to cloudy/brown in colour. Groundwater temperature ranged from 19.7°C (MW259) to 26.3°C (MW269). DO readings ranged from 0.26 mg/L (MW199) to 7.72 mg/L (MW224) which indicates aerobic groundwater conditions. EC readings ranged from 468.8 µS/cm (MW242) to 43,759 µS/cm (MW125) and indicate fresh to highly saline groundwater conditions. There was a sulphur odour noted at MW199 and MW220.

4.2.1.2 Groundwater Elevation and Migration

Groundwater gauging data and reduced water levels (RWL) are provided within the field records in Table D1, Appendix D. The groundwater elevations ranged between -0.605 mAHD (MW228) and 0.738 mAHD (MW171) which is consistent with previous monitoring events. It is expected that groundwater levels and flow direction for monitoring well relatively close to the shoreline are locally and temporally influenced by tidal pressures.

Gauging data was used to infer the groundwater migration contours. Groundwater flow was interpreted to be radial from the site and towards areas of depression following local topography (i.e. groundwater generally flows towards the nearest coastline), which is consistent with previous monitoring events. Groundwater inferred elevation contours and inferred flow direction for the Q4 2023 monitoring event are shown in Figure 6, Appendix A.

4.2.2 Laboratory Results

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

Table 4-1 Summary of Groundwater Results Exceeding Adopted Criteria

Analytes	Locations Exceeding Criteria	Lowest Criteria (µg/L)	Max Conc. (µg/L)	No. Analytical Results[1]	No. Results Above Criteria
PFOA	MW112, MW123, MW141, MW236, MW258, MW282, MW500	0.56[2]	4.14 (MW282)	56	7
Sum of PFOS and PFHxS	MW109, MW112, MW120, MW121, MW123, MW125, MW141, MW142, MW166, MW171, MW173, MW193, MW215, MW216, MW217, MW220, MW228, MW233, MW236, MW240, MW243, MW249, MW255, MW256, MW257, MW258, MW259, MW268, MW269, MW282, MW288, MW289, MW496, MW500, MW516	0.07[2]	91.6 (MW282)	56	35

Analytes	Locations Exceeding Criteria	Lowest Criteria (µg/L)	Max Conc. (µg/L)	No. Analytical Results[1]	No. Results Above Criteria
PFOS	MW109, MW112, MW120, MW121, MW123, MW141, MW142, MW147, MW166, MW171, MW173, MW193, MW199, MW202, MW216, MW217, MW220, MW233, MW236, MW239, MW242, MW243, MW245, MW249, MW255, MW256, MW257, MW258, MW259, MW269, MW282, MW288, MW289, MW496, MW500, MW516	0.01[3]	62.8 (MW282)	56	37

Notes:

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

Findings are summarised as follows:

- No first-time detection of PFOA or Sum of PFOS and PFHxS above the LOR were reported for the groundwater monitoring locations in Q4 2023.
- A new exceedance of the Drinking Water criteria for PFOA (0.56 µg/L) was recorded at MW123 located at the FTA (1.61 µg/L recorded for the primary sample and 1.73 µg/L recorded for the intra-lab duplicate sample. The inter-lab duplicate sample did not record an exceedance of the criteria).

4.3 Surface Water

4.3.1 Summary of Field Observations

4.3.1.1 Physicochemical parameters

Stabilised physiochemical parameters, water colour and turbidity observations recorded during the surface water sampling program are presented in field sampling records, included in Table D3, Appendix D. Parameters were generally consistent with the previous monitoring events. Surface water pH ranged from 7.96 (SW371) to 8.40 (SW410) and was near neutral, temperature was 25.5°C on average, water was noted clear and EC readings ranging 52,031 µS/cm (SW372) to 59,200 µS/cm (SW410) indicate highly saline surface water conditions. DO readings ranging 3.23 mg/L (SW319) to 6.86 mg/L (SW410) indicate aerobic surface water conditions. No visual or olfactory evidence of contamination were recorded.

4.3.2 Laboratory Results

The results of laboratory analysis have been compared against adopted assessment criteria. A summary of results exceeding the adopted criteria is presented in Table 4-2. Laboratory results have also been compared to available historical data to identify monitoring locations where a first-time detection of Sum of PFOS and PFHxS or PFOA or a new exceedance of guideline values, were reported. Figures 3A and 3B in Appendix A presents the surface water monitoring locations. Tabulated results including non-PFAS analytes are presented in Table B1, Appendix B and the laboratory reports are provided in Appendix C.

Table 4-2 Summary of Surface water Results Exceeding Adopted Criteria

Analytes	Locations Exceeding Criteria	Lowest Criteria (µg/L)	Max Conc. (µg/L)	No. Analytical Results[1]	No. Results Above Criteria
PFOA	SW382	0.56[2]	0.06 (SW282)	28	0
Sum of PFOS and PFHxS	SW372, SW373, SW282	0.07[2]	2.54 (SW282)	28	3
PFOS	SW130, SW132, SW134, SW317*, SW371, SW372, SW373, SW282, SW406	0.01[3]	2.29 (SW282)	28	9

Notes:

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

*Duplicate result adopted.

Findings are summarised as follows:

- A first-time detection of Sum of PFOS and PFHxS above the LOR was recorded at SW410 located east of the HSF (0.02 µg/L recorded).
- A first-time detection of PFOA above the LOR was recorded at SW382 located west of the WWTP (0.06 µg/L recorded).
- SW382 also reported a new exceedance of the recreational use criteria for Sum of PFOS and PFHxS (criteria 2.0 µg/L, 2.54 µg/L recorded).

4.4 Porewater

4.4.1 Summary of Field Observations

4.4.1.1 Physicochemical parameters

Stabilised physiochemical parameters, water colour and turbidity observations recorded during the porewater sampling program are presented in field sampling records, included in Table D2, Appendix D. Parameters were generally consistent with the previous monitoring events. Porewater pH ranging 4.61 (PW369) to 8.07 (PW411) was acidic to near neutral, with an average temperature of 24.5°C. Water was generally clear/cloudy and EC readings ranging 7,042 µS/cm (PW346) to 65,173 µS/cm (PW306) indicate saline to highly saline porewater conditions. DO readings ranging 0.14 mg/L (PW368) to 5.34 mg/L (PW378) indicate anaerobic to aerobic porewater condition.

4.4.2 Laboratory Results

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

Table 4-3 Summary of Porewater Results Exceeding Adopted Criteria

Analytes	Locations Exceeding Criteria	Lowest Criteria (µg/L)	Max Conc. (µg/L)	No. Analytical Results[1]	No. Results Above Criteria
PFOA	-	0.56[2]	<0.01	39	0
Sum of PFOS and PFHxS	PW346, PW367*, PW368	0.07[2]	3.63 (PW346)	39	3
PFOS	PW306, PW335, PW340, PW341, PW345, PW346, PW352, PW362, PW363, PW364, PW367, PW368, PW369, PW378	0.01[3]	3.57 (PW346)	39	14

Notes:

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

*Inter-lab duplicate result adopted.

Findings are summarised as follows:

- PW306 located south of the HSF reported a first-time detection of Sum of PFOS and PFHxS above the LOR (0.05 µg/L recorded).
- PW306 also reported a new exceedance of the ecological assessment criteria for PFOS (0.00023 µg/L, LOR adopted – 0.05 µg/L recorded).

4.5 Sediment

4.5.1 Summary of Field Observations

Observations recorded during the sediment sampling program are provided in the field sampling records within Appendix D. Sediment samples were generally described as beige, fine to medium grained, wet sand.

4.5.2 Laboratory Results

The results of laboratory analysis have been compared to available historical data. Figures 5A and 5B in Appendix A presents the sediment monitoring locations. Tabulated results are presented in Appendix B and the laboratory reports are provided in Appendix C.

Findings are summarised as follows:

- No first-time detection of PFOS or Sum of PFOS and PFHxS was reported for the sediment monitoring locations in Q4 2023.

4.6 Changes to the Monitoring Network Condition

The following change to the OMP monitoring network were noted during Q4 2023:

- Monitoring well MW199 was able to be sampled (previously found having a bended PVC casing bgl).

5 Summary and Conclusions

Cardno undertook the Q4 2023 groundwater, porewater, surface water and sediment monitoring event at HMAS Stirling as part of the PFAS OMP. Sampling and testing was undertaken at 56 monitoring wells, 28 surface water locations and 39 co-located sediment and porewater sampling locations.

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

The groundwater laboratory results reported the following:

- Of the 56 samples that were tested, PFOA (7 samples), PFOS (37 samples) and Sum of PFOS and PFHxS (35 samples) reported concentrations that exceeded adopted assessment criteria.
- No first-time detection of PFOA or Sum of PFOS and PFHxS above the LOR were reported for the groundwater monitoring locations in Q4 2023.
- A new exceedance of the Drinking Water criteria for PFOA was recorded at MW123 located at the FTA.

The surface water laboratory results reported the following:

- Of the 28 samples tested, PFOS (9 samples) and Sum of PFOS and PFHxS (3 samples) were reported above the adopted assessment criteria.
- A first-time detection of Sum of PFOS and PFHxS above the LOR was recorded at SW410 located east of the HSF.
- A first-time detection of PFOA above the LOR was recorded at SW382 located west of the WWTP.
- SW382 also reported a new exceedance of the recreational use criteria for the Sum of PFOS and PFHxS.

The porewater laboratory results reported the following:

- Of the 39 samples that were tested, PFOS (14 samples) and Sum of PFOS and PFHxS (3 samples) reported concentrations above adopted assessment criteria.
- PW306 located south of the HSF reported a first-time detection of Sum of PFOS and PFHxS above the LOR.
- PW306 also reported a new exceedance of the ecological assessment criteria for PFOS.

The sediment laboratory results reported the following:

- No first-time detection was reported for the sediment monitoring locations in Q4 2023.

The following actions should be considered prior to the next OMP sampling event:

- Replacement of the groundwater monitoring wells lost/damaged at the demolition ground (MW137, MW272) and main base area (MW517, MW264, MW518, MW010, MW261).

The next OMP sampling event for HMAS Stirling will be the quarterly monitoring event (Q1 2024), scheduled for March 2024. An Ongoing Monitoring Report will be prepared for the October 2022 – September 2023 monitoring period.

6 References

General References

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3. *Contaminated Sites Act 2003*, Western Australia.
4. Department of Defence, 2021, *Defence Contamination Management Manual* (DCMM) *Annex L Data Management*.
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6. Department of Water and Environmental Regulation (DWER), 2021, *Assessment and Management of Contaminated Sites*.
7. Department of Water and Environment Regulation (DWER), 2018, Perth Groundwater Atlas, (https://maps.water.wa.gov.au/#/webmap/gwm).
8. Environmental Protection Agency (United States EPA), November 2002, Reference: EPA/240/R-02/004, *Guidance on Environmental Data Verification and Data Validation.*
9. The Heads of EPAs Australia and New Zealand (HEPA; 2020) *PFAS National Environmental Management Plan (NEMP) 2.0*, January 2020.
10. National Environment Protection Council (NEPC), 1999, *National Environmental Protection (Assessment of Site Contamination) Measure* (as amended), registered May 2013.
11. National Health and Medical Research Council (NHMRC) (2011 – updated 2022) *National Water Quality Management Strategy Australian Drinking Water Guidelines 6*, September 2022.
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Site Specific References

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17. Cardno, December 2023, *PFAS Ongoing Monitoring Plan Sampling and Analysis Quality Plan (SAQP) HMAS Stirling*. Rev 12.
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20. Cardno, 23 September 2020, *PFAS OMP 2020 Q2 Quarterly Sampling Event Factual Report*, HMAS Stirling.
21. Cardno, 22 January 2021, *PFAS OMP 2020 Q3 Quarterly Sampling Event Factual Report*, HMAS Stirling.
22. Cardno, March 2021, *PFAS OMP 2020 Q4 Quarterly Sampling Event Factual Report*, HMAS Stirling.
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25. Cardno, September 2021, *PFAS OMP – 2020 Annual Interpretive Report*, HMAS Stirling.
26. Cardno, November 2021, *PFAS OMP 2021 Q3 Quarterly Sampling Event Factual Report*, HMAS Stirling.
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35. RPS, May 2018, *Detailed Site Investigation – HMAS Stirling PFAS Investigation*, Ref. EEC16094.003 (RPS, 2018b).

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APPENDIX

A

FIGURES

Cardno

now

Stantec

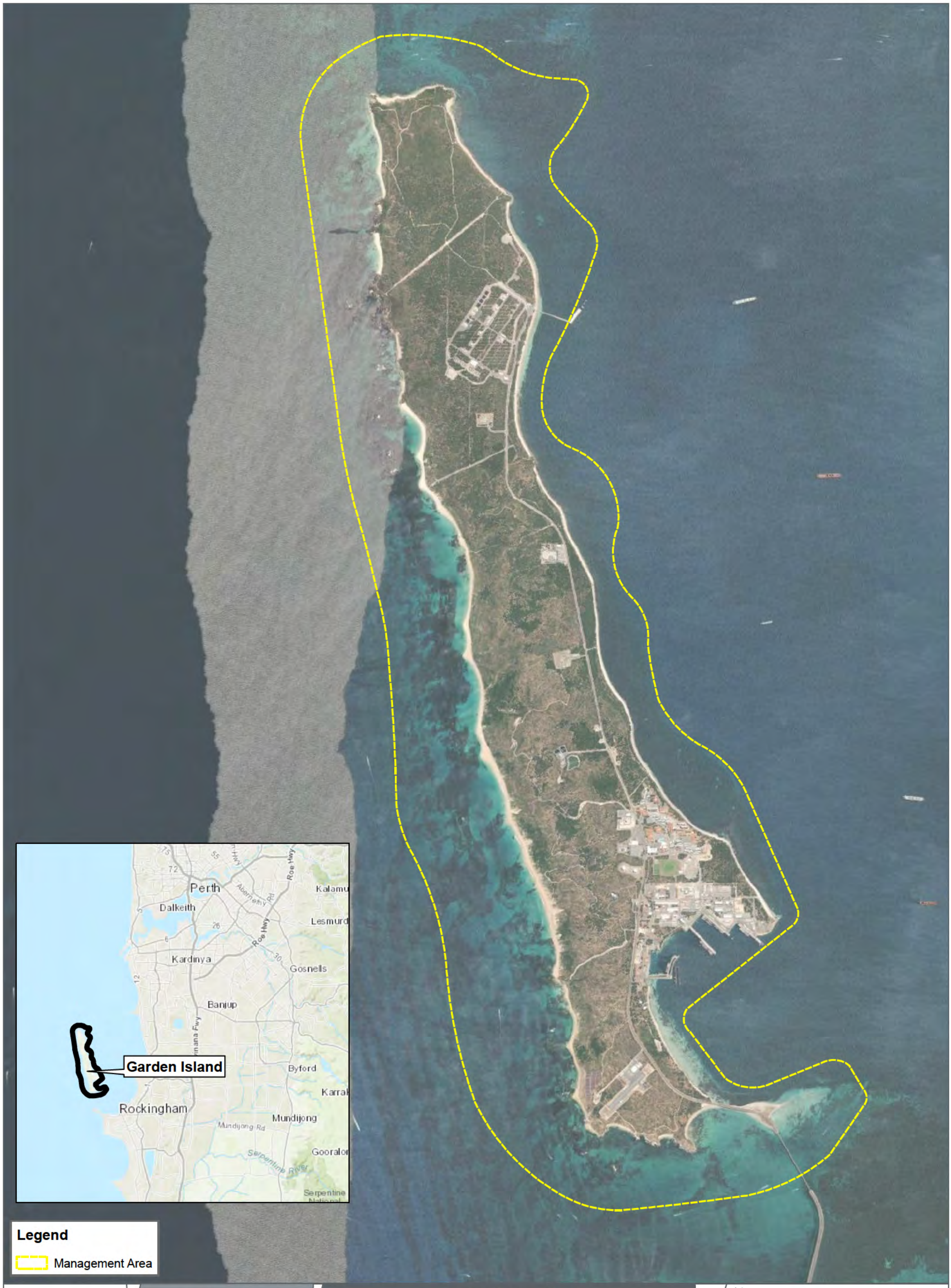

FIGURE 1A

1:32,000 Scale at A3

Metres

0 500 1,000

Site Location

Q4 2023 QUARTERLY SAMPLING EVENT
HMAS STIRLING
DEPARTMENT OF DEFENCE

N

Cardno

Map Produced by Cardno WA
Date: 2024-01-10 | Project: DEF19009
Coordinate System: GDA 1994 MGA Zone 50
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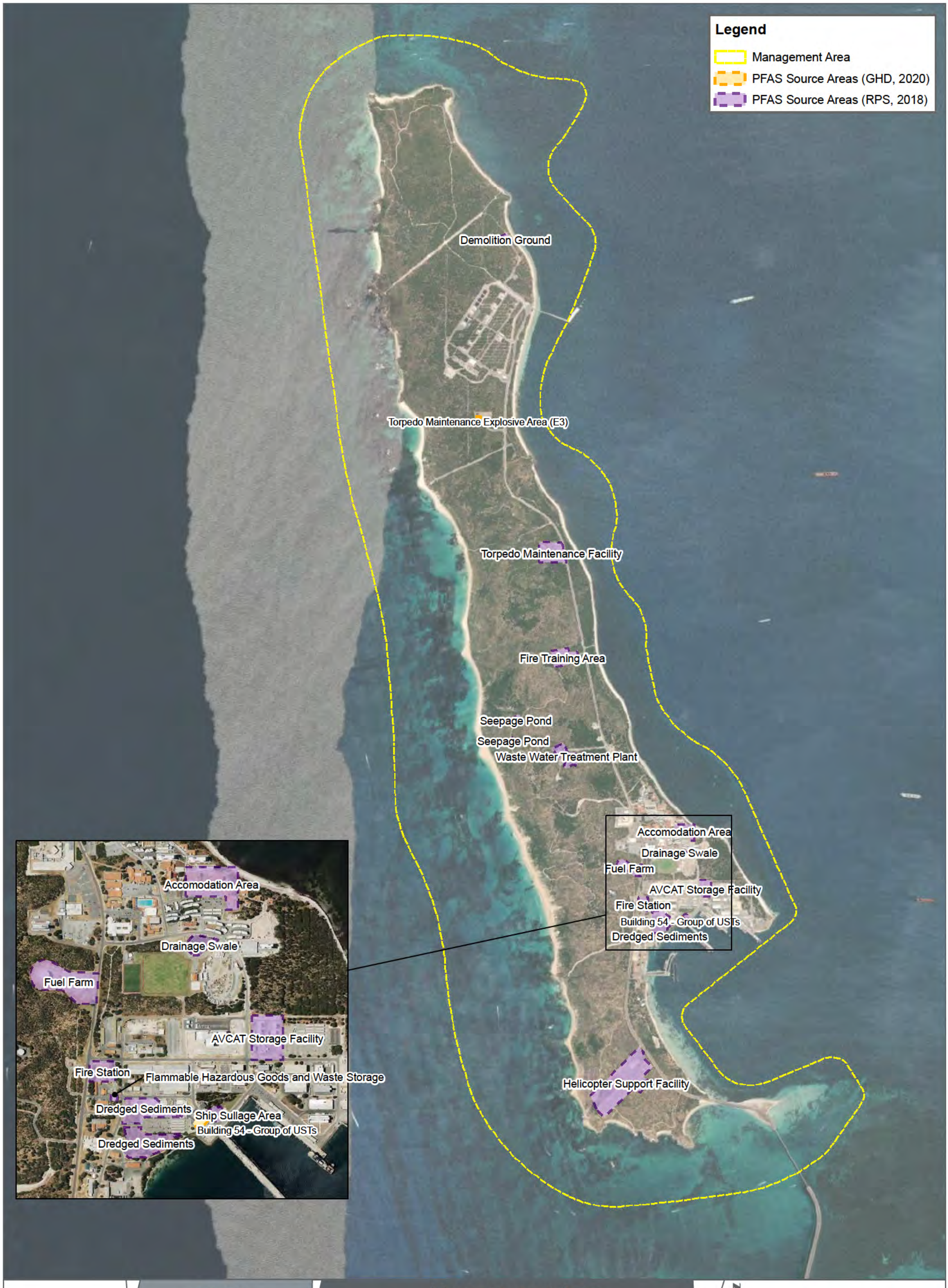

FIGURE 1B

1:32,000 Scale at A3

Metres

0 500 1,000

Management Area

Q4 2023 QUARTERLY SAMPLING EVENT
HMAS STIRLING
DEPARTMENT OF DEFENCE

Cardno

Map Produced by Cardno WA
Date: 2024-01-10 | Project: DEF19009
Coordinate System: GDA 1994 MGA Zone 50
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Aerial Imagery Supplied by Google Earth & Metromap

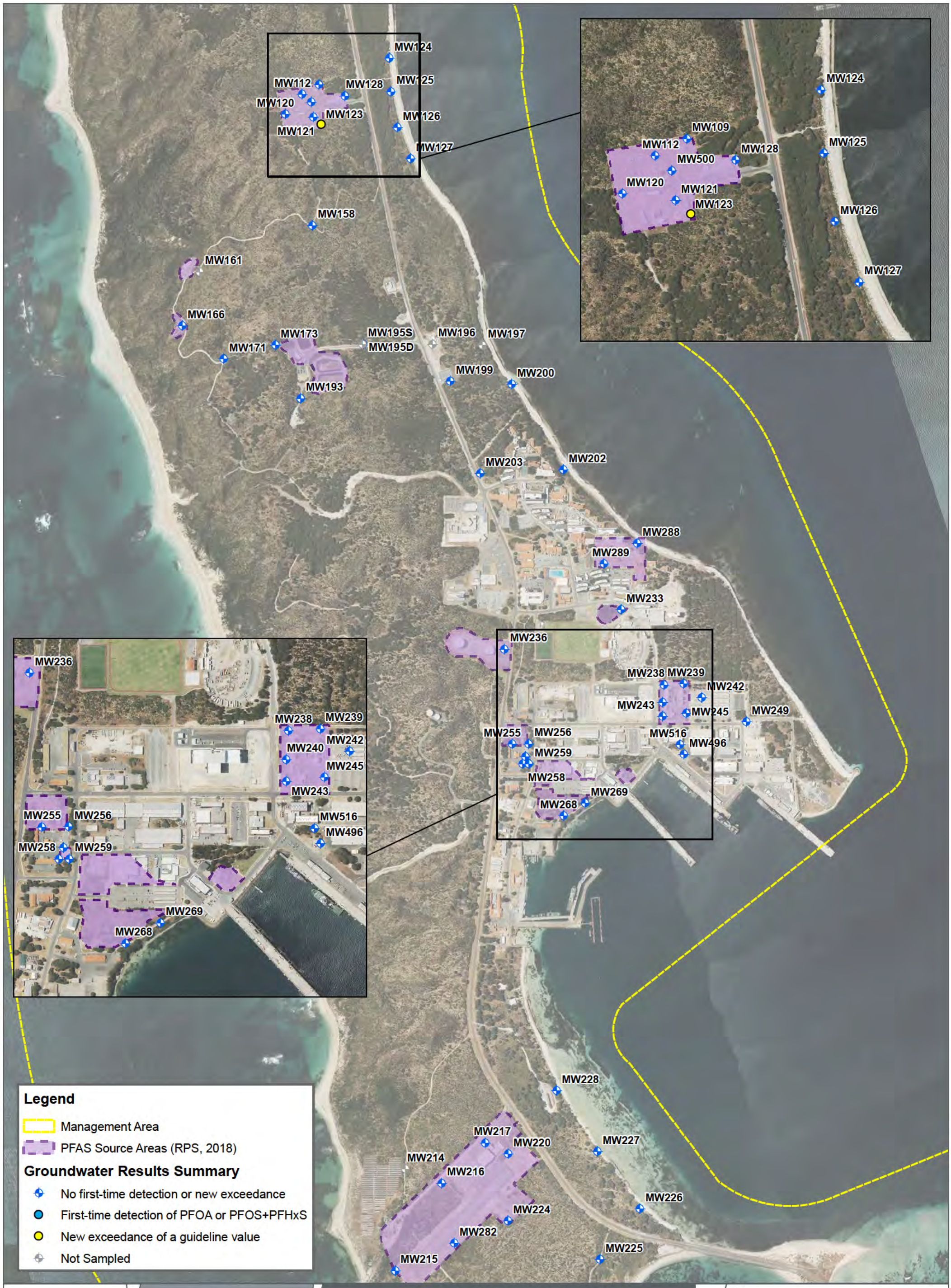
MW124
MW112
MW128
MW125
MW120
MW123
MW126
MW121
MW127
MW158
MW161
MW166
MW173
MW195S
MW196
MW197
MW171
MW195D
MW199
MW200
MW193
MW203
MW202
MW288
MW289
MW233
MW236
MW238
MW239
MW242
MW240
MW243
MW245
MW255
MW256
MW516
MW496
MW259
MW258
MW269
MW268
MW228
MW217
MW220
MW227
MW214
MW216
MW226
MW224
MW282
MW225
MW215
MW109
MW500
Legend
Management Area
PFAS Source Areas (RPS, 2018)
Groundwater Results Summary
No first-time detection or new exceedance
First-time detection of PFOA or PFOS+PFHxS
New exceedance of a guideline value
Not Sampled
FIGURE 2A
1:12,500 Scale at A3
Metres
0
300
600
Groundwater Results
Q4 2023 QUARTERLY SAMPLING EVENT
HMAS STIRLING
DEPARTMENT OF DEFENCE
N
Cardno
Map Produced by Cardno WA
Date: 2024-01-10 | Project: DEF19009
Coordinate System: GDA 1994 MGA Zone 50
Map: DEF19009_WA_0089-GS-002A_2023Q3_GWResultSummary_PFAS 01.mxd
Aerial Imagery Supplied by Aerometrex



FIGURE 2B

1:15,000 Scale at A3

Metres

0 250 500

Groundwater Results

Q4 2023 QUARTERLY SAMPLING EVENT
HMAS STIRLING
DEPARTMENT OF DEFENCE

N

Cardno

Map Produced by Cardno WA
Date: 2024-01-10 | Project: DEF19009
Coordinate System: GDA 1994 MGA Zone 50
Map: DEF19009_WA_0089-GS-002B_2023Q4_GWResultSummary_PFAS 01.mxd
Aerial Imagery Supplied by Aerometrex

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

Legend

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

Surface water Results Summary

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

FIGURE 3A

1:15,000 Scale at A3

Metres

0 300 600

Surface water Results

Q4 2023 QUARTERLY SAMPLING EVENT
HMAS STIRLING
DEPARTMENT OF DEFENCE

N

Cardno

Map Produced by Cardno WA
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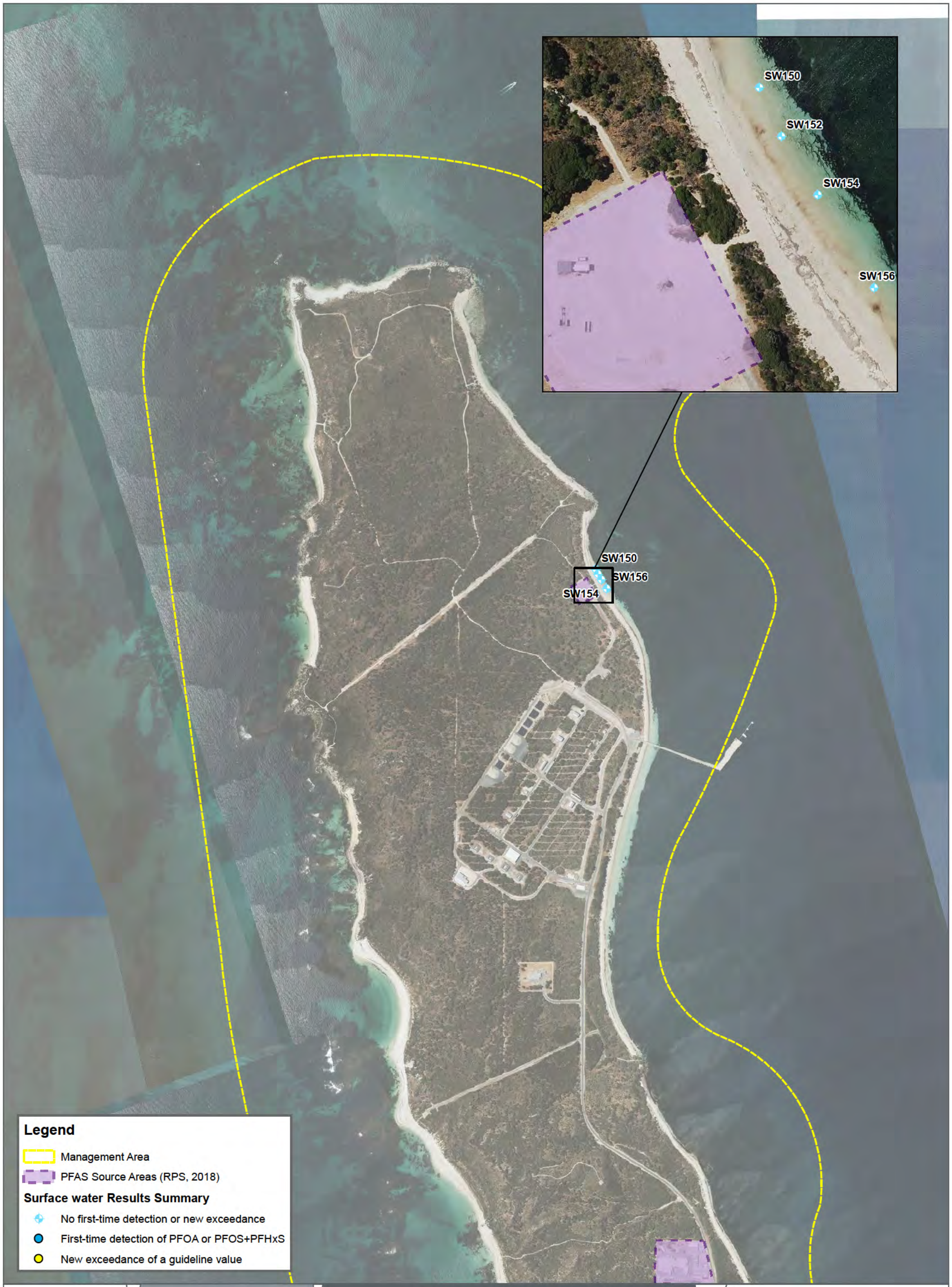
SW150
SW152
SW154
SW156
SW150
SW156
SW154
Legend
Management Area
PFAS Source Areas (RPS, 2018)
Surface water Results Summary
No first-time detection or new exceedance
First-time detection of PFOA or PFOS+PFHxS
New exceedance of a guideline value
FIGURE 3B
1:15,000 Scale at A3
Metres
0
300
600
Surface water Results
Q4 2023 QUARTERLY SAMPLING EVENT
HMAS STIRLING
DEPARTMENT OF DEFENCE
N
Cardno
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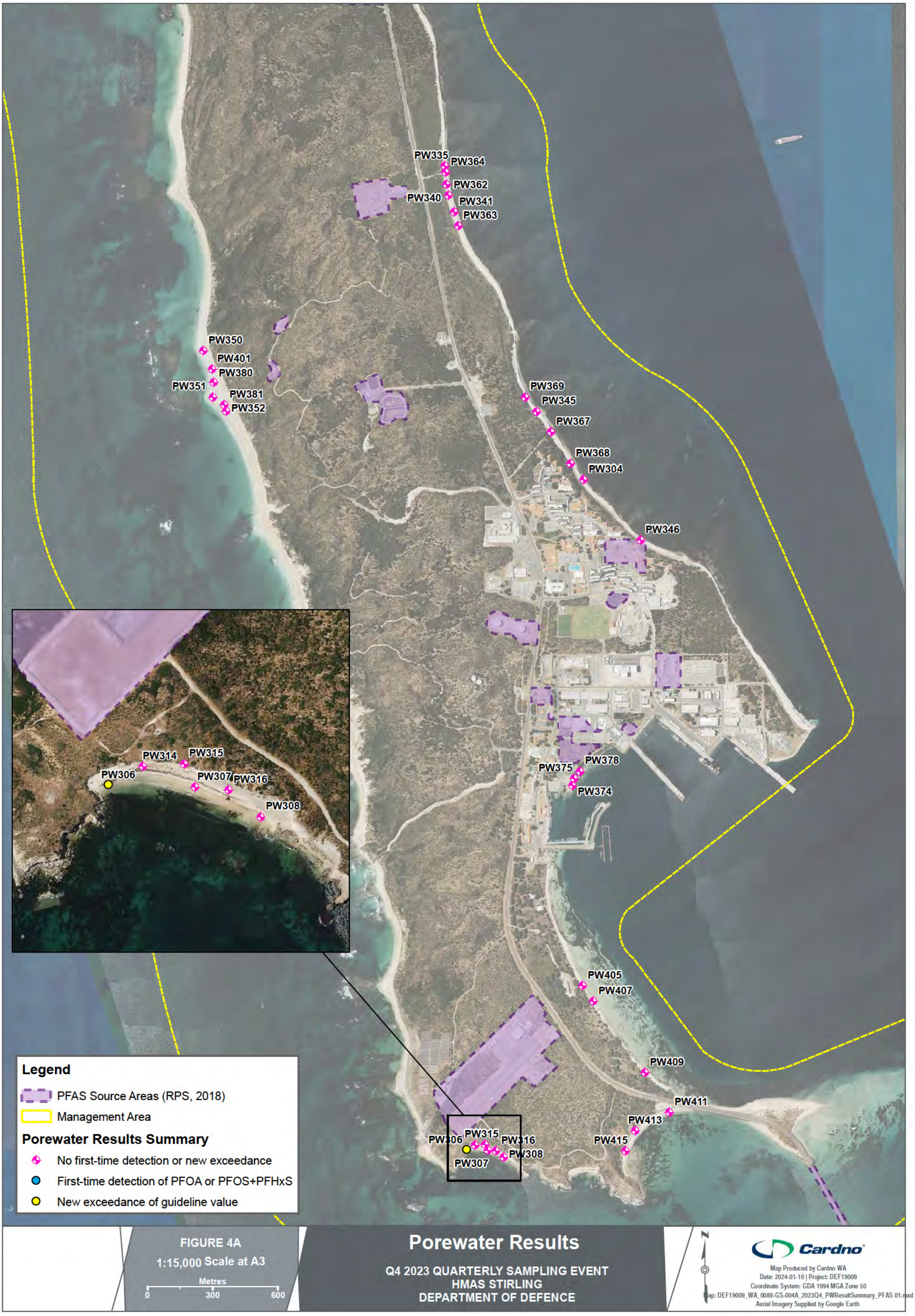
PW335
PW364
PW362
PW340
PW341
PW363
PW350
PW401
PW380
PW351
PW381
PW352
PW369
PW345
PW367
PW368
PW304
PW346
PW314
PW315
PW306
PW307
PW316
PW308
PW375
PW378
PW374
PW405
PW407
PW409
PW411
PW413
PW415
Legend
PFAS Source Areas (RPS, 2018)
Management Area
Porewater Results Summary
No first-time detection or new exceedance
First-time detection of PFOA or PFOS+PFHxS
New exceedance of guideline value
FIGURE 4A
1:15,000 Scale at A3
Metres
0
300
600
Porewater Results
Q4 2023 QUARTERLY SAMPLING EVENT
HMAS STIRLING
DEPARTMENT OF DEFENCE
N
Cardno
Map Produced by Cardno WA
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Aerial Imagery Supplied by Google Earth


PW356
PW331
PW357
PW330
PW358
PW329
PW356
PW358
PW357
PW329
Legend
Management Area
PFAS Source Areas (RPS, 2018)
Porewater Results Summary
No first-time detection or new exceedance
First-time detection of PFOA or PFOS+PFHxS
New exceedance of guideline value
FIGURE 4B
1:15,000 Scale at A3
Metres
0
300
600
Porewater Results
Q4 2023 QUARTERLY SAMPLING EVENT
HMAS STIRLING
DEPARTMENT OF DEFENCE
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Cardno
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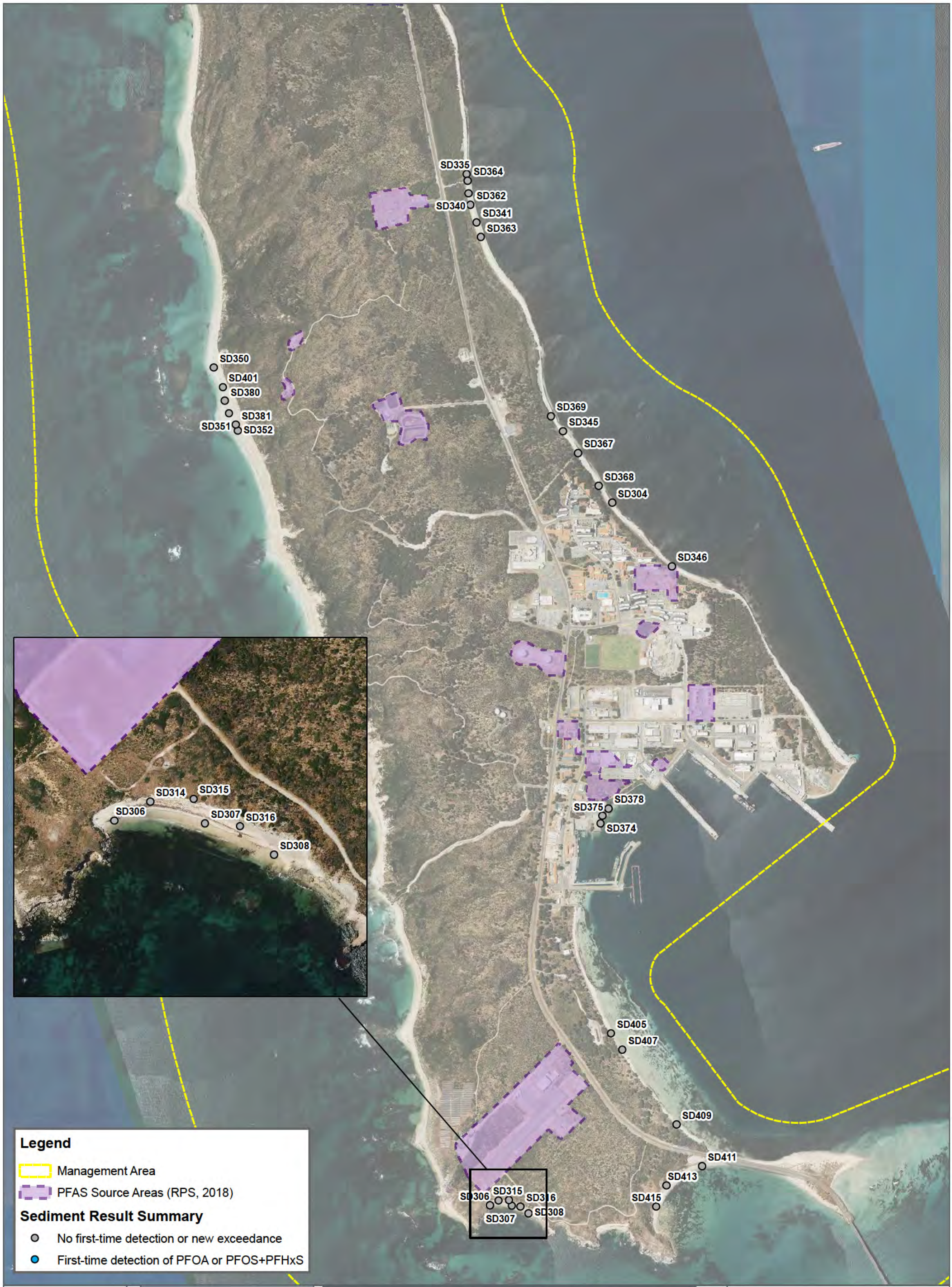
SD335
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SD307
SD316
SD308
SD378
SD375
SD374
SD405
SD407
SD409
SD411
SD413
SD415
SD306
SD315
SD316
SD308
SD307
Legend
Management Area
PFAS Source Areas (RPS, 2018)
Sediment Result Summary
No first-time detection or new exceedance
First-time detection of PFOA or PFOS+PFHxS
FIGURE 5A
1:15,000 Scale at A3
Metres
0
300
600
Sediment Results
Q4 2023 QUARTERLY SAMPLING EVENT
HMAS STIRLING
DEPARTMENT OF DEFENCE
N
Cardno
Map Produced by Cardno WA
Date: 2024-01-10 | Project: DEF19009
Coordinate System: GDA 1994 MGA Zone 50
Map: DEF19009_WA_0089-GS-005A_2023Q4_SDResultSummary_PFAS 01.mxd
Aerial Imagery Supplied by Google Earth



FIGURE 5B

1:15,000 Scale at A3

Metres

0 300 600

Sediment Results

Q4 2023 QUARTERLY SAMPLING EVENT
HMAS STIRLING
DEPARTMENT OF DEFENCE

N

Cardno

Map Produced by Cardno WA
Date: 2024-01-10 | Project: DEF19009
Coordinate System: GDA 1994 MGA Zone 50
Map: DEF19009_WA_0089-GS-005B_2023Q4_SDResultSummary_PFAS 01.mxd
Aerial Imagery Supplied by Google Earth & NearMap



Legend

- Monitoring well (RWL, mAHD)
- Contours (mAHD)
- Management Area

Note: Gauging was generally conducted during outgoing tides to minimise potential tidal pressure influence

FIGURE 6

1:32,000 Scale at A3

Metres 0 500 1,000

Inferred Groundwater Contours

Q4 2023 QUARTERLY SAMPLING EVENT
HMAS STIRLING
DEPARTMENT OF DEFENCE

Cardno

Map Produced by Cardno WA
Date: 2024-01-11 | Project: DEF19009
Coordinate System: GDA 1994 MGA Zone 50
Map: DEF19009_WA_0089-GS-006_2023Q4_GroundwaterContours 02.mxd
Aerial Imagery Supplied by Google Earth & NearMap

APPENDIX

B

DATA ASSESSMENT TABLES

Cardno

now

Stantec

						PFAS - Perfluoroalkyl Sulfonic Acids						PFAS - Perfluoroalkyl Carboxylic Acids										
						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)
						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 - Limit of Reporting						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
PFAS NEMP 2020 Drinking Water																*0.56*						
PFAS NEMP 2020 Freshwater 99%										0.00023*						19						
PFAS NEMP 2020 Recreational Water																10						
Monitoring Area	**Location Code**	**Date**	**Field ID**	**Sample Type**	**Lab Report Number**																	
FTA	MW109	12/12/2023	0089_MW109_231212	Normal	EP2317628	0.05	0.11	0.38	<0.01	0.12	<0.01	<0.05	<0.01	0.06	<0.01	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
FTA	MW112	12/12/2023	0089_MW112_231212	Normal	EP2317628	0.04	0.11	4.53	0.40	27.1	<0.01	<0.05	0.08	0.32	0.16	*1.31*	0.04	<0.01	<0.01	<0.01	<0.01	<0.01
FTA	MW112	12/12/2023	0089_QC113_231212	Field Duplicate	EP2317628	0.05	0.12	4.51	0.40	27.3	<0.01	<0.05	0.08	0.32	0.17	*1.23*	0.04	<0.01	<0.01	<0.01	<0.01	<0.01
FTA	MW112	12/12/2023	0089_QC213_231212	Interlab Duplicate	1053798	0.04	0.06	2.9	0.30	16	<0.01	<0.05	0.08	0.31	0.14	*0.88*	0.03	<0.01	<0.01	<0.01	<0.01	<0.01
FTA	MW120	12/12/2023	0089_MW120_231212	Normal	EP2317628	0.02	0.04	1.62	0.23	0.46	<0.01	<0.05	<0.01	0.06	<0.01	0.10	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
FTA	MW120	12/12/2023	0089_QC112_231212	Field Duplicate	EP2317628	<0.01	0.04	1.53	0.22	0.48	<0.01	<0.05	<0.01	0.06	<0.01	0.08	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
FTA	MW120	12/12/2023	0089_QC212_231212	Interlab Duplicate	1053798	0.01	0.06	1.5	0.20	0.51	<0.01	<0.05	<0.01	0.04	<0.01	0.09	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
FTA	MW121	12/12/2023	0089_MW121_231212	Normal	EP2317628	<0.01	<0.01	0.08	<0.01	0.12	<0.01	<0.05	<0.01	<0.01	<0.01	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
FTA	MW123	12/12/2023	0089_MW123_231212	Normal	EP2317628	0.50	1.63	19.0	0.91	36.9	<0.01	0.1	0.27	1.91	0.26	*1.61*	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
FTA	MW123	12/12/2023	0089_QC108_231212	Field Duplicate	EP2317628	0.53	1.75	18.3	1.05	40.0	<0.01	0.1	0.29	1.94	0.27	*1.73*	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
FTA	MW123	12/12/2023	0089_QC208_231212	Interlab Duplicate	1053798	0.47	1.3	17	0.94	30	<0.01	0.10	0.22	2.3	0.24	0.42	0.01	<0.01	<0.01	<0.01	<0.01	<0.01
FTA	MW124	11/12/2023	0089_MW124_231211	Normal	EP2317575	<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
FTA	MW125	11/12/2023	0089_MW125_231211	Normal	EP2317575	0.10	0.11	0.33	<0.01	<0.01	<0.01	<0.05	<0.01	0.11	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
FTA	MW126	11/12/2023	0089_MW126_231211	Normal	EP2317575	<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
FTA	MW127	11/12/2023	0089_MW127_231211	Normal	EP2317575	<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
FTA	MW128	12/12/2023	0089_MW128_231212	Normal	EP2317628	<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
Demolition Ground	MW139	19/12/2023	0089_MW139_231219	Normal	EP2318017	<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
Demolition Ground	MW141	19/12/2023	0089_MW141_231219	Normal	EP2318017	0.53	0.89	16.6	0.80	49.5	<0.01	0.3	1.13	14.9	0.39	*1.06*	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Demolition Ground	MW142	19/12/2023	0089_MW142_231219	Normal	EP2318017	0.15	0.22	4.33	0.14	4.39	<0.01	<0.05	0.26	2.82	0.08	0.30	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Demolition Ground	MW147	19/12/2023	0089_MW147_231219	Normal	EP2318017	<0.01	<0.01	0.02	<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
Demolition Ground	MW149	19/12/2023	0089_MW149_231219	Normal	EP2318017	<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
WWTP	MW158	12/12/2023	0089_MW158_231212	Normal	EP2317628	<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
WWTP	MW166	12/12/2023	0089_MW166_231212	Normal	EP2317628	0.03	0.06	0.20	0.03	3.30	<0.01	<0.05	<0.01	0.03	<0.01	0.02	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
WWTP	MW171	12/12/2023	0089_MW171_231212	Normal	EP2317628	0.39	0.29	1.18	0.04	0.03	<0.01	0.2	0.14	0.63	0.04	0.03	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
WWTP	MW173	13/12/2023	0089_MW173_231213	Normal	EP2317729	0.11	0.08	1.35	0.25	2.40	<0.01	<0.05	0.05	0.19	0.03	0.16	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
WWTP	MW193	13/12/2023	0089_MW193_231213	Normal	EP2317729	0.39	0.64	5.19	0.32	1.49	<0.01	0.1	0.16	0.91	0.11	0.35	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
WWTP	MW195D	13/12/2023	0089_MW195D_231213	Normal	EP2317729	<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
WWTP	MW199	12/12/2023	0089_MW199_231212	Normal	EP2317628	<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
WWTP	MW200	13/12/2023	0089_MW200_231213	Normal	EP2317729	<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
WWTP	MW202	13/12/2023	0089_MW202_231213	Normal	EP2317700	<0.01	<0.01	0.02	<0.01	0.04	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
WWTP	MW202	13/12/2023	0089_QC117_231213	Field Duplicate	EP2317700	<0.01	<0.01	0.02	<0.01	0.04	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
WWTP	MW202	13/12/2023	0089_QC217_231213	Interlab Duplicate	1053798	<0.01	<0.01	0.01	<0.01	0.04	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
WWTP	MW203	12/12/2023	0089_MW203_231212	Normal	EP2317628	<0.01	0.03	0.07	<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
HSF	MW215	11/12/2023	0089_MW215_231211	Normal	EP2317555	0.04	0.07	0.58	<0.01	<0.01	<0.01	<0.05	0.03	0.10	0.02	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
HSF	MW216	11/12/2023	0089_MW216_231211	Normal	EP2317575	0.14	0.14	1.33	0.04	0.30	<0.01	3.3	8.97	7.67	1.31	0.14	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
HSF	MW217	13/12/2023	0089_MW217_231213	Normal	EP2317849	<0.01	<0.01	0.04	<0.01	0.29	<0.01	1.5	5.70	5.91	0.86	0.34	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
HSF	MW217	13/12/2023	0089_QC118_231213	Field Duplicate	EP2317849	<0.01	<0.01	0.09	<0.01	0.40	<0.01	1.4	5.22	5.92	0.89	0.34	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
HSF	MW217	13/12/2023	0089_QC218_231213	Interlab Duplicate	1053798	<0.01	0.02	0.04	<0.01	0.13	<0.01	1.5	5.5	4.8	0.74	0.29	0.01	<0.01	<0.01	<0.01	<0.01	<0.01
HSF	MW220	13/12/2023	0089_MW220_231213	Normal	EP2317849	0.04	0.03	0.29	0.05	4.31	<0.01	<0.05	0.08	0.11	0.04	0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
HSF	MW224	13/12/2023	0089_MW224_231213	Normal	EP2317849	<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
HSF	MW225	11/12/2023	0089_MW225_231211	Normal	EP2317555	<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
HSF	MW226	11/12/2023	0089_MW226_231211	Normal	EP2317575	<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
HSF	MW227	11/12/2023	0089_MW227_231211	Normal	EP2317555	<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
HSF	MW228	11/12/2023	0089_MW228_231211	Normal	EP2317555	0.25	0.21	0.49	<0.01	<0.01	<0.01	1.2	4.23	5.03	1.07	0.32	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
HSF	MW228	11/12/2023	0089_QC102_231211	Field Duplicate	EP2317555	0.28	0.21	0.56	<0.01	<0.01	<0.01	1.1	3.56	4.67	1.19	0.29	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
HSF	MW228	11/12/2023	0089_QC202_231211	Interlab Duplicate	1053798	0.29	0.35	0.75	<0.01	<0.01	<0.01	1.4	4.7	4.8	1.3	0.40	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
AVCAT Storage and Fuel Farm	MW233	13/12/2023	0089_MW233_231213	Normal	EP2317700	<0.01	<0.01	0.05	<0.01	0.12	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
AVCAT Storage and Fuel Farm	MW236	13/12/2023	0089_MW236_231213	Normal	EP2317849	0.28	0.46	11.8	0.47	57.5	<0.01	<0.05	0.10	0.76	0.20	*1.29*	2.38	<0.01	<0.01	<0.01	<0.01	<0.01
AVCAT Storage and Fuel Farm	MW238	12/12/2023	0089_MW238_231212	Normal	EP2317627	<0.01	<0.01	0.02	<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
AVCAT Storage and Fuel Farm	MW239	12/12/2023	0089_MW239_231212	Normal	EP2317627	<0.01	<0.01	<0.01	<0.01	0.02	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
AVCAT Storage and Fuel Farm	MW240	12/12/2023	0089_MW240_231212	Normal	EP2317627	<0.01	0.04	3.84	0.04	<0.01	<0.01	<0.05	<0.01	0.10	0.03	0.11	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
AVCAT Storage and Fuel Farm	MW242	13/12/2023	0089_MW242_231213	Normal	EP2317700	<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
AVCAT Storage and Fuel Farm	MW243	12/12/2023	0089_MW243_231212	Normal	EP2317627	<0.01	<0.01	0.08	<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
AVCAT Storage and Fuel Farm	MW245	12/12/2023	0089_MW245_231212	Normal	EP2317627	<0.01	<0.01	<0.01	<0.01	0.02	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
AVCAT Storage and Fuel Farm	MW249	12/12/2023	0089_MW249_231212	Normal	EP2317627	<0.01	<0.01	0.21	<0.01	0.08	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
	MW255	13/12/2023	0089_MW255_231213	Normal	EP2317700	0.44	0.48	3.00	<0.01	0.30	<0.01	0.1	0.16	0.78	0.08	0.02	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
	MW256	13/12/2023	0089_MW256_231213	Normal	EP2317700	2.62	3.15	8.24	0.28	3.82	<0.01	0.7	0.90	5.50	0.38	0.34	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
	MW257	13/12/2023	0089_MW257_231213	Normal	EP2317700	<0.01	<0.01	0.16	<0.01	0.05	<0.01	<0.05	0.20	0.13	<0.01	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
	MW258	13/12/2023	0089_MW258_231213	Normal	EP2317700	4.99	5.51	13.6	0.67	6.03	<0.01	1.3	1.78	7.04	0.72	*0.62*	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Fire Station,	MW259	13/12/2023	0089_MW259_231213	Normal	EP2317700	<0.01	<0.01	0.05	<0.01	0.06	<0.01	<0.05	0.06	0.04	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Flammable/Hazardous Goods	MW259	13/12/2023	0089_QC114_231213	Field Duplicate	EP2317700	<0.01	<0.01	0.05	<0.01	0.06	<0.01	<0.05	0.06	0.04	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
and Waste Storage, Ship Sullage	MW259	13/12/2023	0089_QC214_231213	Interlab Duplicate	1053798	<0.01	<0.01	0.05	<0.01	0.07	<0.01	<0.05	0.07	0.04	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Dredge Spoil / Careening Bay	MW268	12/12/2023	0089_MW268_231212	Normal	EP2317627	0.04	0.07	0.33	<0.01	<0.01	<0.01	<0.05	<0.01	0.03	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Dredge Spoil / Careening Bay	MW269	12/12/2023	0089_MW269_231212	Normal	EP2317627	0.06	0.09	0.31	<0.01	0.38	<0.01	<0.05	0.02	0.14	<0.01	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
HSF	MW282	13/12/2023	0089_MW282_231213	Normal	EP2317849	1.29	5.68	28.8	4.98	62.8	<0.01	0.6	0.75	6.23	1.98	*4.14*	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Accomodation Area	MW288	13/12/2023	0089_MW288_231213	Normal	EP2317700	<0.01	<0.01	<0.01	<0.01	0.33	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Accomodation Area	MW289	11/12/2023	0089_MW289_231211	Normal	EP2317575	0.03	0.04	0.41	0.03	1.37	<0.01	<0.05	<0.01	0.05	<0.01	0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
AVCAT Storage and Fuel Farm	MW496	12/12/2023	0089_MW496_231212	Normal	EP2317627	0.04	0.07	0.79	0.07	7.04	<0.01	<0.05	<0.01	0.11	<0.01	0.07	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
FTA	MW500	12/12/2023	0089_MW500_231212	Normal	EP2317628	1.68	1.40	22.4	3.69	56.8	<0.01	0.8	0.99	4.46	0.44	*1.40*	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
AVCAT Storage and Fuel Farm	MW516	12/12/2023	0089_MW516_231212	Normal	EP2317627	0.02	0.03	0.32	0.03	4.21	<0.01	<0.05	<0.01	0.02	<0.01	0.02	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
WWTP (East)	PW304	13/12/2023	0089_PW304_231213	Normal	EP2317701	<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
HSF	PW306	11/12/2023	0089_PW306_231211	Normal	EP2317576	<0.01	<0.01	<0.01	<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
HSF	PW307	11/12/2023	0089_PW307_231211	Normal	EP2317576	<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

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B1 - Water samples analytical results

PFAS OMP
HMAS Stirling
Q4 2023

							PFAS - Perfluoroalkyl Sulfonic Acids						PFAS - Perfluoroalkyl Carboxylic Acids										
							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)
							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 - Limit of Reporting							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
PFAS NEMP 2020 Drinking Water																	*0.56*						
PFAS NEMP 2020 Freshwater 99%											0.00023*						19						
PFAS NEMP 2020 Recreational Water																	10						
Monitoring Area	**Location Code**	**Date**	**Field ID**	**Sample Type**	**Lab Report Number**																		
HSF	PW308	11/12/2023	0089_PW308_231211	Normal	EP2317576		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.1	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
HSF	PW314	11/12/2023	0089_PW314_231211	Normal	EP2317576		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.1	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
HSF	PW315	11/12/2023	0089_PW315_231211	Normal	EP2317576		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.1	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
HSF	PW316	11/12/2023	0089_PW316_231211	Normal	EP2317576		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.1	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Demolition Ground	PW329	19/12/2023	0089_PW329_231219	Normal	EP2318014		<0.01	0.01	<0.01	<0.01	0.01	<0.01	<0.1	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Demolition Ground	PW330	19/12/2023	0089_PW330_231219	Normal	EP2318014		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.1	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Demolition Ground	PW331	19/12/2023	0089_PW331_231219	Normal	EP2318014		<0.01	0.01	<0.01	<0.01	<0.01	<0.01	<0.1	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
FTA	PW335	11/12/2023	0089_PW335_231211	Normal	EP2317576		<0.01	<0.01	<0.01	<0.01	0.01	<0.01	<0.1	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
FTA	PW340	11/12/2023	0089_PW340_231211	Normal	EP2317576		<0.01	0.01	<0.01	<0.01	0.02	<0.01	<0.1	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
FTA	PW341	11/12/2023	0089_PW341_231211	Normal	EP2317576		<0.01	<0.01	<0.01	<0.01	0.02	<0.01	<0.1	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
WWTP (East)	PW345	13/12/2023	0089_PW345_231213	Normal	EP2317690		<0.01	<0.01	0.01	<0.01	0.03	<0.01	<0.1	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Accomodation Area	PW346	13/12/2023	0089_PW346_231213	Normal	EP2317701		<0.01	<0.01	0.06	<0.01	3.57	<0.01	<0.1	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
WWTP (West)	PW350	14/12/2023	0089_PW350_231214	Normal	EP2317756		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.1	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
WWTP (West)	PW351	14/12/2023	0089_PW351_231214	Normal	EP2317756		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.1	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
WWTP (West)	PW352	14/12/2023	0089_PW352_231214	Normal	EP2317756		<0.01	<0.01	0.01	<0.01	0.03	<0.01	<0.1	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Demolition Ground	PW356	19/12/2023	0089_PW356_231219	Normal	EP2318014		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.1	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Demolition Ground	PW357	19/12/2023	0089_PW357_231219	Normal	EP2318014		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.1	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Demolition Ground	PW358	19/12/2023	0089_PW358_231219	Normal	EP2318014		<0.01	0.01	<0.01	<0.01	<0.01	<0.01	<0.1	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
FTA	PW362	11/12/2023	0089_PW362_231211	Normal	EP2317576		<0.01	<0.01	<0.01	<0.01	0.01	<0.01	<0.1	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
FTA	PW363	11/12/2023	0089_PW363_231211	Normal	EP2317576		<0.01	<0.01	<0.01	<0.01	0.02	<0.01	<0.1	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
FTA	PW364	11/12/2023	0089_PW364_231211	Normal	EP2317576		<0.01	<0.01	<0.01	<0.01	0.01	<0.01	<0.1	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
FTA	PW364	11/12/2023	0089_QC106_231211	Field Duplicate	EP2317576		<0.01	0.01	<0.01	<0.01	0.01	<0.01	<0.1	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
FTA	PW364	11/12/2023	0089_QC206_231211	Interlab Duplicate	1053798		<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
WWTP (East)	PW367	13/12/2023	0089_PW367_231213	Normal	EP2317690		<0.01	<0.01	<0.01	<0.01	0.02	<0.01	<0.1	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
WWTP (East)	PW367	13/12/2023	0089_QC115_231213	Field Duplicate	EP2317690		<0.01	<0.01	<0.01	<0.01	0.02	<0.01	<0.1	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
WWTP (East)	PW367	13/12/2023	0089_QC215_231213	Interlab Duplicate	1053798		<0.01	<0.01	0.05	<0.01	0.06	<0.01	<0.05	0.05	0.04	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
WWTP (East)	PW368	13/12/2023	0089_PW368_231213	Normal	EP2317701		<0.01	<0.01	<0.01	<0.01	0.08	<0.01	<0.1	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
WWTP (East)	PW369	13/12/2023	0089_PW369_231213	Normal	EP2317690		<0.01	<0.01	<0.01	<0.01	0.02	<0.01	<0.1	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Dredge Spoil / Careening Bay	PW374	12/12/2023	0089_PW374_231212	Normal	EP2317629		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.1	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Dredge Spoil / Careening Bay	PW375	12/12/2023	0089_PW375_231212	Normal	EP2317629		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.1	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Dredge Spoil / Careening Bay	PW378	12/12/2023	0089_PW378_231212	Normal	EP2317629		<0.01	<0.01	<0.01	<0.01	0.02	<0.01	<0.1	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Dredge Spoil / Careening Bay	PW378	12/12/2023	0089_QC110_231212	Field Duplicate	EP2317629		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.1	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Dredge Spoil / Careening Bay	PW378	12/12/2023	0089_QC210_231213	Interlab Duplicate	1053798		<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
WWTP (West)	PW380	14/12/2023	0089_PW380_231214	Normal	EP2317756		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.1	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
WWTP (West)	PW381	14/12/2023	0089_PW381_231214	Normal	EP2317756		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.1	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
WWTP (West)	PW401	14/12/2023	0089_PW401_231214	Normal	EP2317756		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.1	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
HSF	PW405	11/12/2023	0089_PW405_231211	Normal	EP2317554		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.1	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
HSF	PW405	11/12/2023	0089_QC103_231211	Field Duplicate	EP2317554		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.1	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
HSF	PW405	11/12/2023	0089_QC203_231211	Interlab Duplicate	1053798		<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
HSF	PW407	11/12/2023	0089_PW407_231211	Normal	EP2317554		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.1	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
HSF	PW409	11/12/2023	0089_PW409_231211	Normal	EP2317554		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.1	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
HSF	PW411	13/12/2023	0089_PW411_231213	Normal	EP2317850		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.1	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
HSF	PW413	13/12/2023	0089_PW413_231213	Normal	EP2317850		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.1	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
HSF	PW415	13/12/2023	0089_PW415_231213	Normal	EP2317850		<0.01	0.01	<0.01	<0.01	<0.01	<0.01	<0.1	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
FTA	SW130	11/12/2023	0089_SW130_231211	Normal	EP2317576		<0.01	<0.01	<0.01	<0.01	0.02	<0.01	<0.1	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
FTA	SW132	11/12/2023	0089_QC107_231211	Field Duplicate	EP2317576		<0.01	0.01	0.01	<0.01	0.06	<0.01	<0.1	0.02	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
FTA	SW132	11/12/2023	0089_QC207_231211	Interlab Duplicate	1053798		<0.01	<0.01	0.02	<0.01	0.03	<0.01	<0.05	<0.01	<0.01	0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
FTA	SW132	11/12/2023	0089_SW132_231211	Normal	EP2317576		<0.01	<0.01	0.01	<0.01	0.10	<0.01	<0.1	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
FTA	SW134	11/12/2023	0089_SW134_231211	Normal	EP2317576		<0.01	<0.01	<0.01	<0.01	0.02	<0.01	<0.1	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Demolition Ground	SW150	19/12/2023	0089_SW150_231219	Normal	EP2318014		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.1	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Demolition Ground	SW152	19/12/2023	0089_SW152_231219	Normal	EP2318014		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.1	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Demolition Ground	SW154	19/12/2023	0089_SW154_231219	Normal	EP2318014		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.1	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Demolition Ground	SW156	19/12/2023	0089_SW156_231219	Normal	EP2318014		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.1	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
WWTP (East)	SW305	13/12/2023	0089_SW305_231213	Normal	EP2317701		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.1	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
HSF	SW309	11/12/2023	0089_SW309_231211	Normal	EP2317576		<0.01	0.01	<0.01	<0.01	<0.01	<0.01	<0.1	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
HSF	SW310	11/12/2023	0089_SW310_231211	Normal	EP2317576		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.1	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
HSF	SW311	11/12/2023	0089_SW311_231211	Normal	EP2317576		<0.01	0.01	<0.01	<0.01	<0.01	<0.01	<0.1	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Dredge Spoil / Careening Bay	SW317	12/12/2023	0089_QC109_231212	Field Duplicate	EP2317629		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.1	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Dredge Spoil / Careening Bay	SW317	12/12/2023	0089_QC209_231212	Interlab Duplicate	1053798		<0.01	<0.01	<0.01	<0.01	0.02	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Dredge Spoil / Careening Bay	SW317	12/12/2023	0089_SW317_231212	Normal	EP2317629		<0.01	<0.01	<0.01	<0.01	0.02	<0.01	<0.1	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Dredge Spoil / Careening Bay	SW318	12/12/2023	0089_SW318_231212	Normal	EP2317629		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.1	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Dredge Spoil / Careening Bay	SW319	12/12/2023	0089_SW319_231212	Normal	EP2317629		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.1	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
WWTP (West)	SW353	14/12/2023	0089_SW353_231214	Normal	EP2317756		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.1	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
WWTP (East)	SW370	13/12/2023	0089_SW370_231213	Normal	EP2317690		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.1	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
WWTP (East)	SW371	13/12/2023	0089_SW371_231213	Normal	EP2317701		<0.01	<0.01	<0.01	<0.01	0.01	<0.01	<0.1	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
WWTP (East)	SW372	13/12/2023	0089_SW372_231213	Normal	EP2317701		<0.01	<0.01	0.04	<0.01	0.10	<0.01	<0.1	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
WWTP (West)	SW373	13/12/2023	0089_SW373_231213	Normal	EP2317701		<0.01	<0.01	0.02	<0.01	0.08	<0.01	<0.1	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
WWTP (West)	SW382	14/12/2023	0089_SW382_231214	Normal	EP2317756		0.03	<0.01	0.25	0.04	2.29	<0.01	<0.1	0.14	0.16	0.07	0.06	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
WWTP (West)	SW383	14/12/2023	0089_SW383_231214	Normal	EP2317756		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.1	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
WWTP (West)	SW384	14/12/2023	0089_SW384_231214	Normal	EP2317756		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.1	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
HSF	SW406	11/12/2023	0089_QC104_231211	Field Duplicate	EP2317554		<0.01	<0.01	<0.01	<0.01	0.01	<0.01	<0.1	0.04	0.07	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
HSF	SW406	11/12/2023	0089_QC204_231211	Interlab Duplicate	1053798		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	0.02	0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
HSF	SW406	11/12/2023	0089_SW406_231211	Normal	EP2317554		<0.01	<0.01	<0.01	<0.01	0.01	<0.01	<0.1	0.04	0.07	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
HSF	SW408	11/12/2023	0089_SW408_231211	Normal	EP2317554		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.1	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
HSF	SW410	11/12/2023	0089_SW410_231211	Normal	EP2317554		<0.01	<0.01	0.02	<0.01	<0.01	<0.01	<0.1	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
HSF	SW412	13/12/2023	0089_SW412_231213	Normal	EP2317850		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.1	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
HSF	SW414	13/12/2023	0089_SW414_231213	Normal	EP2317850		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.1	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
HSF	SW416	13/12/2023	0089_SW416_231213	Normal	EP2317850		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.1	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01

Environmental Standards
HEPA, January 2020, PFAS NEMP 2020 Drinking Water
HEPA, January 2020, PFAS NEMP 2020 Freshwater 99%
HEPA, January 2020, PFAS NEMP 2020 Recreational Water
Env Stds Comments
*Practical screening guideline of 0.01 µg/L adopted base on typical current laboratory limit of reporting.
Notes:
First-time detection of PFOA or PFOS+PFHxS
New exceedance of guideline value

						PFAS - (n:2) Fluorotelomer Sulfonic Acids				PFAS - Perfluoroalkyl Sulfonamides							PFAS		
						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 (WA DER List)	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
LOR - Limit of Reporting						0.01	0.05	0.01	0.01	0.02	0.05	0.02	0.05	0.05	0.02	0.05	0.01	0.01	0.01
PFAS NEMP 2020 Drinking Water																	*0.07*		
PFAS NEMP 2020 Freshwater 99%																			
PFAS NEMP 2020 Recreational Water																	2		
Monitoring Area	**Location Code**	**Date**	**Field ID**	**Sample Type**	**Lab Report Number**														
FTA	MW109	12/12/2023	0089_MW109_231212	Normal	EP2317628	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.05	<0.05	*0.50*	0.62	0.73
FTA	MW112	12/12/2023	0089_MW112_231212	Normal	EP2317628	<0.05	0.11	<0.05	<0.05	0.45	<0.05	<0.02	<0.05	<0.05	<0.05	<0.05	*31.6*	33.6	34.6
FTA	MW112	12/12/2023	0089_QC113_231212	Field Duplicate	EP2317628	<0.05	0.11	<0.05	<0.05	0.44	<0.05	<0.02	<0.05	<0.05	<0.05	<0.05	*31.8*	33.8	34.8
FTA	MW112	12/12/2023	0089_QC213_231212	Interlab Duplicate	1053798	<0.05	0.10	0.01	<0.01	0.23	<0.05	<0.02	<0.05	<0.05	<0.05	<0.05	*18.9*	20.46	21.09
FTA	MW120	12/12/2023	0089_MW120_231212	Normal	EP2317628	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.05	<0.05	*2.08*	2.26	2.53
FTA	MW120	12/12/2023	0089_QC112_231212	Field Duplicate	EP2317628	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.05	<0.05	*2.01*	2.15	2.41
FTA	MW120	12/12/2023	0089_QC212_231212	Interlab Duplicate	1053798	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.05	<0.05	*2.01*	2.15	2.41
FTA	MW121	12/12/2023	0089_MW121_231212	Normal	EP2317628	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.05	<0.05	*0.20*	0.21	0.21
FTA	MW123	12/12/2023	0089_MW123_231212	Normal	EP2317628	<0.05	<0.05	<0.05	<0.05	0.10	<0.05	<0.02	<0.05	<0.05	<0.05	<0.05	*55.9*	60.6	63.2
FTA	MW123	12/12/2023	0089_QC108_231212	Field Duplicate	EP2317628	<0.05	<0.05	<0.05	<0.05	0.11	<0.05	<0.02	<0.05	<0.05	<0.05	<0.05	*58.3*	63.2	66.1
FTA	MW123	12/12/2023	0089_QC208_231212	Interlab Duplicate	1053798	<0.05	0.05	<0.01	<0.01	0.09	<0.05	<0.02	<0.05	<0.05	<0.05	<0.05	*47*	50.75	53.31
FTA	MW124	11/12/2023	0089_MW124_231211	Normal	EP2317575	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.01	<0.01
FTA	MW125	11/12/2023	0089_MW125_231211	Normal	EP2317575	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.05	<0.05	*0.33*	0.54	0.65
FTA	MW126	11/12/2023	0089_MW126_231211	Normal	EP2317575	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.01	<0.01
FTA	MW127	11/12/2023	0089_MW127_231211	Normal	EP2317575	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.01	<0.01
FTA	MW128	12/12/2023	0089_MW128_231212	Normal	EP2317628	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.01	<0.01
Demolition Ground	MW139	19/12/2023	0089_MW139_231219	Normal	EP2318017	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.01	<0.01
Demolition Ground	MW141	19/12/2023	0089_MW141_231219	Normal	EP2318017	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.05	<0.05	*66.1*	84.4	86.1
Demolition Ground	MW142	19/12/2023	0089_MW142_231219	Normal	EP2318017	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.05	<0.05	*8.72*	12.3	12.7
Demolition Ground	MW147	19/12/2023	0089_MW147_231219	Normal	EP2318017	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.05	<0.05	0.03	0.03	0.03
Demolition Ground	MW149	19/12/2023	0089_MW149_231219	Normal	EP2318017	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.01	<0.01
WWTP	MW158	12/12/2023	0089_MW158_231212	Normal	EP2317628	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.01	<0.01
WWTP	MW166	12/12/2023	0089_MW166_231212	Normal	EP2317628	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.05	<0.05	*3.50*	3.58	3.67
WWTP	MW171	12/12/2023	0089_MW171_231212	Normal	EP2317628	<0.05	0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.05	<0.05	*1.21*	2.64	2.97
WWTP	MW173	13/12/2023	0089_MW173_231213	Normal	EP2317729	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.05	<0.05	*3.75*	4.29	4.62
WWTP	MW193	13/12/2023	0089_MW193_231213	Normal	EP2317729	<0.05	0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.05	<0.05	*6.68*	8.70	9.66
WWTP	MW195D	13/12/2023	0089_MW195D_231213	Normal	EP2317729	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.01	<0.01
WWTP	MW199	12/12/2023	0089_MW199_231212	Normal	EP2317628	<0.05	0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.05	<0.05	0.01	0.01	0.01
WWTP	MW200	13/12/2023	0089_MW200_231213	Normal	EP2317729	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.01	<0.01
WWTP	MW202	13/12/2023	0089_MW202_231213	Normal	EP2317700	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.05	<0.05	0.06	0.06	0.06
WWTP	MW202	13/12/2023	0089_QC117_231213	Field Duplicate	EP2317700	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.05	<0.05	0.06	0.06	0.06
WWTP	MW202	13/12/2023	0089_QC217_231213	Interlab Duplicate	1053798	<0.05	<0.05	<0.05	<0.01	<0.02	<0.05	<0.02	<0.05	<0.05	<0.05	<0.05	0.05	0.05	<0.1
WWTP	MW203	12/12/2023	0089_MW203_231212	Normal	EP2317628	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.05	<0.05	0.07	0.07	0.10
HSF	MW215	11/12/2023	0089_MW215_231211	Normal	EP2317555	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.05	<0.05	*0.58*	0.77	0.84
HSF	MW216	11/12/2023	0089_MW216_231211	Normal	EP2317575	<0.05	1.30	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.05	<0.05	*1.63*	24.5	24.6
HSF	MW217	13/12/2023	0089_MW217_231213	Normal	EP2317849	<0.05	21.4	0.29	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.05	<0.05	*0.33*	36.3	36.3
HSF	MW217	13/12/2023	0089_QC118_231213	Field Duplicate	EP2317849	<0.05	24.8	0.28	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.05	<0.05	*0.49*	39.3	39.3
HSF	MW217	13/12/2023	0089_QC218_231213	Interlab Duplicate	1053798	0.02	11	0.27	<0.01	<0.02	<0.05	<0.02	<0.05	<0.05	<0.05	<0.05	*0.17*	24.27	24.33
HSF	MW220	13/12/2023	0089_MW220_231213	Normal	EP2317849	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.05	<0.05	*4.60*	4.92	5.00
HSF	MW224	13/12/2023	0089_MW224_231213	Normal	EP2317849	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.01	<0.01
HSF	MW225	11/12/2023	0089_MW225_231211	Normal	EP2317555	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.01	<0.01
HSF	MW226	11/12/2023	0089_MW226_231211	Normal	EP2317575	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.01	<0.01
HSF	MW227	11/12/2023	0089_MW227_231211	Normal	EP2317555	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.01	<0.01
HSF	MW228	11/12/2023	0089_MW228_231211	Normal	EP2317555	<0.05	1.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.05	<0.05	*0.49*	13.6	13.8
HSF	MW228	11/12/2023	0089_QC102_231211	Field Duplicate	EP2317555	<0.05	0.85	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.05	<0.05	*0.56*	12.5	12.7
HSF	MW228	11/12/2023	0089_QC202_231211	Interlab Duplicate	1053798	<0.05	0.78	<0.01	<0.01	<0.02	<0.05	<0.02	<0.05	<0.05	<0.05	<0.05	*0.75*	14.42	14.9
AVCAT Storage and Fuel Farm	MW233	13/12/2023	0089_MW233_231213	Normal	EP2317700	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.05	<0.05	*0.17*	0.17	0.17
AVCAT Storage and Fuel Farm	MW236	13/12/2023	0089_MW236_231213	Normal	EP2317849	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.05	<0.05	*69.3*	71.9	75.2
AVCAT Storage and Fuel Farm	MW238	12/12/2023	0089_MW238_231212	Normal	EP2317627	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.05	<0.05	0.02	0.02	0.02
AVCAT Storage and Fuel Farm	MW239	12/12/2023	0089_MW239_231212	Normal	EP2317627	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.05	<0.05	0.02	0.02	0.02
AVCAT Storage and Fuel Farm	MW240	12/12/2023	0089_MW240_231212	Normal	EP2317627	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.05	<0.05	*3.84*	4.08	4.16
AVCAT Storage and Fuel Farm	MW242	13/12/2023	0089_MW242_231213	Normal	EP2317700	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.05	<0.05	0.01	0.01	0.01
AVCAT Storage and Fuel Farm	MW243	12/12/2023	0089_MW243_231212	Normal	EP2317627	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.05	<0.05	*0.09*	0.09	0.09
AVCAT Storage and Fuel Farm	MW245	12/12/2023	0089_MW245_231212	Normal	EP2317627	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.05	<0.05	0.02	0.02	0.02
AVCAT Storage and Fuel Farm	MW249	12/12/2023	0089_MW249_231212	Normal	EP2317627	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.05	<0.05	*0.29*	0.29	0.29
	MW255	13/12/2023	0089_MW255_231213	Normal	EP2317700	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.05	<0.05	*3.30*	4.88	5.36
	MW256	13/12/2023	0089_MW256_231213	Normal	EP2317700	<0.05	0.36	<0.05	<0.05	0.02	<0.05	<0.02	<0.05	<0.05	<0.05	<0.05	*12.1*	22.9	26.3
	MW257	13/12/2023	0089_MW257_231213	Normal	EP2317700	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.05	<0.05	*0.21*	0.55	0.55
	MW258	13/12/2023	0089_MW258_231213	Normal	EP2317700	<0.05	0.16	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.05	<0.05	*19.6*	36.2	42.4
Fire Station,	MW259	13/12/2023	0089_MW259_231213	Normal	EP2317700	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.05	<0.05	*0.11*	0.21	0.21
Flammable/Hazardous Goods	MW259	13/12/2023	0089_QC114_231213	Field Duplicate	EP2317700	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.05	<0.05	*0.11*	0.21	0.21
and Waste Storage, Ship Sullage	MW259	13/12/2023	0089_QC214_231213	Interlab Duplicate	1053798	<0.05	<0.05	<0.05	<0.01	<0.02	<0.05	<0.02	<0.05	<0.05	<0.05	<0.05	*0.12*	0.23	0.23
Dredge Spoil / Careening Bay	MW268	12/12/2023	0089_MW268_231212	Normal	EP2317627	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.05	<0.05	*0.33*	0.40	0.47
Dredge Spoil / Careening Bay	MW269	12/12/2023	0089_MW269_231212	Normal	EP2317627	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.05	<0.05	*0.69*	0.92	1.01
HSF	MW282	13/12/2023	0089_MW282_231213	Normal	EP2317849	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.05	<0.05	*91.6*	106	117
Accomodation Area	MW288	13/12/2023	0089_MW288_231213	Normal	EP2317700	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.05	<0.05	*0.33*	0.33	0.33
Accomodation Area	MW289	11/12/2023	0089_MW289_231211	Normal	EP2317575	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.05	<0.05	*1.78*	1.91	1.98
AVCAT Storage and Fuel Farm	MW496	12/12/2023	0089_MW496_231212	Normal	EP2317627	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.05	<0.05	*7.83*	8.05	8.19
FTA	MW500	12/12/2023	0089_MW500_231212	Normal	EP2317628	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.05	<0.05	*79.2*	89.0	94.1
AVCAT Storage and Fuel Farm	MW516	12/12/2023	0089_MW516_231212	Normal	EP2317627	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.05	<0.05	*4.53*	4.59	4.65
WWTP (East)	PW304	13/12/2023	0089_PW304_231213	Normal	EP2317701	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.01	<0.01
HSF	PW306	11/12/2023	0089_PW306_231211	Normal	EP2317576	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.05	<0.05	0.05	0.05	0.05
HSF	PW307	11/12/2023	0089_PW307_231211	Normal	EP2317576	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.01	<0.01

						PFAS - (n:2) Fluorotelomer Sulfonic Acids				PFAS - Perfluoroalkyl Sulfonamides							PFAS		
						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 (WA DER List)	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
LOR - Limit of Reporting						0.01	0.05	0.01	0.01	0.02	0.05	0.02	0.05	0.05	0.02	0.05	0.01	0.01	0.01
PFAS NEMP 2020 Drinking Water																	*0.07*		
PFAS NEMP 2020 Freshwater 99%																			
PFAS NEMP 2020 Recreational Water																	**2**		
Monitoring Area	**Location Code**	**Date**	**Field ID**	**Sample Type**	**Lab Report Number**														
HSF	PW308	11/12/2023	0089_PW308_231211	Normal	EP2317576	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.05	<0.05	<0.01	<0.01	<0.01
HSF	PW314	11/12/2023	0089_PW314_231211	Normal	EP2317576	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.05	<0.05	<0.01	<0.01	<0.01
HSF	PW315	11/12/2023	0089_PW315_231211	Normal	EP2317576	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.05	<0.05	<0.01	<0.01	<0.01
HSF	PW316	11/12/2023	0089_PW316_231211	Normal	EP2317576	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.05	<0.05	<0.01	<0.01	<0.01
Demolition Ground	PW329	19/12/2023	0089_PW329_231219	Normal	EP2318014	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.05	<0.05	<0.01	<0.01	<0.01
Demolition Ground	PW330	19/12/2023	0089_PW330_231219	Normal	EP2318014	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.05	<0.05	<0.01	<0.01	<0.01
Demolition Ground	PW331	19/12/2023	0089_PW331_231219	Normal	EP2318014	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.05	<0.05	<0.01	<0.01	<0.01
FTA	PW335	11/12/2023	0089_PW335_231211	Normal	EP2317576	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.05	<0.05	0.01	0.01	0.01
FTA	PW340	11/12/2023	0089_PW340_231211	Normal	EP2317576	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.05	<0.05	0.02	0.02	0.02
FTA	PW341	11/12/2023	0089_PW341_231211	Normal	EP2317576	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.05	<0.05	0.02	0.02	0.02
WWTP (East)	PW345	13/12/2023	0089_PW345_231213	Normal	EP2317690	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.05	<0.05	0.03	0.03	0.03
Accomodation Area	PW346	13/12/2023	0089_PW346_231213	Normal	EP2317701	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.05	<0.05	3.63	3.63	3.63
WWTP (West)	PW350	14/12/2023	0089_PW350_231214	Normal	EP2317756	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.05	<0.05	<0.01	<0.01	<0.01
WWTP (West)	PW351	14/12/2023	0089_PW351_231214	Normal	EP2317756	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.05	<0.05	<0.01	<0.01	<0.01
WWTP (West)	PW352	14/12/2023	0089_PW352_231214	Normal	EP2317756	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.05	<0.05	0.04	0.04	0.04
Demolition Ground	PW356	19/12/2023	0089_PW356_231219	Normal	EP2318014	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.05	<0.05	<0.01	<0.01	<0.01
Demolition Ground	PW357	19/12/2023	0089_PW357_231219	Normal	EP2318014	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.05	<0.05	<0.01	<0.01	<0.01
Demolition Ground	PW358	19/12/2023	0089_PW358_231219	Normal	EP2318014	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.05	<0.05	<0.01	<0.01	<0.01
FTA	PW362	11/12/2023	0089_PW362_231211	Normal	EP2317576	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.05	<0.05	0.01	0.01	0.01
FTA	PW363	11/12/2023	0089_PW363_231211	Normal	EP2317576	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.05	<0.05	0.02	0.02	0.02
FTA	PW364	11/12/2023	0089_PW364_231211	Normal	EP2317576	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.05	<0.05	0.01	0.01	0.01
FTA	PW364	11/12/2023	0089_QC106_231211	Field Duplicate	EP2317576	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.05	<0.05	0.01	0.01	0.01
FTA	PW364	11/12/2023	0089_QC206_231211	Interlab Duplicate	1053798	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.05	<0.05	0.01	0.01	0.01
WWTP (East)	PW367	13/12/2023	0089_PW367_231213	Normal	EP2317690	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.05	<0.05	0.02	0.02	0.02
WWTP (East)	PW367	13/12/2023	0089_QC115_231213	Field Duplicate	EP2317690	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.05	<0.05	0.02	0.02	0.02
WWTP (East)	PW367	13/12/2023	0089_QC215_231213	Interlab Duplicate	1053798	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.05	<0.05	*0.11*	0.2	0.2
WWTP (East)	PW368	13/12/2023	0089_PW368_231213	Normal	EP2317701	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.05	<0.05	*0.08*	0.08	0.08
WWTP (East)	PW369	13/12/2023	0089_PW369_231213	Normal	EP2317690	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.05	<0.05	0.02	0.02	0.02
Dredge Spoil / Careening Bay	PW374	12/12/2023	0089_PW374_231212	Normal	EP2317629	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.05	<0.05	<0.01	<0.01	<0.01
Dredge Spoil / Careening Bay	PW375	12/12/2023	0089_PW375_231212	Normal	EP2317629	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.05	<0.05	<0.01	<0.01	<0.01
Dredge Spoil / Careening Bay	PW378	12/12/2023	0089_PW378_231212	Normal	EP2317629	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.05	<0.05	0.02	0.02	0.02
Dredge Spoil / Careening Bay	PW378	12/12/2023	0089_QC110_231212	Field Duplicate	EP2317629	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.05	<0.05	<0.01	<0.01	<0.01
Dredge Spoil / Careening Bay	PW378	12/12/2023	0089_QC210_231213	Interlab Duplicate	1053798	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.05	<0.05	<0.01	<0.01	<0.01
WWTP (West)	PW380	14/12/2023	0089_PW380_231214	Normal	EP2317756	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.05	<0.05	<0.01	<0.01	<0.01
WWTP (West)	PW381	14/12/2023	0089_PW381_231214	Normal	EP2317756	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.05	<0.05	<0.01	<0.01	<0.01
WWTP (West)	PW401	14/12/2023	0089_PW401_231214	Normal	EP2317756	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.05	<0.05	<0.01	<0.01	<0.01
HSF	PW405	11/12/2023	0089_PW405_231211	Normal	EP2317554	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.05	<0.05	<0.01	<0.01	<0.01
HSF	PW405	11/12/2023	0089_QC103_231211	Field Duplicate	EP2317554	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.05	<0.05	<0.01	<0.01	<0.01
HSF	PW405	11/12/2023	0089_QC203_231211	Interlab Duplicate	1053798	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.05	<0.05	<0.01	<0.01	<0.01
HSF	PW407	11/12/2023	0089_PW407_231211	Normal	EP2317554	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.05	<0.05	<0.01	<0.01	<0.01
HSF	PW409	11/12/2023	0089_PW409_231211	Normal	EP2317554	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.05	<0.05	<0.01	<0.01	<0.01
HSF	PW411	13/12/2023	0089_PW411_231213	Normal	EP2317850	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.05	<0.05	<0.01	<0.01	<0.01
HSF	PW413	13/12/2023	0089_PW413_231213	Normal	EP2317850	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.05	<0.05	<0.01	<0.01	<0.01
HSF	PW415	13/12/2023	0089_PW415_231213	Normal	EP2317850	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.05	<0.05	<0.01	<0.01	<0.01
FTA	SW130	11/12/2023	0089_SW130_231211	Normal	EP2317576	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.05	<0.05	0.02	0.02	0.02
FTA	SW132	11/12/2023	0089_QC107_231211	Field Duplicate	EP2317576	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.05	<0.05	0.07	0.07	0.07
FTA	SW132	11/12/2023	0089_QC207_231211	Interlab Duplicate	1053798	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.05	<0.05	0.05	0.1	0.1
FTA	SW132	11/12/2023	0089_SW132_231211	Normal	EP2317576	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.05	<0.05	*0.11*	0.11	0.11
FTA	SW134	11/12/2023	0089_SW134_231211	Normal	EP2317576	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.05	<0.05	0.02	0.02	0.02
Demolition Ground	SW150	19/12/2023	0089_SW150_231219	Normal	EP2318014	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.05	<0.05	<0.01	<0.01	<0.01
Demolition Ground	SW152	19/12/2023	0089_SW152_231219	Normal	EP2318014	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.05	<0.05	<0.01	<0.01	<0.01
Demolition Ground	SW154	19/12/2023	0089_SW154_231219	Normal	EP2318014	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.05	<0.05	<0.01	<0.01	<0.01
Demolition Ground	SW156	19/12/2023	0089_SW156_231219	Normal	EP2318014	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.05	<0.05	<0.01	<0.01	<0.01
WWTP (East)	SW305	13/12/2023	0089_SW305_231213	Normal	EP2317701	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.05	<0.05	<0.01	<0.01	<0.01
HSF	SW309	11/12/2023	0089_SW309_231211	Normal	EP2317576	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.05	<0.05	<0.01	<0.01	<0.01
HSF	SW310	11/12/2023	0089_SW310_231211	Normal	EP2317576	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.05	<0.05	<0.01	<0.01	<0.01
HSF	SW311	11/12/2023	0089_SW311_231211	Normal	EP2317576	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.05	<0.05	<0.01	<0.01	<0.01
Dredge Spoil / Careening Bay	SW317	12/12/2023	0089_QC109_231212	Field Duplicate	EP2317629	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.05	<0.05	<0.01	<0.01	<0.01
Dredge Spoil / Careening Bay	SW317	12/12/2023	0089_QC209_231212	Interlab Duplicate	1053798	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.05	<0.05	0.02	0.02	0.02
Dredge Spoil / Careening Bay	SW317	12/12/2023	0089_SW317_231212	Normal	EP2317629	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.05	<0.05	0.02	0.02	0.02
Dredge Spoil / Careening Bay	SW318	12/12/2023	0089_SW318_231212	Normal	EP2317629	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.05	<0.05	<0.01	<0.01	<0.01
Dredge Spoil / Careening Bay	SW319	12/12/2023	0089_SW319_231212	Normal	EP2317629	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.05	<0.05	<0.01	<0.01	<0.01
WWTP (West)	SW353	14/12/2023	0089_SW353_231214	Normal	EP2317756	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.05	<0.05	<0.01	<0.01	<0.01
WWTP (East)	SW370	13/12/2023	0089_SW370_231213	Normal	EP2317690	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.05	<0.05	<0.01	<0.01	<0.01
WWTP (East)	SW371	13/12/2023	0089_SW371_231213	Normal	EP2317701	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.05	<0.05	0.01	0.01	0.01
WWTP (East)	SW372	13/12/2023	0089_SW372_231213	Normal	EP2317701	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.05	<0.05	*0.14*	0.14	0.14
WWTP (West)	SW373	13/12/2023	0089_SW373_231213	Normal	EP2317701	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.05	<0.05	*0.10*	0.10	0.10
WWTP (West)	SW382	14/12/2023	0089_SW382_231214	Normal	EP2317756	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.05	<0.05	***2.54***	3.00	3.04
WWTP (West)	SW383	14/12/2023	0089_SW383_231214	Normal	EP2317756	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.05	<0.05	<0.01	<0.01	<0.01
WWTP (West)	SW384	14/12/2023	0089_SW384_231214	Normal	EP2317756	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.05	<0.05	<0.01	<0.01	<0.01
HSF	SW406	11/12/2023	0089_QC104_231211	Field Duplicate	EP2317554	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.05	<0.05	0.01	0.12	0.12
HSF	SW406	11/12/2023	0089_QC204_231211	Interlab Duplicate	1053798	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.05	<0.05	<0.01	0.07	0.07
HSF	SW406	11/12/2023	0089_SW406_231211	Normal	EP2317554	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.05	<0.05	0.01	0.12	0.12
HSF	SW408	11/12/2023	0089_SW408_231211	Normal	EP2317554	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.05	<0.05	<0.01	<0.01	<0.01
HSF	SW410	11/12/2023	0089_SW410_231211	Normal	EP2317554	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.05	<0.05	0.02	0.02	0.02
HSF	SW412	13/12/2023	0089_SW412_231213	Normal	EP2317850	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.05	<0.05	<0.01	<0.01	<0.01
HSF	SW414	13/12/2023	0089_SW414_231213	Normal	EP2317850	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.05	<0.05	<0.01	<0.01	<0.01
HSF	SW416	13/12/2023	0089_SW416_231213	Normal	EP2317850	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.05	<0.05	<0.01	<0.01	<0.01

Environmental Standards
HEPA, January 2020, PFAS NEMP 2020 Drinking Water
HEPA, January 2020, PFAS NEMP 2020 Freshwater 99%
HEPA, January 2020, PFAS NEMP 2020 Recreational Water
Env Stds Comments
*Practical screening guideline of 0.01 µg/L adopted base on typical current laboratory limit of reporting.
Notes:
First-time detection of PFOA or PFOS+PFHxS
New exceedance of guideline value

						Inorganics									Metals			
						Carbonate Alkalinity (as CaCO3)	Alkalinity (Bicarbonate as CaCO3)	Alkalinity (Hydroxide) as CaCO3	Alkalinity (total) as CaCO3	Anions Total	Cations Total	Chloride	Ionic Balance	Sulphate as SO4 - Turbidimetric (filtered)	Calcium (filtered)	Magnesium (filtered)	Potassium (filtered)	Sodium (filtered)
						mg/L	mg/L	mg/L	mg/L	meq/L	meq/L	mg/L	%	mg/L	mg/L	mg/L	mg/L	mg/L
LOR - Limit of Reporting						1	1	1	1	0.01	0.01	1	0.01	1	1	1	1	1
PFAS NEMP 2020 Drinking Water																		
PFAS NEMP 2020 Freshwater 99%																		
PFAS NEMP 2020 Recreational Water																		
Monitoring Area	Location Code	Date	Field ID	Sample Type	Lab Report Number													
FTA	MW109	12/12/2023	0089_MW109_231212	Normal	EP2317628		320		320	8.72	9.20	67	2.68	21	105	18		57
FTA	MW112	12/12/2023	0089_MW112_231212	Normal	EP2317628		217		217	5.22	5.29	21	0.69	14	79	9		14
FTA	MW112	12/12/2023	0089_QC113_231212	Field Duplicate	EP2317628		215		215	5.15	5.29	20	1.34	14	79	9		14
FTA	MW112	12/12/2023	0089_QC213_231212	Interlab Duplicate	1053798													
FTA	MW120	12/12/2023	0089_MW120_231212	Normal	EP2317628		252		252	6.84	7.37	53	3.71	15	81	21	3	35
FTA	MW120	12/12/2023	0089_QC112_231212	Field Duplicate	EP2317628		253		253	6.92	7.32	52	2.87	19	81	21	3	34
FTA	MW120	12/12/2023	0089_QC212_231212	Interlab Duplicate	1053798													
FTA	MW121	12/12/2023	0089_MW121_231212	Normal	EP2317628		295		295	6.41	5.35	13	9.02	7	75	12	2	13
FTA	MW123	12/12/2023	0089_MW123_231212	Normal	EP2317628		226		226	6.11	6.88	44	5.91	17	87	15	5	27
FTA	MW123	12/12/2023	0089_QC108_231212	Field Duplicate	EP2317628		227		227	6.13	6.93	44	6.11	17	88	15	5	27
FTA	MW123	12/12/2023	0089_QC208_231212	Interlab Duplicate	1053798													
FTA	MW124	11/12/2023	0089_MW124_231211	Normal	EP2317575		416		416	518	520	16,600	0.13	2,000	455	1,150	454	8,980
FTA	MW125	11/12/2023	0089_MW125_231211	Normal	EP2317575		402		402	505	474	16,100	3.20	2,050	419	1,060	410	8,160
FTA	MW126	11/12/2023	0089_MW126_231211	Normal	EP2317575		661		661	407	399	12,900	0.92	1,430	342	962	324	6,780
FTA	MW127	11/12/2023	0089_MW127_231211	Normal	EP2317575		643		643	484	481	15,500	0.28	1,620	347	1,140	402	8,270
FTA	MW128	12/12/2023	0089_MW128_231212	Normal	EP2317628		389		389	13.1	13.0	174	0.69	22	114	41	6	86
Demolition Ground	MW139	19/12/2023	0089_MW139_231219	Normal	EP2318017		204		204	31.6	32.9	913	1.91	87	124	67	25	472
Demolition Ground	MW141	19/12/2023	0089_MW141_231219	Normal	EP2318017		586		586	263	240	8,190	4.56	976	334	548	153	4,010
Demolition Ground	MW142	19/12/2023	0089_MW142_231219	Normal	EP2318017		458		458	342	319	10,800	3.40	1,350	379	741	266	5,350
Demolition Ground	MW147	19/12/2023	0089_MW147_231219	Normal	EP2318017		355		355	328	310	10,300	2.70	1,440	320	729	270	5,230
Demolition Ground	MW149	19/12/2023	0089_MW149_231219	Normal	EP2318017		484		484	218	220	6,510	0.34	1,200	234	534	194	3,660
WWTP	MW158	12/12/2023	0089_MW158_231212	Normal	EP2317628		444		444	141	142	4,360	0.36	452	199	334	104	2,350
WWTP	MW166	12/12/2023	0089_MW166_231212	Normal	EP2317628		440		440	38.1	40.2	923	2.69	156	143	98	48	546
WWTP	MW171	12/12/2023	0089_MW171_231212	Normal	EP2317628		464		464	136	139	4,090	1.20	530	180	339	114	2,280
WWTP	MW173	13/12/2023	0089_MW173_231213	Normal	EP2317729		481		481	28.3	28.7	593	0.67	96	147	86	22	316
WWTP	MW193	13/12/2023	0089_MW193_231213	Normal	EP2317729		677		677	30.8	26.7	478	7.00	180	126	85	14	301
WWTP	MW195D	13/12/2023	0089_MW195D_231213	Normal	EP2317729		371		371	234	257	7,120	4.73	1,220	316	606	214	4,270
WWTP	MW199	12/12/2023	0089_MW199_231212	Normal	EP2317628		913		913	187	184	5,720	0.75	365	236	407	134	3,120
WWTP	MW200	13/12/2023	0089_MW200_231213	Normal	EP2317729		441		441	67.8	69.0	1,940	0.85	204	81	101	70	1,260
WWTP	MW202	13/12/2023	0089_MW202_231213	Normal	EP2317700		355		355	12.7	13.1	162	1.61	48	94	25	11	139
WWTP	MW202	13/12/2023	0089_QC117_231213	Field Duplicate	EP2317700		355		355	12.6	13.0	162	1.52	45	94	25	11	137
WWTP	MW202	13/12/2023	0089_QC217_231213	Interlab Duplicate	1053798													
WWTP	MW203	12/12/2023	0089_MW203_231212	Normal	EP2317628		403		403	13.6	13.1	109	1.94	119	88	54	8	93
HSF	MW215	11/12/2023	0089_MW215_231211	Normal	EP2317555		308		308	14.6	13.6	248	3.76	71	117	28	8	120
HSF	MW216	11/12/2023	0089_MW216_231211	Normal	EP2317575		267		267	22.5	22.8	511	0.66	133	136	49	10	270
HSF	MW217	13/12/2023	0089_MW217_231213	Normal	EP2317849		1,190		1,190	25.2	8.58	34	49.3	24	116	15	8	31
HSF	MW217	13/12/2023	0089_QC118_231213	Field Duplicate	EP2317849		1,480		1,480	31.0	8.00	32	59.0	27	107	14	8	30
HSF	MW217	13/12/2023	0089_QC218_231213	Interlab Duplicate	1053798													
HSF	MW220	13/12/2023	0089_MW220_231213	Normal	EP2317849		254		254	8.26	8.45	99	1.11	19	107	15	7	39
HSF	MW224	13/12/2023	0089_MW224_231213	Normal	EP2317849		526		526	14.4	9.50	107	20.4	40	58	25	6	101
HSF	MW225	11/12/2023	0089_MW225_231211	Normal	EP2317555		335		335	25.3	23.6	619	3.54	55	139	53	7	278
HSF	MW226	11/12/2023	0089_MW226_231211	Normal	EP2317575	21	116		137	685	741	22,000	3.96	2,950	512	1,620	658	13,000
HSF	MW227	11/12/2023	0089_MW227_231211	Normal	EP2317555		426		426	29.2	27.2	577	3.68	214	101	67	22	369
HSF	MW228	11/12/2023	0089_MW228_231211	Normal	EP2317555		654		654	104	106	2,820	1.30	524	126	264	100	1,740
HSF	MW228	11/12/2023	0089_QC102_231211	Field Duplicate	EP2317555		587		587	160	151	4,780	2.86	652	156	350	128	2,560
HSF	MW228	11/12/2023	0089_QC202_231211	Interlab Duplicate	1053798													
AVCAT Storage and Fuel Farm	MW233	13/12/2023	0089_MW233_231213	Normal	EP2317700		158		158	4.11	4.56	28	5.16	8	54	8	3	26
AVCAT Storage and Fuel Farm	MW236	13/12/2023	0089_MW236_231213	Normal	EP2317849		281		281	6.76	6.99	28	1.69	17	92	17		23
AVCAT Storage and Fuel Farm	MW238	12/12/2023	0089_MW238_231212	Normal	EP2317627		243		243	6.52	7.34	31	5.94	38	92	15	5	32
AVCAT Storage and Fuel Farm	MW239	12/12/2023	0089_MW239_231212	Normal	EP2317627													
AVCAT Storage and Fuel Farm	MW240	12/12/2023	0089_MW240_231212	Normal	EP2317627		247		247	6.99	8.26	44	8.32	39	114	12	4	34
AVCAT Storage and Fuel Farm	MW242	13/12/2023	0089_MW242_231213	Normal	EP2317700		175		175	4.59	4.92	21	3.44	24	68	11	2	13
AVCAT Storage and Fuel Farm	MW243	12/12/2023	0089_MW243_231212	Normal	EP2317627		305		305	9.08	10.3	58	6.26	65	130	18	6	50
AVCAT Storage and Fuel Farm	MW245	12/12/2023	0089_MW245_231212	Normal	EP2317627		349		349	7.76	7.99	25	1.43	4	118	14	3	20
AVCAT Storage and Fuel Farm	MW249	12/12/2023	0089_MW249_231212	Normal	EP2317627		457		457	14.3	13.2	147	4.07	50	101	42	7	104
	MW255	13/12/2023	0089_MW255_231213	Normal	EP2317700		246		246	7.00	7.71	48	4.86	35	84	13	4	54
	MW256	13/12/2023	0089_MW256_231213	Normal	EP2317700		385		385	12.2	12.1	139	0.65	30	118	24	5	94
	MW257	13/12/2023	0089_MW257_231213	Normal	EP2317700		216		216	5.75	5.49	37	2.33	19	70	9	5	26
	MW258	13/12/2023	0089_MW258_231213	Normal	EP2317700		387		387	13.2	14.2	114	3.85	106	141	38	17	83
Fire Station,	MW259	13/12/2023	0089_MW259_231213	Normal	EP2317700		285		285	6.80	7.22	29	2.98	14	95	16	3	25
Flammable/Hazardous Goods	MW259	13/12/2023	0089_QC114_231213	Field Duplicate	EP2317700		285		285	6.83	7.37	30	3.76	14	98	17	3	23
and Waste Storage, Ship Sullage	MW259	13/12/2023	0089_QC214_231213	Interlab Duplicate	1053798													
Dredge Spoil / Careening Bay	MW268	12/12/2023	0089_MW268_231212	Normal	EP2317627		436		436	105	105	2,920	0.10	659	201	255	87	1,650
Dredge Spoil / Careening Bay	MW269	12/12/2023	0089_MW269_231212	Normal	EP2317627		464		464	16.9	16.1	239	2.58	44	80	59	14	158
HSF	MW282	13/12/2023	0089_MW282_231213	Normal	EP2317849		462		462	11.6	13.2	62	6.42	30	185	25	10	38
Accomodation Area	MW288	13/12/2023	0089_MW288_231213	Normal	EP2317700		312		312	7.88	8.41	37	3.24	29	103	18	7	37
Accomodation Area	MW289	11/12/2023	0089_MW289_231211	Normal	EP2317575		378		378	10.8	10.9	64	0.44	69	101	30	8	73
AVCAT Storage and Fuel Farm	MW496	12/12/2023	0089_MW496_231212	Normal	EP2317627		389		389	14.0	13.7	162	0.83	78	78	40	13	143
FTA	MW500	12/12/2023	0089_MW500_231212	Normal	EP2317628		322		322	8.65	9.00	47	1.99	43	127	17	2	28
AVCAT Storage and Fuel Farm	MW516	12/12/2023	0089_MW516_231212	Normal	EP2317627		462		462	11.0	11.6	44	2.62	28	117	38	8	57
WWTP (East)	PW304	13/12/2023	0089_PW304_231213	Normal	EP2317701		288		288	201	185	6,310	4.31	846	156	439	131	3,160
HSF	PW306	11/12/2023	0089_PW306_231211	Normal	EP2317576		418		418	639	688	20,400	3.70	2,650	591	1,530	758	11,800
HSF	PW307	11/12/2023	0089_PW307_231211	Normal	EP2317576		91		91	615	707	19,600	6.98	2,900	548	1,620	627	12,200

						Inorganics									Metals			
						Carbonate Alkalinity (as CaCO3)	Alkalinity (Bicarbonate as CaCO3)	Alkalinity (Hydroxide) as CaCO3	Alkalinity (total) as CaCO3	Anions Total	Cations Total	Chloride	Ionic Balance	Sulphate as SO4 - Turbidimetric (filtered)	Calcium (filtered)	Magnesium (filtered)	Potassium (filtered)	Sodium (filtered)
						mg/L	mg/L	mg/L	mg/L	meq/L	meq/L	mg/L	%	mg/L	mg/L	mg/L	mg/L	mg/L
LOR - Limit of Reporting						1	1	1	1	0.01	0.01	1	0.01	1	1	1	1	1
PFAS NEMP 2020 Drinking Water																		
PFAS NEMP 2020 Freshwater 99%																		
PFAS NEMP 2020 Recreational Water																		
Monitoring Area	**Location Code**	**Date**	**Field ID**	**Sample Type**	**Lab Report Number**													
HSF	PW308	11/12/2023	0089_PW308_231211	Normal	EP2317576		80		80	621	691	19,800	5.35	2,920	526	1,600	611	11,900
HSF	PW314	11/12/2023	0089_PW314_231211	Normal	EP2317576		82		82	629	655	20,200	2.05	2,760	458	1,470	608	11,400
HSF	PW315	11/12/2023	0089_PW315_231211	Normal	EP2317576		88		88	623	666	20,000	3.32	2,750	465	1,490	610	11,600
HSF	PW316	11/12/2023	0089_PW316_231211	Normal	EP2317576		93		93	621	658	19,800	2.86	2,930	516	1,530	579	11,300
Demolition Ground	PW329	19/12/2023	0089_PW329_231219	Normal	EP2318014		146		146	678	686	21,700	0.60	3,020	478	1,520	592	12,000
Demolition Ground	PW330	19/12/2023	0089_PW330_231219	Normal	EP2318014		134		134	681	681	21,800	0.04	3,040	473	1,520	591	11,900
Demolition Ground	PW331	19/12/2023	0089_PW331_231219	Normal	EP2318014		155		155	632	728	20,100	7.06	2,980	521	1,660	682	12,600
FTA	PW335	11/12/2023	0089_PW335_231211	Normal	EP2317576		144		144	652	689	20,900	2.77	2,840	478	1,540	632	12,000
FTA	PW340	11/12/2023	0089_PW340_231211	Normal	EP2317576		142		142	672	787	21,500	7.91	2,990	546	1,760	740	13,700
FTA	PW341	11/12/2023	0089_PW341_231211	Normal	EP2317576		121		121	678	754	21,700	5.34	3,030	526	1,700	707	13,100
WWTP (East)	PW345	13/12/2023	0089_PW345_231213	Normal	EP2317690		524		524	757	839	24,000	5.18	3,320	682	1,840	734	14,600
Accomodation Area	PW346	13/12/2023	0089_PW346_231213	Normal	EP2317701		252		252	49.8	50.2	1,390	0.36	267	57	130	66	803
WWTP (West)	PW350	14/12/2023	0089_PW350_231214	Normal	EP2317756		133		133	569	636	18,100	5.56	2,700	456	1,460	592	11,000
WWTP (West)	PW351	14/12/2023	0089_PW351_231214	Normal	EP2317756		127		127	549	631	17,500	6.94	2,540	451	1,450	585	10,900
WWTP (West)	PW352	14/12/2023	0089_PW352_231214	Normal	EP2317756		139		139	564	653	18,000	7.26	2,590	465	1,490	605	11,300
Demolition Ground	PW356	19/12/2023	0089_PW356_231219	Normal	EP2318014		188		188	668	768	21,400	7.00	2,900	546	1,750	726	13,300
Demolition Ground	PW357	19/12/2023	0089_PW357_231219	Normal	EP2318014		164		164	723	715	23,200	0.55	3,150	501	1,590	619	12,500
Demolition Ground	PW358	19/12/2023	0089_PW358_231219	Normal	EP2318014		182		182	718	721	23,100	0.17	3,020	517	1,590	621	12,600
FTA	PW362	11/12/2023	0089_PW362_231211	Normal	EP2317576		120		120	681	759	21,800	5.43	3,060	525	1,710	710	13,200
FTA	PW363	11/12/2023	0089_PW363_231211	Normal	EP2317576		144		144	687	741	22,000	3.80	3,040	511	1,660	698	12,900
FTA	PW364	11/12/2023	0089_PW364_231211	Normal	EP2317576		130		130	655	690	21,000	2.59	2,880	478	1,550	638	12,000
FTA	PW364	11/12/2023	0089_QC106_231211	Field Duplicate	EP2317576		653		653	672	690	21,200	1.36	2,910	485	1,550	641	12,000
FTA	PW364	11/12/2023	0089_QC206_231211	Interlab Duplicate	1053798													
WWTP (East)	PW367	13/12/2023	0089_PW367_231213	Normal	EP2317690		861		861	707	679	22,500	2.01	2,650	578	1,470	460	11,900
WWTP (East)	PW367	13/12/2023	0089_QC115_231213	Field Duplicate	EP2317690													
WWTP (East)	PW367	13/12/2023	0089_QC215_231213	Interlab Duplicate	1053798													
WWTP (East)	PW368	13/12/2023	0089_PW368_231213	Normal	EP2317701		441		441	732	670	23,400	4.46	3,030	508	1,450	452	11,800
WWTP (East)	PW369	13/12/2023	0089_PW369_231213	Normal	EP2317690		384		384	748	760	23,800	0.78	3,300	522	1,680	654	13,300
Dredge Spoil / Careening Bay	PW374	12/12/2023	0089_PW374_231212	Normal	EP2317629		177		177	630	638	20,200	0.65	2,720	439	1,400	547	11,200
Dredge Spoil / Careening Bay	PW375	12/12/2023	0089_PW375_231212	Normal	EP2317629		131		131	666	660	21,200	0.44	3,130	449	1,440	565	11,600
Dredge Spoil / Careening Bay	PW378	12/12/2023	0089_PW378_231212	Normal	EP2317629		140		140	660	666	21,200	0.40	2,850	455	1,450	569	11,700
Dredge Spoil / Careening Bay	PW378	12/12/2023	0089_QC110_231212	Field Duplicate	EP2317629		142		142	661	649	21,200	0.93	2,910	444	1,420	560	11,400
Dredge Spoil / Careening Bay	PW378	12/12/2023	0089_QC210_231213	Interlab Duplicate	1053798													
WWTP (West)	PW380	14/12/2023	0089_PW380_231214	Normal	EP2317756		130		130	570	636	18,200	5.39	2,620	453	1,450	592	11,000
WWTP (West)	PW381	14/12/2023	0089_PW381_231214	Normal	EP2317756		136		136	553	647	17,500	7.87	2,720	464	1,480	599	11,200
WWTP (West)	PW401	14/12/2023	0089_PW401_231214	Normal	EP2317756		132		132	562	626	17,900	5.34	2,620	448	1,440	584	10,800
HSF	PW405	11/12/2023	0089_PW405_231211	Normal	EP2317554		116		116	685	728	22,000	3.06	2,990	491	1,590	637	12,800
HSF	PW405	11/12/2023	0089_QC103_231211	Field Duplicate	EP2317554		117		117	682	723	21,900	2.90	2,990	490	1,580	636	12,700
HSF	PW405	11/12/2023	0089_QC203_231211	Interlab Duplicate	1053798													
HSF	PW407	11/12/2023	0089_PW407_231211	Normal	EP2317554		106		106	714	736	22,900	1.49	3,170	495	1,620	650	12,900
HSF	PW409	11/12/2023	0089_PW409_231211	Normal	EP2317554		124		124	776	864	24,900	5.35	3,430	572	1,880	766	15,200
HSF	PW411	13/12/2023	0089_PW411_231213	Normal	EP2317850		127		127	628	651	20,000	1.81	2,950	452	1,440	562	11,400
HSF	PW413	13/12/2023	0089_PW413_231213	Normal	EP2317850		132		132	619	663	19,900	3.44	2,650	481	1,460	570	11,600
HSF	PW415	13/12/2023	0089_PW415_231213	Normal	EP2317850		133		133	628	658	20,000	2.37	2,920	463	1,460	571	11,500
FTA	SW130	11/12/2023	0089_SW130_231211	Normal	EP2317576		132		132	632	695	20,300	4.74	2,740	485	1,560	638	12,100
FTA	SW132	11/12/2023	0089_QC107_231211	Field Duplicate	EP2317576		127		127	630	667	20,200	2.88	2,760	469	1,500	615	11,600
FTA	SW132	11/12/2023	0089_QC207_231211	Interlab Duplicate	1053798													
FTA	SW132	11/12/2023	0089_SW132_231211	Normal	EP2317576		258		258	628	667	20,100	2.98	2,710	468	1,500	618	11,600
FTA	SW134	11/12/2023	0089_SW134_231211	Normal	EP2317576		126		126	637	707	20,400	5.26	2,820	492	1,590	662	12,300
Demolition Ground	SW150	19/12/2023	0089_SW150_231219	Normal	EP2318014		126		126	668	675	21,400	0.48	2,980	464	1,500	581	11,800
Demolition Ground	SW152	19/12/2023	0089_SW152_231219	Normal	EP2318014		126		126	682	680	21,900	0.14	2,970	467	1,510	589	11,900
Demolition Ground	SW154	19/12/2023	0089_SW154_231219	Normal	EP2318014		126		126	550	630	17,500	6.77	2,590	452	1,440	580	10,900
Demolition Ground	SW156	19/12/2023	0089_SW156_231219	Normal	EP2318014		126		126	670	687	21,500	1.20	2,950	474	1,530	594	12,000
WWTP (East)	SW305	13/12/2023	0089_SW305_231213	Normal	EP2317701		146		146	625	577	20,000	3.99	2,780	425	1,240	394	10,200
HSF	SW309	11/12/2023	0089_SW309_231211	Normal	EP2317576		83		83	628	662	20,200	2.61	2,730	468	1,490	617	11,500
HSF	SW310	11/12/2023	0089_SW310_231211	Normal	EP2317576		84		84	625	668	20,100	3.30	2,700	462	1,500	643	11,600
HSF	SW311	11/12/2023	0089_SW311_231211	Normal	EP2317576		84		84	618	696	19,700	5.97	2,900	538	1,600	617	12,000
Dredge Spoil / Careening Bay	SW317	12/12/2023	0089_QC109_231212	Field Duplicate	EP2317629		130		130	642	644	20,600	0.18	2,780	445	1,410	550	11,300
Dredge Spoil / Careening Bay	SW317	12/12/2023	0089_QC209_231212	Interlab Duplicate	1053798													
Dredge Spoil / Careening Bay	SW317	12/12/2023	0089_SW317_231212	Normal	EP2317629		131		131	638	649	20,500	0.82	2,770	444	1,420	556	11,400
Dredge Spoil / Careening Bay	SW318	12/12/2023	0089_SW318_231212	Normal	EP2317629		130		130	641	672	20,600	2.34	2,770	464	1,470	573	11,800
Dredge Spoil / Careening Bay	SW319	12/12/2023	0089_SW319_231212	Normal	EP2317629		129		129	644	654	20,700	0.78	2,780	446	1,430	559	11,500
WWTP (West)	SW353	14/12/2023	0089_SW353_231214	Normal	EP2317756		129		129	574	636	18,300	5.13	2,660	452	1,460	589	11,000
WWTP (East)	SW370	13/12/2023	0089_SW370_231213	Normal	EP2317690		122		122	648	634	20,700	1.05	2,940	468	1,370	423	11,200
WWTP (East)	SW371	13/12/2023	0089_SW371_231213	Normal	EP2317701		155		155	610	584	19,500	2.19	2,730	441	1,260	396	10,300
WWTP (East)	SW372	13/12/2023	0089_SW372_231213	Normal	EP2317701		155		155	598	566	19,100	2.74	2,690	428	1,240	381	9,950
WWTP (West)	SW373	13/12/2023	0089_SW373_231213	Normal	EP2317701		142		142	623	585	19,900	3.12	2,820	420	1,290	394	10,300
WWTP (West)	SW382	14/12/2023	0089_SW382_231214	Normal	EP2317756		127		127	541	630	17,200	7.64	2,540	450	1,440	583	10,900
WWTP (West)	SW383	14/12/2023	0089_SW383_231214	Normal	EP2317756		129		129	559	630	17,900	5.98	2,470	450	1,440	583	10,900
WWTP (West)	SW384	14/12/2023	0089_SW384_231214	Normal	EP2317756		130		130	535	624	17,000	7.70	2,550	446	1,430	581	10,800
HSF	SW406	11/12/2023	0089_QC104_231211	Field Duplicate	EP2317554		148		148	683	718	21,900	2.48	3,000	493	1,570	631	12,600
HSF	SW406	11/12/2023	0089_QC204_231211	Interlab Duplicate	1053798													
HSF	SW406	11/12/2023	0089_SW406_231211	Normal	EP2317554		147		147	675	706	21,700	2.29	2,860	485	1,540	621	12,400
HSF	SW408	11/12/2023	0089_SW408_231211	Normal	EP2317554		136		136	670	729	21,500	4.24	2,910	503	1,590	642	12,800
HSF	SW410	11/12/2023	0089_SW410_231211	Normal	EP2317554		662		662	504	518	15,700	1.44	2,280	420	1,150	524	8,950
HSF	SW412	13/12/2023	0089_SW412_231213	Normal	EP2317850		136		136	631	662	20,100	2.39	2,960	458	1,460	575	11,600
HSF	SW414	13/12/2023	0089_SW414_231213	Normal	EP2317850		124		124	637	658	20,300	1.62	2,960	457	1,460	570	11,500
HSF	SW416	13/12/2023	0089_SW416_231213	Normal	EP2317850		115		115	637	663	20,300	2.04	2,970	458	1,470	580	11,600

Environmental Standards
HEPA, January 2020, PFAS NEMP 2020 Drinking Water
HEPA, January 2020, PFAS NEMP 2020 Freshwater 99%
HEPA, January 2020, PFAS NEMP 2020 Recreational Water
Env Stds Comments
*Practical screening guideline of 0.01 µg/L adopted base on typical current laboratory limit of reporting.
Notes:
First time detection of PFOA or PFOS/PFHxS
New exceedance of guideline value

							PFAS - Perfluoroalkyl Sulfonic Acids						PFAS - Perfluoroalkyl Carboxylic Acids							
							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)
							mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
LOR - Limit of Reporting							0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.001	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002
Monitoring Area	**Location Code**	**Date**	**Field ID**	**Sample Type**	**Lab Report Number**															
WWTP	SD304	13/12/2023	0089_SD304_231213	Normal	EP2317702															
HSF	SD306	11/12/2023	0089_SD306_231211	Normal	EP2317577															
HSF	SD307	11/12/2023	0089_SD307_231211	Normal	EP2317577															
HSF	SD308	11/12/2023	0089_SD308_231211	Normal	EP2317577															
HSF	SD314	11/12/2023	0089_SD314_231211	Normal	EP2317577															
HSF	SD315	11/12/2023	0089_SD315_231211	Normal	EP2317577															
HSF	SD316	11/12/2023	0089_SD316_231211	Normal	EP2317577															
Demolition ground	SD329	19/12/2023	0089_SD329_231219	Normal	EP2318016															
Demolition ground	SD330	19/12/2023	0089_SD330_231219	Normal	EP2318016															
Demolition ground	SD331	19/12/2023	0089_SD331_231219	Normal	EP2318016															
FTA	SD335	11/12/2023	0089_QC101_231211	Field Duplicate	EP2317577															
FTA	SD335	11/12/2023	0089_QC201_231211	Interlab Duplicate	1053798															
FTA	SD335	11/12/2023	0089_SD335_231211	Normal	EP2317577															
FTA	SD340	11/12/2023	0089_SD340_231211	Normal	EP2317577															
FTA	SD341	11/12/2023	0089_SD341_231211	Normal	EP2317577															
WWTP	SD345	13/12/2023	0089_SD345_231213	Normal	EP2317691						0.0002									
Accomodation Area	SD346	13/12/2023	0089_SD346_231213	Normal	EP2317702						0.0040									
WWTP	SD350	14/12/2023	0089_SD350_231214	Normal	EP2317755															
WWTP	SD351	14/12/2023	0089_SD351_231214	Normal	EP2317755															
WWTP	SD352	14/12/2023	0089_SD352_231214	Normal	EP2317755															
Demolition ground	SD356	19/12/2023	0089_SD356_231219	Normal	EP2318016															
Demolition ground	SD357	19/12/2023	0089_SD357_231219	Normal	EP2318016															
Demolition ground	SD358	19/12/2023	0089_SD358_231219	Normal	EP2318016															
FTA	SD362	11/12/2023	0089_SD362_231211	Normal	EP2317577															
FTA	SD363	11/12/2023	0089_SD363_231211	Normal	EP2317577						0.0002									
FTA	SD364	11/12/2023	0089_SD364_231211	Normal	EP2317577															
WWTP	SD367	13/12/2023	0089_QC116_231213	Field Duplicate	EP2317691						0.0003									
WWTP	SD367	13/12/2023	0089_QC216_231213	Interlab Duplicate	1053798															
WWTP	SD367	13/12/2023	0089_SD367_231213	Normal	EP2317691						0.0003									
WWTP	SD368	13/12/2023	0089_SD368_231213	Normal	EP2317702															
WWTP	SD369	13/12/2023	0089_SD369_231213	Normal	EP2317691															
Dredge spoil and careening bay	SD374	12/12/2023	0089_SD374_231212	Normal	EP2317630															
Dredge spoil and careening bay	SD375	12/12/2023	0089_SD375_231212	Normal	EP2317630															
Dredge spoil and careening bay	SD378	12/12/2023	0089_QC111_231212	Field Duplicate	EP2317630															
Dredge spoil and careening bay	SD378	12/12/2023	0089_QC211_231212	Interlab Duplicate	1053798															
Dredge spoil and careening bay	SD378	12/12/2023	0089_SD378_231212	Normal	EP2317630															
WWTP	SD380	14/12/2023	0089_SD380_231214	Normal	EP2317755															
WWTP	SD381	14/12/2023	0089_SD381_231214	Normal	EP2317755															
WWTP	SD401	14/12/2023	0089_SD401_231214	Normal	EP2317755															
HSF	SD405	11/12/2023	0089_QC105_231211	Field Duplicate	EP2317556															
HSF	SD405	11/12/2023	0089_QC205_231211	Interlab Duplicate	1053798															
HSF	SD405	11/12/2023	0089_SD405_231211	Normal	EP2317556															
HSF	SD407	11/12/2023	0089_SD407_231211	Normal	EP2317556															
HSF	SD409	11/12/2023	0089_SD409_231211	Normal	EP2317556															
HSF	SD411	13/12/2023	0089_SD411_231213	Normal	EP2317693															
HSF	SD413	13/12/2023	0089_SD413_231213	Normal	EP2317693															
HSF	SD415	13/12/2023	0089_SD415_231213	Normal	EP2317693															

Notes:

First-time detection of PFOA or PFOS+PFHxS

						PFAS - (n:2) Fluorotelomer Sulfonic Acids				PFAS - Perfluoroalkyl Sulfonamides							PFAS		
					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 (WA DER List)	Sum of PFAS
					mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
LOR - Limit of Reporting					0.0002	0.0002	0.0005	0.0005	0.0005	0.0005	0.0005	0.0002	0.0005	0.0002	0.0005	0.0005	0.0002	0.0005	0.0002	0.0002	0.0002
Monitoring Area	Location Code	Date	Field ID	Sample Type	Lab Report Number																
WWTP	SD304	13/12/2023	0089_SD304_231213	Normal	EP2317702																
HSF	SD306	11/12/2023	0089_SD306_231211	Normal	EP2317577																
HSF	SD307	11/12/2023	0089_SD307_231211	Normal	EP2317577																
HSF	SD308	11/12/2023	0089_SD308_231211	Normal	EP2317577																
HSF	SD314	11/12/2023	0089_SD314_231211	Normal	EP2317577																
HSF	SD315	11/12/2023	0089_SD315_231211	Normal	EP2317577																
HSF	SD316	11/12/2023	0089_SD316_231211	Normal	EP2317577																
Demolition ground	SD329	19/12/2023	0089_SD329_231219	Normal	EP2318016																
Demolition ground	SD330	19/12/2023	0089_SD330_231219	Normal	EP2318016																
Demolition ground	SD331	19/12/2023	0089_SD331_231219	Normal	EP2318016																
FTA	SD335	11/12/2023	0089_QC101_231211	Field Duplicate	EP2317577																
FTA	SD335	11/12/2023	0089_QC201_231211	Interlab Duplicate	1053798																
FTA	SD335	11/12/2023	0089_SD335_231211	Normal	EP2317577																
FTA	SD340	11/12/2023	0089_SD340_231211	Normal	EP2317577																
FTA	SD341	11/12/2023	0089_SD341_231211	Normal	EP2317577																
WWTP	SD345	13/12/2023	0089_SD345_231213	Normal	EP2317691														0.0002	0.0002	0.0002
Accomodation Area	SD346	13/12/2023	0089_SD346_231213	Normal	EP2317702														0.0040	0.0040	0.0040
WWTP	SD350	14/12/2023	0089_SD350_231214	Normal	EP2317755																
WWTP	SD351	14/12/2023	0089_SD351_231214	Normal	EP2317755																
WWTP	SD352	14/12/2023	0089_SD352_231214	Normal	EP2317755																
Demolition ground	SD356	19/12/2023	0089_SD356_231219	Normal	EP2318016																
Demolition ground	SD357	19/12/2023	0089_SD357_231219	Normal	EP2318016																
Demolition ground	SD358	19/12/2023	0089_SD358_231219	Normal	EP2318016																
FTA	SD362	11/12/2023	0089_SD362_231211	Normal	EP2317577																
FTA	SD363	11/12/2023	0089_SD363_231211	Normal	EP2317577														0.0002	0.0002	0.0002
FTA	SD364	11/12/2023	0089_SD364_231211	Normal	EP2317577																
WWTP	SD367	13/12/2023	0089_QC116_231213	Field Duplicate	EP2317691														0.0003	0.0003	0.0003
WWTP	SD367	13/12/2023	0089_QC216_231213	Interlab Duplicate	1053798																
WWTP	SD367	13/12/2023	0089_SD367_231213	Normal	EP2317691														0.0003	0.0003	0.0003
WWTP	SD368	13/12/2023	0089_SD368_231213	Normal	EP2317702																
WWTP	SD369	13/12/2023	0089_SD369_231213	Normal	EP2317691																
Dredge spoil and careening bay	SD374	12/12/2023	0089_SD374_231212	Normal	EP2317630																
Dredge spoil and careening bay	SD375	12/12/2023	0089_SD375_231212	Normal	EP2317630																
Dredge spoil and careening bay	SD378	12/12/2023	0089_QC111_231212	Field Duplicate	EP2317630																
Dredge spoil and careening bay	SD378	12/12/2023	0089_QC211_231212	Interlab Duplicate	1053798																
Dredge spoil and careening bay	SD378	12/12/2023	0089_SD378_231212	Normal	EP2317630																
WWTP	SD380	14/12/2023	0089_SD380_231214	Normal	EP2317755																
WWTP	SD381	14/12/2023	0089_SD381_231214	Normal	EP2317755																
WWTP	SD401	14/12/2023	0089_SD401_231214	Normal	EP2317755																
HSF	SD405	11/12/2023	0089_QC105_231211	Field Duplicate	EP2317556																
HSF	SD405	11/12/2023	0089_QC205_231211	Interlab Duplicate	1053798																
HSF	SD405	11/12/2023	0089_SD405_231211	Normal	EP2317556																
HSF	SD407	11/12/2023	0089_SD407_231211	Normal	EP2317556																
HSF	SD409	11/12/2023	0089_SD409_231211	Normal	EP2317556																
HSF	SD411	13/12/2023	0089_SD411_231213	Normal	EP2317693																
HSF	SD413	13/12/2023	0089_SD413_231213	Normal	EP2317693																
HSF	SD415	13/12/2023	0089_SD415_231213	Normal	EP2317693																

Notes:
First-time detection of PFOA or PFOS+PFHxS

				PFAS - Perfluoroalkyl Sulfonic Acids						PFAS - Perfluoroalkyl Carboxylic Acids										
				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)
				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 - Limit of Reporting				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
Date	Field ID	Sample Type	Lab Report Number																	
11/12/2023	0089_QC301_231211	Rinsate	EP2317575																	
11/12/2023	0089_QC302_231211	Rinsate	EP2317575																	
11/12/2023	0089_QC401_231211	Field Blank	EP2317575																	
11/12/2023	0089_QC402_231211	Field Blank	EP2317575																	
12/12/2023	0089_QC301_231212	Rinsate	EP2317628																	
12/12/2023	0089_QC302_231212	Rinsate	EP2317628																	
12/12/2023	0089_QC401_231212	Field Blank	EP2317628																	
12/12/2023	0089_QC402_231212	Field Blank	EP2317628																	
13/12/2023	0089_QC301_231213	Rinsate	EP2317729																	
13/12/2023	0089_QC302_231213	Rinsate	EP2317729																	
13/12/2023	0089_QC303_231213	Rinsate	EP2317729																	
13/12/2023	0089_QC401_231213	Field Blank	EP2317729																	
13/12/2023	0089_QC402_231213	Field Blank	EP2317729																	
13/12/2023	0089_QC403_231213	Field Blank	EP2317729																	
14/12/2023	0089_QC301_231214	Rinsate	EP2317757																	
14/12/2023	0089_QC302_231214	Rinsate	EP2317757																	
14/12/2023	0089_QC401_231214	Field Blank	EP2317757																	
14/12/2023	0089_QC402_231214	Field Blank	EP2317757																	
19/12/2023	0089_QC301_231219	Rinsate	EP2318017																	
19/12/2023	0089_QC401_231219	Field Blank	EP2318017																	

				PFAS - (n:2) Fluorotelomer Sulfonic Acids				PFAS - Perfluoroalkyl Sulfonamides							PFAS		
				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 (WA DER List)	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
LOR - Limit of Reporting				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	0.01
Date	Field ID	Sample Type	Lab Report Number														
11/12/2023	0089_QC301_231211	Rinsate	EP2317575														
11/12/2023	0089_QC302_231211	Rinsate	EP2317575														
11/12/2023	0089_QC401_231211	Field Blank	EP2317575														
11/12/2023	0089_QC402_231211	Field Blank	EP2317575														
12/12/2023	0089_QC301_231212	Rinsate	EP2317628														
12/12/2023	0089_QC302_231212	Rinsate	EP2317628														
12/12/2023	0089_QC401_231212	Field Blank	EP2317628														
12/12/2023	0089_QC402_231212	Field Blank	EP2317628														
13/12/2023	0089_QC301_231213	Rinsate	EP2317729														
13/12/2023	0089_QC302_231213	Rinsate	EP2317729														
13/12/2023	0089_QC303_231213	Rinsate	EP2317729														
13/12/2023	0089_QC401_231213	Field Blank	EP2317729														
13/12/2023	0089_QC402_231213	Field Blank	EP2317729														
13/12/2023	0089_QC403_231213	Field Blank	EP2317729														
14/12/2023	0089_QC301_231214	Rinsate	EP2317757														
14/12/2023	0089_QC302_231214	Rinsate	EP2317757														
14/12/2023	0089_QC401_231214	Field Blank	EP2317757														
14/12/2023	0089_QC402_231214	Field Blank	EP2317757														
19/12/2023	0089_QC301_231219	Rinsate	EP2318017														
19/12/2023	0089_QC401_231219	Field Blank	EP2318017														

			Date	11 Dec 2023	11 Dec 2023		11 Dec 2023	11 Dec 2023		11 Dec 2023	11 Dec 2023		11 Dec 2023	11 Dec 2023		11 Dec 2023	11 Dec 2023	
			Field ID	0089_MW228_231211	0089_QC102_231211		0089_MW228_231211	0089_QC202_231211		0089_PW405_231211	0089_QC103_231211		0089_PW405_231211	0089_QC203_231211		0089_SW406_231211	0089_QC104_231211	
			Matrix Type	Water	Water		Water	Water		Water	Water		Water	Water		Water	Water	
			Lab Report Number	EP2317555	EP2317555	RPD	EP2317555	1053798	RPD	EP2317554	EP2317554	RPD	EP2317554	1053798	RPD	EP2317554	EP2317554	RPD
	Unit	LOR																
PFAS - Perfluoroalkyl Sulfonic Acids																		
Perfluorobutane sulfonic acid (PFBS)	µg/L	0.01	0.25	0.28	11	0.25	0.29	15			0			0				0
Perfluoropentane sulfonic acid (PFPeS)	µg/L	0.01	0.21	0.21	0	0.21	0.35	50			0			0				0
Perfluorohexane sulfonic acid (PFHxS)	µg/L	0.01	0.49	0.56	13	0.49	0.75	42			0			0				0
Perfluoroheptane sulfonic acid (PFHpS)	µg/L	0.01			0			0			0			0				0
Perfluorooctane sulfonic acid (PFOS)	µg/L	0.01			0			0			0			0	0.01	0.01		0
Perfluorononanesulfonic acid (PFNS)	µg/L	0.01																
Perfluorodecane sulfonic acid (PFDS)	µg/L	0.01			0			0			0			0				0
PFAS - Perfluoroalkyl Carboxylic Acids																		
Perfluorobutanoic acid (PFBA)	µg/L	0.05	1.2	1.1	9	1.2	1.4	15			0			0				0
Perfluoropentanoic acid (PFPeA)	µg/L	0.01	4.23	3.56	17	4.23	4.7	11			0			0	0.04	0.04		0
Perfluorohexanoic acid (PFHxA)	µg/L	0.01	5.03	4.67	7	5.03	4.8	5			0			0	0.07	0.07		0
Perfluoroheptanoic acid (PFHpA)	µg/L	0.01	1.07	1.19	11	1.07	1.3	19			0			0				0
Perfluorooctanoic acid (PFOA)	µg/L	0.01	0.32	0.29	10	0.32	0.40	22			0			0				0
Perfluorononanoic acid (PFNA)	µg/L	0.01			0			0			0			0				0
Perfluorodecanoic acid (PFDA)	µg/L	0.01			0			0			0			0				0
Perfluoroundecanoic acid (PFUnDA)	µg/L	0.01			0			0			0			0				0
Perfluorododecanoic acid (PFDoDA)	µg/L	0.01			0			0			0			0				0
Perfluorotridecanoic acid (PFTrDA)	µg/L	0.01			0			0			0			0				0
Perfluorotetradecanoic acid (PFTeDA)	µg/L	0.01			0			0			0			0				0
PFAS - (n:2) Fluorotelomer Sulfonic Acids																		
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	µg/L	0.01			0			0			0			0				0
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	µg/L	0.05	1.02	0.85	18	1.02	0.78	27			0			0				0
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	µg/L	0.01			0			0			0			0				0
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	µg/L	0.01			0			0			0			0				0
PFAS - Perfluoroalkyl Sulfonamides																		
Perfluorooctane sulfonamide (FOSA)	µg/L	0.02			0			0			0			0				0
N-Methyl perfluorooctane sulfonamide (MeFOSA)	µg/L	0.05			0			0			0			0				0
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	µg/L	0.02			0			0			0			0				0
N-methyl perfluorooctane sulfonamidoethanol (MeFOSE)	µg/L	0.05			0			0			0			0				0
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	µg/L	0.05			0			0			0			0				0
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	µg/L	0.02			0			0			0			0				0
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	µg/L	0.05			0			0			0			0				0
PFAS																		
Sum of PFHxS and PFOS	µg/L	0.01	0.49	0.56	13	0.49	0.75	42			0			0	0.01	0.01		0
Sum of PFAS (WA DER List)	µg/L	0.01	13.6	12.5	8	13.6	14.42	6			0			0	0.12	0.12		0
Sum of PFAS	µg/L	0.01	13.8	12.7	8	13.8	14.9	8			0			0	0.12	0.12		0

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

			Date	11 Dec 2023	11 Dec 2023		11 Dec 2023	11 Dec 2023		11 Dec 2023	11 Dec 2023		11 Dec 2023	11 Dec 2023		11 Dec 2023	11 Dec 2023		12 Dec 2023	12 Dec 2023	
			Field ID	0089_SW406_231211	0089_QC204_231211		0089_PW364_231211	0089_QC106_231211		0089_PW364_231211	0089_QC206_231211		0089_SW132_231211	0089_QC107_231211		0089_SW132_231211	0089_QC207_231211		0089_MW123_231212	0089_QC108_231212	
			Matrix Type	Water	Water		Water	Water		Water	Water		Water	Water		Water	Water		Water	Water	
			Lab Report Number	EP2317554	1053798	RPD	EP2317576	EP2317576	RPD	EP2317576	1053798	RPD	EP2317576	EP2317576	RPD	EP2317576	1053798	RPD	EP2317628	EP2317628	RPD
	Unit	LOR																			
PFAS - Perfluoroalkyl Sulfonic Acids																					
Perfluorobutane sulfonic acid (PFBS)	µg/L	0.01			0			0			0				0			0	0.50	0.53	6
Perfluoropentane sulfonic acid (PFPeS)	µg/L	0.01			0			0			0				0			0	1.83	1.75	7
Perfluorohexane sulfonic acid (PFHxS)	µg/L	0.01			0			0			0	0.01	0.01	0	0.01	0.02	67	19.0	18.3	4
Perfluoroheptane sulfonic acid (PFHpS)	µg/L	0.01			0			0			0				0			0	0.91	1.05	14
Perfluorooctane sulfonic acid (PFOS)	µg/L	0.01	0.01		0	0.01	0.01	0	0.01	0.01	0	0.10	0.06	50	0.10	0.03	108	36.9	40.0	8
Perfluorononanesulfonic acid (PFNS)	µg/L	0.01																			
Perfluorodecane sulfonic acid (PFDS)	µg/L	0.01			0			0			0				0			0			0
PFAS - Perfluoroalkyl Carboxylic Acids																					
Perfluorobutanoic acid (PFBA)	µg/L	0.05			0			0			0				0			0	0.1	0.1	0
Perfluoropentanoic acid (PFPeA)	µg/L	0.01	0.04	0.02	67			0			0				0			0	0.27	0.29	7
Perfluorohexanoic acid (PFHxA)	µg/L	0.01	0.07	0.05	33			0			0				0			0	1.91	1.94	2
Perfluoroheptanoic acid (PFHpA)	µg/L	0.01			0			0			0				0	0.05	86	0.26	0.27	4
Perfluorooctanoic acid (PFOA)	µg/L	0.01			0			0			0				0			0	1.81	1.73	7
Perfluorononanoic acid (PFNA)	µg/L	0.01			0			0			0				0			0			0
Perfluorodecanoic acid (PFDA)	µg/L	0.01			0			0			0				0			0			0
Perfluoroundecanoic acid (PFUnDA)	µg/L	0.01			0			0			0				0			0			0
Perfluorododecanoic acid (PFDoDA)	µg/L	0.01			0			0			0				0			0			0
Perfluorotridecanoic acid (PFTrDA)	µg/L	0.01			0			0			0				0			0			0
Perfluorotetradecanoic acid (PFTeDA)	µg/L	0.01			0			0			0				0			0			0
PFAS - (n:2) Fluorotelomer Sulfonic Acids																					
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	µg/L	0.01			0			0			0				0			0			0
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	µg/L	0.05			0			0			0				0			0			0
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	µg/L	0.01			0			0			0				0			0			0
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	µg/L	0.01			0			0			0				0			0			0
PFAS - Perfluoroalkyl Sulfonamides																					
Perfluorooctane sulfonamide (FOSA)	µg/L	0.02			0			0			0				0			0	0.10	0.11	10
N-Methyl perfluorooctane sulfonamide (MeFOSA)	µg/L	0.05			0			0			0				0			0			0
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	µg/L	0.02			0			0			0				0			0			0
N-methyl perfluorooctane sulfonamidoethanol (MeFOSE)	µg/L	0.05			0			0			0				0			0			0
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	µg/L	0.05			0			0			0				0			0			0
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	µg/L	0.02			0			0			0				0			0			0
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	µg/L	0.05			0			0			0				0			0			0
PFAS																					
Sum of PFHxS and PFOS	µg/L	0.01	0.01		0	0.01	0.01	0	0.01	0.01	0	0.11	0.07	44	0.11	0.05	75	55.9	58.3	4
Sum of PFAS (WA DER List)	µg/L	0.01	0.12	0.07	53	0.01	0.01	0	0.01		0	0.11	0.07	44	0.11	0.1	10	60.6	63.2	4
Sum of PFAS	µg/L	0.01	0.12		18	0.01	0.01	0	0.01		0	0.11	0.07	44	0.11	0.1	10	63.2	66.1	4

			Date	12 Dec 2023	12 Dec 2023		12 Dec 2023	12 Dec 2023		12 Dec 2023	12 Dec 2023		12 Dec 2023	12 Dec 2023		12 Dec 2023	12 Dec 2023		12 Dec 2023	12 Dec 2023	
			Field ID	0089_MW123_231212	0089_QC208_231212		0089_SW317_231212	0089_QC109_231212		0089_SW317_231212	0089_QC209_231212		0089_PW378_231212	0089_QC110_231212		0089_PW378_231212	0089_QC210_231213		0089_MW120_231212	0089_QC112_231212	
			Matrix Type	Water	Water		Water	Water		Water	Water		Water	Water		Water	Water		Water	Water	
			Lab Report Number	EP2317628	1053798		EP2317629	EP2317629		EP2317629	1053798		EP2317629	EP2317629		EP2317629	1053798		EP2317628	EP2317628	
	Unit	LOR				RPD			RPD			RPD			RPD			RPD			RPD
PFAS - Perfluoroalkyl Sulfonic Acids																					
Perfluorobutane sulfonic acid (PFBS)	µg/L	0.01	0.50	0.47	6	[redacted]	[redacted]	0	[redacted]	[redacted]	0	[redacted]	[redacted]	0	[redacted]	[redacted]	0	0.02	[redacted]	0
Perfluoropentane sulfonic acid (PFPeS)	µg/L	0.01	1.63	1.3	23	[redacted]	[redacted]	0	[redacted]	[redacted]	0	[redacted]	[redacted]	0	[redacted]	[redacted]	0	0.04	0.04	0
Perfluorohexane sulfonic acid (PFHxS)	µg/L	0.01	19.0	17	11	[redacted]	[redacted]	0	[redacted]	[redacted]	0	[redacted]	[redacted]	0	[redacted]	[redacted]	0	1.62	1.53	6
Perfluoroheptane sulfonic acid (PFHpS)	µg/L	0.01	0.91	0.94	3	[redacted]	[redacted]	0	[redacted]	[redacted]	0	[redacted]	[redacted]	0	[redacted]	[redacted]	0	0.23	0.22	4
Perfluorooctane sulfonic acid (PFOS)	µg/L	0.01	36.9	30	21	0.02	[redacted]	67	0.02	0.02	0	0.02	[redacted]	67	0.02	[redacted]	67	0.46	0.48	4
Perfluorononanesulfonic acid (PFNS)	µg/L	0.01		0.06																
Perfluorodecane sulfonic acid (PFDS)	µg/L	0.01	[redacted]	[redacted]	0	[redacted]	[redacted]	0	[redacted]	[redacted]	0	[redacted]	[redacted]	0	[redacted]	[redacted]	0	[redacted]	[redacted]	0
PFAS - Perfluoroalkyl Carboxylic Acids																					
Perfluorobutanoic acid (PFBA)	µg/L	0.05	0.1	0.10	0	[redacted]	[redacted]	0	[redacted]	[redacted]	0	[redacted]	[redacted]	0	[redacted]	[redacted]	0	[redacted]	[redacted]	0
Perfluoropentanoic acid (PFPeA)	µg/L	0.01	0.27	0.22	20	[redacted]	[redacted]	0	[redacted]	[redacted]	0	[redacted]	[redacted]	0	[redacted]	[redacted]	0	[redacted]	[redacted]	0
Perfluorohexanoic acid (PFHxA)	µg/L	0.01	1.91	2.3	19	[redacted]	[redacted]	0	[redacted]	[redacted]	0	[redacted]	[redacted]	0	[redacted]	[redacted]	0	0.06	0.06	0
Perfluoroheptanoic acid (PFHpA)	µg/L	0.01	0.26	0.24	8	[redacted]	[redacted]	0	[redacted]	[redacted]	0	[redacted]	[redacted]	0	[redacted]	[redacted]	0	[redacted]	[redacted]	0
Perfluorooctanoic acid (PFOA)	µg/L	0.01	1.61	0.42	117	[redacted]	[redacted]	0	[redacted]	[redacted]	0	[redacted]	[redacted]	0	[redacted]	[redacted]	0	0.10	0.08	22
Perfluorononanoic acid (PFNA)	µg/L	0.01	[redacted]	0.01	0	[redacted]	[redacted]	0	[redacted]	[redacted]	0	[redacted]	[redacted]	0	[redacted]	[redacted]	0	[redacted]	[redacted]	0
Perfluorodecanoic acid (PFDA)	µg/L	0.01	[redacted]	[redacted]	0	[redacted]	[redacted]	0	[redacted]	[redacted]	0	[redacted]	[redacted]	0	[redacted]	[redacted]	0	[redacted]	[redacted]	0
Perfluoroundecanoic acid (PFUnDA)	µg/L	0.01	[redacted]	[redacted]	0	[redacted]	[redacted]	0	[redacted]	[redacted]	0	[redacted]	[redacted]	0	[redacted]	[redacted]	0	[redacted]	[redacted]	0
Perfluorododecanoic acid (PFDoDA)	µg/L	0.01	[redacted]	[redacted]	0	[redacted]	[redacted]	0	[redacted]	[redacted]	0	[redacted]	[redacted]	0	[redacted]	[redacted]	0	[redacted]	[redacted]	0
Perfluorotridecanoic acid (PFTrDA)	µg/L	0.01	[redacted]	[redacted]	0	[redacted]	[redacted]	0	[redacted]	[redacted]	0	[redacted]	[redacted]	0	[redacted]	[redacted]	0	[redacted]	[redacted]	0
Perfluorotetradecanoic acid (PFTeDA)	µg/L	0.01	[redacted]	[redacted]	0	[redacted]	[redacted]	0	[redacted]	[redacted]	0	[redacted]	[redacted]	0	[redacted]	[redacted]	0	[redacted]	[redacted]	0
PFAS - (n:2) Fluorotelomer Sulfonic Acids																					
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	µg/L	0.01	[redacted]	[redacted]	0	[redacted]	[redacted]	0	[redacted]	[redacted]	0	[redacted]	[redacted]	0	[redacted]	[redacted]	0	[redacted]	[redacted]	0
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	µg/L	0.05	[redacted]	[redacted]	0	[redacted]	[redacted]	0	[redacted]	[redacted]	0	[redacted]	[redacted]	0	[redacted]	[redacted]	0	[redacted]	[redacted]	0
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	µg/L	0.01	[redacted]	[redacted]	0	[redacted]	[redacted]	0	[redacted]	[redacted]	0	[redacted]	[redacted]	0	[redacted]	[redacted]	0	[redacted]	[redacted]	0
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	µg/L	0.01	[redacted]	[redacted]	0	[redacted]	[redacted]	0	[redacted]	[redacted]	0	[redacted]	[redacted]	0	[redacted]	[redacted]	0	[redacted]	[redacted]	0
PFAS - Perfluoroalkyl Sulfonamides																					
Perfluorooctane sulfonamide (FOSA)	µg/L	0.02	0.10	0.09	11	[redacted]	[redacted]	0	[redacted]	[redacted]	0	[redacted]	[redacted]	0	[redacted]	[redacted]	0	[redacted]	[redacted]	0
N-Methyl perfluorooctane sulfonamide (MeFOSA)	µg/L	0.05	[redacted]	[redacted]	0	[redacted]	[redacted]	0	[redacted]	[redacted]	0	[redacted]	[redacted]	0	[redacted]	[redacted]	0	[redacted]	[redacted]	0
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	µg/L	0.02	[redacted]	[redacted]	0	[redacted]	[redacted]	0	[redacted]	[redacted]	0	[redacted]	[redacted]	0	[redacted]	[redacted]	0	[redacted]	[redacted]	0
N-methyl perfluorooctane sulfonamidoethanol (MeFOSE)	µg/L	0.05	[redacted]	[redacted]	0	[redacted]	[redacted]	0	[redacted]	[redacted]	0	[redacted]	[redacted]	0	[redacted]	[redacted]	0	[redacted]	[redacted]	0
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	µg/L	0.05	[redacted]	[redacted]	0	[redacted]	[redacted]	0	[redacted]	[redacted]	0	[redacted]	[redacted]	0	[redacted]	[redacted]	0	[redacted]	[redacted]	0
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	µg/L	0.02	[redacted]	[redacted]	0	[redacted]	[redacted]	0	[redacted]	[redacted]	0	[redacted]	[redacted]	0	[redacted]	[redacted]	0	[redacted]	[redacted]	0
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	µg/L	0.05	[redacted]	[redacted]	0	[redacted]	[redacted]	0	[redacted]	[redacted]	0	[redacted]	[redacted]	0	[redacted]	[redacted]	0	[redacted]	[redacted]	0
PFAS																					
Sum of PFHxS and PFOS	µg/L	0.01	55.9	47	17	0.02	[redacted]	67	0.02	0.02	0	0.02	[redacted]	67	0.02	[redacted]	67	2.08	2.01	3
Sum of PFAS (WA DER List)	µg/L	0.01	60.6	50.75	18	0.02	[redacted]	67	0.02	[redacted]	0	0.02	[redacted]	67	0.02	[redacted]	0	2.26	2.15	5
Sum of PFAS	µg/L	0.01	63.2	53.31	17	0.02	[redacted]	67	0.02	[redacted]	0	0.02	[redacted]	67	0.02	[redacted]	0	2.53	2.41	5

			Date	12 Dec 2023	12 Dec 2023		12 Dec 2023	12 Dec 2023		12 Dec 2023	12 Dec 2023		13 Dec 2023	13 Dec 2023		13 Dec 2023	13 Dec 2023		13 Dec 2023	13 Dec 2023	
			Field ID	0089_MW120_231212	0089_QC212_231212		0089_MW112_231212	0089_QC113_231212		0089_MW112_231212	0089_QC213_231212		0089_MW259_231213	0089_QC114_231213		0089_MW259_231213	0089_QC214_231213		0089_PW367_231213	0089_QC115_231213	
			Matrix Type	Water	Water		Water	Water		Water	Water		Water	Water		Water	Water		Water	Water	
			Lab Report Number	EP2317628	1053798	RPD	EP2317628	EP2317628	RPD	EP2317628	1053798	RPD	EP2317700	EP2317700	RPD	EP2317700	1053798	RPD	EP2317690	EP2317690	RPD
	Unit	LOR																			
PFAS - Perfluoroalkyl Sulfonic Acids																					
Perfluorobutane sulfonic acid (PFBS)	µg/L	0.01	0.02	0.01	67	0.04	0.05	22	0.04	0.04	0	[illegible]	[illegible]	0	[illegible]	[illegible]	0	[illegible]	[illegible]	0
Perfluoropentane sulfonic acid (PFPeS)	µg/L	0.01	0.04	0.06	40	0.11	0.12	9	0.11	0.06	59	[illegible]	[illegible]	0	[illegible]	[illegible]	0	[illegible]	[illegible]	0
Perfluorohexane sulfonic acid (PFHxS)	µg/L	0.01	1.62	1.5	8	4.53	4.51	0	4.53	2.9	44	0.05	0.05	0	0.05	0.05	0	[illegible]	[illegible]	0
Perfluoroheptane sulfonic acid (PFHpS)	µg/L	0.01	0.23	0.20	14	0.40	0.40	0	0.40	0.30	29	[illegible]	[illegible]	0	[illegible]	[illegible]	0	[illegible]	[illegible]	0
Perfluorooctane sulfonic acid (PFOS)	µg/L	0.01	0.46	0.51	10	27.1	27.3	1	27.1	16	51	0.06	0.06	0	0.06	0.07	15	0.02	0.02	0
Perfluorononanesulfonic acid (PFNS)	µg/L	0.01	[illegible]	[illegible]		[illegible]	[illegible]		[illegible]	[illegible]		[illegible]	[illegible]		[illegible]	[illegible]		[illegible]	[illegible]	
Perfluorodecane sulfonic acid (PFDS)	µg/L	0.01	[illegible]	[illegible]	0	[illegible]	[illegible]	0	[illegible]	[illegible]	0	[illegible]	[illegible]	0	[illegible]	[illegible]	0	[illegible]	[illegible]	0
PFAS - Perfluoroalkyl Carboxylic Acids																					
Perfluorobutanoic acid (PFBA)	µg/L	0.05	[illegible]	[illegible]	0	[illegible]	[illegible]	0	[illegible]	[illegible]	0	[illegible]	[illegible]	0	[illegible]	[illegible]	0	[illegible]	[illegible]	0
Perfluoropentanoic acid (PFPeA)	µg/L	0.01	[illegible]	[illegible]	0	0.08	0.08	0	0.08	0.08	0	0.06	0.06	0	0.06	0.07	15	[illegible]	[illegible]	0
Perfluorohexanoic acid (PFHxA)	µg/L	0.01	0.06	0.04	40	0.32	0.32	0	0.32	0.31	3	0.04	0.04	0	0.04	0.04	0	[illegible]	[illegible]	0
Perfluoroheptanoic acid (PFHpA)	µg/L	0.01	[illegible]	[illegible]	0	0.16	0.17	6	0.16	0.14	13	[illegible]	[illegible]	0	[illegible]	[illegible]	0	[illegible]	[illegible]	0
Perfluorooctanoic acid (PFOA)	µg/L	0.01	0.10	0.09	11	1.31	1.23	6	1.31	0.88	39	[illegible]	[illegible]	0	[illegible]	[illegible]	0	[illegible]	[illegible]	0
Perfluorononanoic acid (PFNA)	µg/L	0.01	[illegible]	[illegible]	0	0.04	0.04	0	0.04	0.03	29	[illegible]	[illegible]	0	[illegible]	[illegible]	0	[illegible]	[illegible]	0
Perfluorodecanoic acid (PFDA)	µg/L	0.01	[illegible]	[illegible]	0	[illegible]	[illegible]	0	[illegible]	[illegible]	0	[illegible]	[illegible]	0	[illegible]	[illegible]	0	[illegible]	[illegible]	0
Perfluoroundecanoic acid (PFUnDA)	µg/L	0.01	[illegible]	[illegible]	0	[illegible]	[illegible]	0	[illegible]	[illegible]	0	[illegible]	[illegible]	0	[illegible]	[illegible]	0	[illegible]	[illegible]	0
Perfluorododecanoic acid (PFDoDA)	µg/L	0.01	[illegible]	[illegible]	0	[illegible]	[illegible]	0	[illegible]	[illegible]	0	[illegible]	[illegible]	0	[illegible]	[illegible]	0	[illegible]	[illegible]	0
Perfluorotridecanoic acid (PFTrDA)	µg/L	0.01	[illegible]	[illegible]	0	[illegible]	[illegible]	0	[illegible]	[illegible]	0	[illegible]	[illegible]	0	[illegible]	[illegible]	0	[illegible]	[illegible]	0
Perfluorotetradecanoic acid (PFTeDA)	µg/L	0.01	[illegible]	[illegible]	0	[illegible]	[illegible]	0	[illegible]	[illegible]	0	[illegible]	[illegible]	0	[illegible]	[illegible]	0	[illegible]	[illegible]	0
PFAS - (n:2) Fluorotelomer Sulfonic Acids																					
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	µg/L	0.01	[illegible]	[illegible]	0	[illegible]	[illegible]	0	[illegible]	[illegible]	0	[illegible]	[illegible]	0	[illegible]	[illegible]	0	[illegible]	[illegible]	0
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	µg/L	0.05	[illegible]	[illegible]	0	0.11	0.11	0	0.11	0.10	10	[illegible]	[illegible]	0	[illegible]	[illegible]	0	[illegible]	[illegible]	0
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	µg/L	0.01	[illegible]	[illegible]	0	[illegible]	[illegible]	0	[illegible]	0.01	0	[illegible]	[illegible]	0	[illegible]	[illegible]	0	[illegible]	[illegible]	0
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	µg/L	0.01	[illegible]	[illegible]	0	[illegible]	[illegible]	0	[illegible]	[illegible]	0	[illegible]	[illegible]	0	[illegible]	[illegible]	0	[illegible]	[illegible]	0
PFAS - Perfluoroalkyl Sulfonamides																					
Perfluorooctane sulfonamide (FOSA)	µg/L	0.02	[illegible]	[illegible]	0	0.45	0.44	2	0.45	0.23	65	[illegible]	[illegible]	0	[illegible]	[illegible]	0	[illegible]	[illegible]	0
N-Methyl perfluorooctane sulfonamide (MeFOSA)	µg/L	0.05	[illegible]	[illegible]	0	[illegible]	[illegible]	0	[illegible]	[illegible]	0	[illegible]	[illegible]	0	[illegible]	[illegible]	0	[illegible]	[illegible]	0
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	µg/L	0.02	[illegible]	[illegible]	0	[illegible]	[illegible]	0	[illegible]	[illegible]	0	[illegible]	[illegible]	0	[illegible]	[illegible]	0	[illegible]	[illegible]	0
N-methyl perfluorooctane sulfonamidoethanol (MeFOSE)	µg/L	0.05	[illegible]	[illegible]	0	[illegible]	[illegible]	0	[illegible]	[illegible]	0	[illegible]	[illegible]	0	[illegible]	[illegible]	0	[illegible]	[illegible]	0
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	µg/L	0.05	[illegible]	[illegible]	0	[illegible]	[illegible]	0	[illegible]	[illegible]	0	[illegible]	[illegible]	0	[illegible]	[illegible]	0	[illegible]	[illegible]	0
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	µg/L	0.02	[illegible]	[illegible]	0	[illegible]	[illegible]	0	[illegible]	[illegible]	0	[illegible]	[illegible]	0	[illegible]	[illegible]	0	[illegible]	[illegible]	0
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	µg/L	0.05	[illegible]	[illegible]	0	[illegible]	[illegible]	0	[illegible]	[illegible]	0	[illegible]	[illegible]	0	[illegible]	[illegible]	0	[illegible]	[illegible]	0
PFAS																					
Sum of PFHxS and PFOS	µg/L	0.01	2.08	2.01	3	31.6	31.8	1	31.6	18.9	50	0.11	0.11	0	0.11	0.12	9	0.02	0.02	0
Sum of PFAS (WA DER List)	µg/L	0.01	2.26	2.15	5	33.6	33.8	1	33.6	20.46	49	0.21	0.21	0	0.21	0.23	9	0.02	0.02	0
Sum of PFAS	µg/L	0.01	2.53	2.41	5	34.6	34.8	1	34.6	21.09	49	0.21	0.21	0	0.21	0.25	9	0.02	0.02	0

			Date	13 Dec 2023	13 Dec 2023		13 Dec 2023	13 Dec 2023		13 Dec 2023	13 Dec 2023		13 Dec 2023	13 Dec 2023		13 Dec 2023	13 Dec 2023	
			Field ID	0089_PW367_231213	0089_QC215_231213		0089_MW202_231213	0089_QC117_231213		0089_MW202_231213	0089_QC217_231213		0089_MW217_231213	0089_QC118_231213		0089_MW217_231213	0089_QC218_231213	
			Matrix Type	Water	Water		Water	Water		Water	Water		Water	Water		Water	Water	
			Lab Report Number	EP2317690	1053798	RPD	EP2317700	EP2317700	RPD	EP2317700	1053798	RPD	EP2317849	EP2317849	RPD	EP2317849	1053798	RPD
	Unit	LOR																
PFAS - Perfluoroalkyl Sulfonic Acids																		
Perfluorobutane sulfonic acid (PFBS)	µg/L	0.01			0			0			0				0			0
Perfluoropentane sulfonic acid (PFPeS)	µg/L	0.01			0			0			0				0		0.02	0
Perfluorohexane sulfonic acid (PFHxS)	µg/L	0.01		0.05	133	0.02	0.02	0	0.02	0.01	67	0.04	0.09	77	0.04	0.04	0
Perfluoroheptane sulfonic acid (PFHpS)	µg/L	0.01			0			0			0			0				0
Perfluorooctane sulfonic acid (PFOS)	µg/L	0.01	0.02	0.05	100	0.04	0.04	0	0.04	0.04	0	0.29	0.40	32	0.29	0.13	76
Perfluorononanesulfonic acid (PFNS)	µg/L	0.01																
Perfluorodecane sulfonic acid (PFDS)	µg/L	0.01			0			0			0			0				0
PFAS - Perfluoroalkyl Carboxylic Acids																		
Perfluorobutanoic acid (PFBA)	µg/L	0.05			0			0			0	1.5	1.4	7	1.5	1.5	0
Perfluoropentanoic acid (PFPeA)	µg/L	0.01		0.05	86			0			0	5.70	5.22	9	5.70	5.5	4
Perfluorohexanoic acid (PFHxA)	µg/L	0.01		0.04	67			0			0	5.91	5.92	0	5.91	4.8	21
Perfluoroheptanoic acid (PFHpA)	µg/L	0.01			0			0			0	0.86	0.89	3	0.86	0.74	15
Perfluorooctanoic acid (PFOA)	µg/L	0.01			0			0			0	0.34	0.34	0	0.34	0.29	16
Perfluorononanoic acid (PFNA)	µg/L	0.01			0			0			0			0		0.02	0
Perfluorodecanoic acid (PFDA)	µg/L	0.01			0			0			0			0				0
Perfluoroundecanoic acid (PFUnDA)	µg/L	0.01			0			0			0			0				0
Perfluorododecanoic acid (PFDoDA)	µg/L	0.01			0			0			0			0				0
Perfluorotridecanoic acid (PFTrDA)	µg/L	0.01			0			0			0			0				0
Perfluorotetradecanoic acid (PFTeDA)	µg/L	0.01			0			0			0			0				0
PFAS - (n:2) Fluorotelomer Sulfonic Acids																		
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	µg/L	0.01			0			0			0			0			0.02	0
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	µg/L	0.05			0			0			0	21.4	24.8	15	21.4	11	64
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	µg/L	0.01			0			0			0	0.29	0.28	4	0.29	0.27	7
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	µg/L	0.01			0			0			0			0				0
PFAS - Perfluoroalkyl Sulfonamides																		
Perfluorooctane sulfonamide (FOSA)	µg/L	0.02			0			0			0			0				0
N-Methyl perfluorooctane sulfonamide (MeFOSA)	µg/L	0.05			0			0			0			0				0
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	µg/L	0.02			0			0			0			0				0
N-methyl perfluorooctane sulfonamidoethanol (MeFOSE)	µg/L	0.05			0			0			0			0				0
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	µg/L	0.05			0			0			0			0				0
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	µg/L	0.02			0			0			0			0				0
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	µg/L	0.05			0			0			0			0				0
PFAS																		
Sum of PFHxS and PFOS	µg/L	0.01	0.02	0.11	138	0.06	0.06	0	0.06	0.05	18	0.33	0.49	39	0.33	0.17	64
Sum of PFAS (WA DER List)	µg/L	0.01	0.02	0.2	164	0.06	0.06	0	0.06	0.05	18	36.3	39.3	8	36.3	24.27	40
Sum of PFAS	µg/L	0.01	0.02	0.2	164	0.06	0.06	0	0.06		0	36.3	39.3	8	36.3	24.33	39

			Date	11 Dec 2023	11 Dec 2023		11 Dec 2023	11 Dec 2023		11 Dec 2023	11 Dec 2023		11 Dec 2023	11 Dec 2023	
			Field ID	0089_SD335_231211	0089_QC101_231211		0089_SD335_231211	0089_QC201_231211		0089_SD405_231211	0089_QC105_231211		0089_SD405_231211	0089_QC205_231211	
			Matrix Type	Soil	Soil		Soil	Soil		Soil	Soil		Soil	Soil	
			Lab Report Number	EP2317577	EP2317577	RPD	EP2317577	1053798	RPD	EP2317556	EP2317556	RPD	EP2317556	1053798	RPD
	Unit	LOR													
PFAS - Perfluoroalkyl Sulfonic Acids															
Perfluorobutane sulfonic acid (PFBS)	mg/kg	0.0002			0			0				0			0
Perfluoropentane sulfonic acid (PFPeS)	mg/kg	0.0002			0			0				0			0
Perfluorohexane sulfonic acid (PFHxS)	mg/kg	0.0002			0			0				0			0
Perfluoroheptane sulfonic acid (PFHpS)	mg/kg	0.0002			0			0				0			0
Perfluorooctane sulfonic acid (PFOS)	mg/kg	0.0002			0			0				0			0
Perfluorononanesulfonic acid (PFNS)	mg/kg	0.005													
Perfluorodecane sulfonic acid (PFDS)	mg/kg	0.0002			0			0				0			0
PFAS - Perfluoroalkyl Carboxylic Acids															
Perfluorobutanoic acid (PFBA)	mg/kg	0.001			0			0				0			0
Perfluoropentanoic acid (PFPeA)	mg/kg	0.0002			0			0				0			0
Perfluorohexanoic acid (PFHxA)	mg/kg	0.0002			0			0				0			0
Perfluoroheptanoic acid (PFHpA)	mg/kg	0.0002			0			0				0			0
Perfluorooctanoic acid (PFOA)	mg/kg	0.0002			0			0				0			0
Perfluorononanoic acid (PFNA)	mg/kg	0.0002			0			0				0			0
Perfluorodecanoic acid (PFDA)	mg/kg	0.0002			0			0				0			0
Perfluoroundecanoic acid (PFUnDA)	mg/kg	0.0002			0			0				0			0
Perfluorododecanoic acid (PFDoDA)	mg/kg	0.0002			0			0				0			0
Perfluorotridecanoic acid (PFTrDA)	mg/kg	0.0002			0			0				0			0
Perfluorotetradecanoic acid (PFTeDA)	mg/kg	0.0005			0			0				0			0
PFAS - (n:2) Fluorotelomer Sulfonic Acids															
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	mg/kg	0.0005			0			0				0			0
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	mg/kg	0.0005			0			0				0			0
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	mg/kg	0.0005			0			0				0			0
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	mg/kg	0.0005			0			0				0			0
PFAS - Perfluoroalkyl Sulfonamides															
Perfluorooctane sulfonamide (FOSA)	mg/kg	0.0002			0			0				0			0
N-Methyl perfluorooctane sulfonamide (MeFOSA)	mg/kg	0.0005			0			0				0			0
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	mg/kg	0.0002			0			0				0			0
N-methyl perfluorooctane sulfonamidoethanol (MeFOSE)	mg/kg	0.0005			0			0				0			0
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	mg/kg	0.0005			0			0				0			0
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	mg/kg	0.0002			0			0				0			0
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	mg/kg	0.0005			0			0				0			0
PFAS															
Sum of PFHxS and PFOS	mg/kg	0.0002			0			0				0			0
Sum of PFAS (WA DER List)	mg/kg	0.0002			0			0				0			0
Sum of PFAS	mg/kg	0.0002			0			0				0			0

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

			Date	12 Dec 2023	12 Dec 2023		12 Dec 2023	12 Dec 2023		13 Dec 2023	13 Dec 2023		13 Dec 2023	13 Dec 2023	
			Field ID	0089_SD378_231212	0089_QC111_231212		0089_SD378_231212	0089_QC211_231212		0089_SD367_231213	0089_QC116_231213		0089_SD367_231213	0089_QC216_231213	
			Matrix Type	Soil	Soil		Soil	Soil		Soil	Soil		Soil	Soil	
			Lab Report Number	EP2317630	EP2317630	RPD	EP2317630	1053798	RPD	EP2317691	EP2317691	RPD	EP2317691	1053798	RPD
	Unit	LOR													
PFAS - Perfluoroalkyl Sulfonic Acids															
Perfluorobutane sulfonic acid (PFBS)	mg/kg	0.0002			0			0				0			0
Perfluoropentane sulfonic acid (PFPeS)	mg/kg	0.0002			0			0				0			0
Perfluorohexane sulfonic acid (PFHxS)	mg/kg	0.0002			0			0				0			0
Perfluoroheptane sulfonic acid (PFHpS)	mg/kg	0.0002			0			0				0			0
Perfluorooctane sulfonic acid (PFOS)	mg/kg	0.0002			0			0	0.0003	0.0003	0	0.0003		0
Perfluorononanesulfonic acid (PFNS)	mg/kg	0.005													
Perfluorodecane sulfonic acid (PFDS)	mg/kg	0.0002			0			0				0			0
PFAS - Perfluoroalkyl Carboxylic Acids															
Perfluorobutanoic acid (PFBA)	mg/kg	0.001			0			0				0			0
Perfluoropentanoic acid (PFPeA)	mg/kg	0.0002			0			0				0			0
Perfluorohexanoic acid (PFHxA)	mg/kg	0.0002			0			0				0			0
Perfluoroheptanoic acid (PFHpA)	mg/kg	0.0002			0			0				0			0
Perfluorooctanoic acid (PFOA)	mg/kg	0.0002			0			0				0			0
Perfluorononanoic acid (PFNA)	mg/kg	0.0002			0			0				0			0
Perfluorodecanoic acid (PFDA)	mg/kg	0.0002			0			0				0			0
Perfluoroundecanoic acid (PFUnDA)	mg/kg	0.0002			0			0				0			0
Perfluorododecanoic acid (PFDoDA)	mg/kg	0.0002			0			0				0			0
Perfluorotridecanoic acid (PFTrDA)	mg/kg	0.0002			0			0				0			0
Perfluorotetradecanoic acid (PFTeDA)	mg/kg	0.0005			0			0				0			0
PFAS - (n:2) Fluorotelomer Sulfonic Acids															
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	mg/kg	0.0005			0			0				0			0
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	mg/kg	0.0005			0			0				0			0
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	mg/kg	0.0005			0			0				0			0
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	mg/kg	0.0005			0			0				0			0
PFAS - Perfluoroalkyl Sulfonamides															
Perfluorooctane sulfonamide (FOSA)	mg/kg	0.0002			0			0				0			0
N-Methyl perfluorooctane sulfonamide (MeFOSA)	mg/kg	0.0005			0			0				0			0
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	mg/kg	0.0002			0			0				0			0
N-methyl perfluorooctane sulfonamidoethanol (MeFOSE)	mg/kg	0.0005			0			0				0			0
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	mg/kg	0.0005			0			0				0			0
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	mg/kg	0.0002			0			0				0			0
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	mg/kg	0.0005			0			0				0			0
PFAS															
Sum of PFHxS and PFOS	mg/kg	0.0002			0			0	0.0003	0.0003	0	0.0003		0
Sum of PFAS (WA DER List)	mg/kg	0.0002			0			0	0.0003	0.0003	0	0.0003		0
Sum of PFAS	mg/kg	0.0002			0			0	0.0003	0.0003	0	0.0003		0

APPENDIX

C

LABORATORY CERTIFICATES

Cardno

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Stantec

ALSCompass
SAMPLING *Intelligence*

Environmental Division
Perth
Work Order Reference
EP2317554

Telephone - 61-8-9406 1301

se Only

Custody Document for Submissions via ALS Compass App

Project: WA_DOEA_PFASMP_23 **Client:** Stantec **Project Manager:** [redacted]

Phone: [redacted]

ALS Compass COC Reference: 61376; 61375; 61385; 61360; 61357; 61383 **# Samples:** 2 Esky **Sampler:** [redacted]

Phone: [redacted]

Turnaround Requirements: Standard / Urgent

Special Instructions:

Custody:

Relinquished by:	Received by:	Relinquished by:	Received by:
[redacted]	[redacted]		
Date / Time: 11/12/23	Date / Time: 12/12 12pm	Date / Time:	Date / Time:

CHAIN OF CUSTODY

COC#: 61383 *ALS Laboratory:* EP Perth Environmental

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

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP_23

SITE: Stirling SW/PW - AH

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES 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	WA OMP Water Suite WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
001	0089_PW405		11/12/2023 09:28 AM	WATER	ALS: 3 Non ALS: 0	No	X		
002	0089_SW406		11/12/2023 09:29 AM	WATER	ALS: 3 Non ALS: 0	No	X		
003	0089_QC103		11/12/2023 09:31 AM	WATER	ALS: 3 Non ALS: 0	No	X		
004	0089_QC104		11/12/2023 09:33 AM	WATER	ALS: 3 Non ALS: 0	No	X		
005	0089_PW407		11/12/2023 10:48 AM	WATER	ALS: 3 Non ALS: 0	No	X		
006	0089_SW408		11/12/2023 10:54 AM	WATER	ALS: 3 Non ALS: 0	No	X		
007	0089_PW409		11/12/2023 11:55 AM	WATER	ALS: 3 Non ALS: 0	No	X		

CHAIN OF CUSTODY

COC#: 61383 ALS Laboratory: EP Perth Environmental

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

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP_23

SITE: Stirling SW/PW - AH

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted]

QUOTE NO: SY/139/19 B

SAMPLER MOBILE: [redacted] / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES 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	WA OMP Water Suite WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
008	0089_SW410		11/12/2023 11:55 AM	WATER	ALS: 3 Non ALS: 0	No	X		

CHAIN OF CUSTODY

COC#: 61383 ALS Laboratory: EP Perth Environmental

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

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP_23

SITE: Stirling SW/PW - AH

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES 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	0089_PW405	Clear Plastic Bottle - Natural	125 mL	00070522229611	Green	No	
001	0089_PW405	HDPE (no PTFE)	20 mL	00352309067882	Grey	No	
001	0089_PW405	HDPE (no PTFE)	20 mL	00352309067989	Grey	No	
002	0089_SW406	Clear Plastic Bottle - Natural	125 mL	00070522229727	Green	No	
002	0089_SW406	HDPE (no PTFE)	20 mL	00352309068220	Grey	No	
002	0089_SW406	HDPE (no PTFE)	20 mL	00352309068152	Grey	No	
003	0089_QC103	HDPE (no PTFE)	20 mL	00352309068338	Grey	No	
003	0089_QC103	HDPE (no PTFE)	20 mL	00352309030075	Grey	No	
003	0089_QC103	Clear Plastic Bottle - Natural	125 mL	00070522229690	Green	No	
004	0089_QC104	Clear Plastic Bottle - Natural	125 mL	00070522229675	Green	No	
004	0089_QC104	HDPE (no PTFE)	20 mL	00352309067885	Grey	No	
004	0089_QC104	HDPE (no PTFE)	20 mL	00352309068257	Grey	No	
005	0089_PW407	HDPE (no PTFE)	20 mL	00352309068397	Grey	No	
005	0089_PW407	HDPE (no PTFE)	20 mL	00352309067954	Grey	No	
005	0089_PW407	Clear Plastic Bottle - Natural	125 mL	00070522229621	Green	No	
006	0089_SW408	HDPE (no PTFE)	20 mL	00352309068246	Grey	No	
006	0089_SW408	HDPE (no PTFE)	20 mL	00352309068140	Grey	No	
006	0089_SW408	Clear Plastic Bottle - Natural	125 mL	00070522229590	Green	No	
007	0089_PW409	Clear Plastic Bottle - Natural	125 mL	00070522229796	Green	No	
007	0089_PW409	HDPE (no PTFE)	20 mL	00352309068183	Grey	No	
007	0089_PW409	HDPE (no PTFE)	20 mL	00352309068133	Grey	No	
008	0089_SW410	Clear Plastic Bottle - Natural	125 mL	00070522229689	Green	No	
008	0089_SW410	HDPE (no PTFE)	20 mL	00352309067914	Grey	No	
008	0089_SW410	HDPE (no PTFE)	20 mL	00352309068080	Grey	No	

Total Bottle Count: ALS: 24, Non ALS: 0

SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : **EP2317554**

Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: Customer Services EP
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
E-mail	: [redacted]stantec.com	E-mail	: ALSEnviro.Perth@alsglobal.com
Telephone	: ----	Telephone	: +61-8-9406 1301
Facsimile	: ----	Facsimile	: +61-8-9406 1399
Project	: WA_0089_PFASOMP_23	Page	: 1 of 2
Order number	: pfas-omp/Stirling	Quote number	: ES2022MWHAUS0002 (SY/139/19 B)
C-O-C number	: 61383	QC Level	: NEPM 2013 B3 & ALS QC Standard
Site	: Stirling SW/PW - AH		
Sampler	: [redacted] [redacted]		

Dates

Date Samples Received	: 12-Dec-2023 12:00	Issue Date	: 14-Dec-2023
Client Requested Due Date	: 19-Dec-2023	Scheduled Reporting Date	: **19-Dec-2023**

Delivery Details

Mode of Delivery	: Carrier	Security Seal	: Not Available
No. of coolers/boxes	: 2	Temperature	: 12.6 - Ice present
Receipt Detail	:	No. of samples received / analysed	: 8 / 8

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 see scanned COC for sample discrepencies: extra samples , samples not received etc.
- Please direct any queries related to sample condition / numbering / breakages to Sample Receipt (Samples.Perth@alsglobal.com)
- Analytical work for this work order will be conducted at ALS Environmental Perth.
- Please direct any turnaround / technical queries to the laboratory contact designated above.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months) from receipt of samples.
- **pH analysis should be conducted within 6 hours of sampling.**
- **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.**
- 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)	WATER - NT-01 & 02 Ca, Mg, Na, K, Cl, SO4, Alkalinity
EP2317554-001	11-Dec-2023 09:28	0089_PW405_231211	✓	✓
EP2317554-002	11-Dec-2023 09:29	0089_SW406_231211	✓	✓
EP2317554-003	11-Dec-2023 09:31	0089_QC103_231211	✓	✓
EP2317554-004	11-Dec-2023 09:33	0089_QC104_231211	✓	✓
EP2317554-005	11-Dec-2023 10:48	0089_PW407_231211	✓	✓
EP2317554-006	11-Dec-2023 10:54	0089_SW408_231211	✓	✓
EP2317554-007	11-Dec-2023 11:55	0089_PW409_231211	✓	✓
EP2317554-008	11-Dec-2023 11:55	0089_SW410_231211	✓	✓

Proactive Holding Time Report

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

Requested Deliverables

[redacted]
- A4 - AU Tax Invoice (INV) — Email — [redacted]cardno.com.au

DERP LAB REPORTS
- *AU Certificate of Analysis - NATA (COA) — Email — derp.labreports@esdat.com.au
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI) — Email — derp.labreports@esdat.com.au
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC) — Email — derp.labreports@esdat.com.au
- A4 - AU Sample Receipt Notification - Environmental HT (SRN) — Email — derp.labreports@esdat.com.au
- Chain of Custody (CoC) (COC) — Email — derp.labreports@esdat.com.au
- EDI Format - ESDAT (ESDAT) — Email — derp.labreports@esdat.com.au

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

CERTIFICATE OF ANALYSIS

Work Order	: **EP2317554**	Page	: 1 of 12
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: Customer Services EP
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: +61-8-9406 1301
Project	: WA_0089_PFASOMP_23	Date Samples Received	: 12-Dec-2023 12:00
Order number	: pfas-omp/Stirling	Date Analysis Commenced	: 13-Dec-2023
C-O-C number	: 61383	Issue Date	: 19-Dec-2023 17:14
Sampler	: [redacted]		
Site	: Stirling SW/PW - AH		
Quote number	: SY/139/19 B		
No. of samples received	: 8		
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]	Laboratory Manager (Perth)	Perth Inorganics, Wangara, WA
[redacted]	Senior Organic Chemist	Perth Organics, Wangara, WA

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.
- As per QWI – EN55-3 Data Interpreting Procedures, Ionic balances are typically calculated using Major Anions - Chloride, Alkalinity and Sulfate; and Major Cations - Calcium, Magnesium, Potassium and Sodium. Where applicable and dependent upon sample matrix, the Ionic Balance may also include the additional contribution of Ammonia, Dissolved Metals by ICPMS and H+ to the Cations and Nitrate, SiO2 and Fluoride to the Anions.
- Sodium Adsorption Ratio (where reported): Where results for Na, Ca or Mg are <LOR, a concentration at half the reported LOR is incorporated into the SAR calculation. This represents a conservative approach for Na relative to the assumption that <LOR = zero concentration and a conservative approach for Ca & Mg relative to the assumption that <LOR is equivalent to the LOR concentration.
- 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.
- ED045G: The presence of Thiocyanate, Thiosulfate and Sulfite can positively contribute to the chloride result, thereby may bias results higher than expected. Results should be scrutinised accordingly.

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_QC103_231211	----	----	----	----
				Sampling date / time	11-Dec-2023 09:31	----	----	----	----
Compound	CAS Number	LOR	Unit		EP2317554-003	--------	--------	--------	--------
					Result	----	----	----	----
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	----	----	----	----
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	----	----	----	----
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		117	----	----	----	----
Total Alkalinity as CaCO3	----	1	mg/L		117	----	----	----	----
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		2990	----	----	----	----
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		21900	----	----	----	----
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		490	----	----	----	----
Magnesium	7439-95-4	1	mg/L		1580	----	----	----	----
Sodium	7440-23-5	1	mg/L		12700	----	----	----	----
Potassium	7440-09-7	1	mg/L		636	----	----	----	----
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		682	----	----	----	----
ø Total Cations	----	0.01	meq/L		723	----	----	----	----
ø Ionic Balance	----	0.01	%		2.90	----	----	----	----
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	----	----	----	----

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_QC103_231211	----	----	----	----
				Sampling date / time	11-Dec-2023 09:31	---	---	---	---
Compound	CAS Number	LOR	Unit		EP2317554-003	--------	--------	--------	--------
					Result	---	---	---	---
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	----	----	----	----
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									

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_QC103_231211	----	----	----	----
				Sampling date / time	11-Dec-2023 09:31	---	---	---	---
Compound	CAS Number	LOR	Unit		EP2317554-003	--------	--------	--------	--------
					Result	---	---	---	---
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
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	%		**90.5**	----	----	----	----
13C8-PFOA	---	0.02	%		**109**	----	----	----	----

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_PW405_231211	0089_SW406_231211	0089_QC104_231211	0089_PW407_231211	0089_SW408_231211
				Sampling date / time	11-Dec-2023 09:28	11-Dec-2023 09:29	11-Dec-2023 09:33	11-Dec-2023 10:48	11-Dec-2023 10:54
Compound	CAS Number	LOR	Unit		EP2317554-001	EP2317554-002	EP2317554-004	EP2317554-005	EP2317554-006
					Result	Result	Result	Result	Result
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	<1	<1	<1	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	<1	<1	<1	<1
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		116	147	148	106	136
Total Alkalinity as CaCO3	---	1	mg/L		116	147	148	106	136
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		2990	2860	3000	3170	2910
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		22000	21700	21900	22900	21500
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		491	485	493	495	503
Magnesium	7439-95-4	1	mg/L		1590	1540	1570	1620	1590
Sodium	7440-23-5	1	mg/L		12800	12400	12600	12900	12800
Potassium	7440-09-7	1	mg/L		637	621	631	650	642
EN055: Ionic Balance									
ø Total Anions	---	0.01	meq/L		685	675	683	714	670
ø Total Cations	---	0.01	meq/L		728	706	718	736	729
ø Ionic Balance	---	0.01	%		3.06	2.29	2.48	1.49	4.24
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

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_PW405_231211	0089_SW406_231211	0089_QC104_231211	0089_PW407_231211	0089_SW408_231211
				Sampling date / time	11-Dec-2023 09:28	11-Dec-2023 09:29	11-Dec-2023 09:33	11-Dec-2023 10:48	11-Dec-2023 10:54
Compound	CAS Number	LOR	Unit		EP2317554-001	EP2317554-002	EP2317554-004	EP2317554-005	EP2317554-006
					Result	Result	Result	Result	Result
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**	**0.04**	<0.02	<0.02
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		<0.02	**0.07**	**0.07**	<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
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									

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_PW405_231211	0089_SW406_231211	0089_QC104_231211	0089_PW407_231211	0089_SW408_231211
				Sampling date / time	11-Dec-2023 09:28	11-Dec-2023 09:29	11-Dec-2023 09:33	11-Dec-2023 10:48	11-Dec-2023 10:54
Compound	CAS Number	LOR	Unit		EP2317554-001	EP2317554-002	EP2317554-004	EP2317554-005	EP2317554-006
					Result	Result	Result	Result	Result
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
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	**0.12**	**0.12**	<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	**0.12**	**0.12**	<0.01	<0.01
EP231S: PFAS Surrogate									
13C4-PFOS	---	0.02	%		**97.5**	**101**	**103**	**102**	**99.4**
13C8-PFOA	---	0.02	%		**114**	**114**	**113**	**98.6**	**94.9**

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_PW409_231211	0089_SW410_231211	----	----	----
				Sampling date / time	11-Dec-2023 11:55	11-Dec-2023 11:55	----	----	----
Compound	CAS Number	LOR	Unit		EP2317554-007	EP2317554-008	--------	--------	--------
					Result	Result	----	----	----
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	<1	----	----	----
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	<1	----	----	----
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		124	662	----	----	----
Total Alkalinity as CaCO3	----	1	mg/L		124	662	----	----	----
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		3430	2280	----	----	----
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		24900	15700	----	----	----
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		572	420	----	----	----
Magnesium	7439-95-4	1	mg/L		1880	1150	----	----	----
Sodium	7440-23-5	1	mg/L		15200	8950	----	----	----
Potassium	7440-09-7	1	mg/L		766	524	----	----	----
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		776	504	----	----	----
ø Total Cations	----	0.01	meq/L		864	518	----	----	----
ø Ionic Balance	----	0.01	%		5.35	1.44	----	----	----
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		<0.01	0.02	----	----	----
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		<0.01	<0.01	----	----	----
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	<0.02	----	----	----

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_PW409_231211	0089_SW410_231211	----	----	----
				Sampling date / time	11-Dec-2023 11:55	11-Dec-2023 11:55	----	----	----
Compound	CAS Number	LOR	Unit		EP2317554-007	EP2317554-008	--------	--------	--------
					Result	Result	—	—	—
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		<0.1	<0.1	----	----	----
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		<0.01	<0.01	----	----	----
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		<0.05	<0.05	----	----	----
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L		<0.02	<0.02	----	----	----
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L		<0.05	<0.05	----	----	----
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L		<0.05	<0.05	----	----	----
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L		<0.05	<0.05	----	----	----
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L		<0.05	<0.05	----	----	----
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L		<0.02	<0.02	----	----	----
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L		<0.02	<0.02	----	----	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids									

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_PW409_231211	0089_SW410_231211	----	----	----
				Sampling date / time	11-Dec-2023 11:55	11-Dec-2023 11:55	----	----	----
Compound	CAS Number	LOR	Unit		EP2317554-007	EP2317554-008	--------	--------	--------
					Result	Result	----	----	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L		<0.05	<0.05	----	----	----
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		<0.05	<0.05	----	----	----
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		<0.05	<0.05	----	----	----
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L		<0.05	<0.05	----	----	----
EP231P: PFAS Sums									
Sum of PFAS	---	0.01	µg/L		<0.01	**0.02**	----	----	----
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		<0.01	**0.02**	----	----	----
Sum of PFAS (WA DER List)	---	0.01	µg/L		<0.01	**0.02**	----	----	----
EP231S: PFAS Surrogate									
13C4-PFOS	---	0.02	%		**90.9**	**105**	----	----	----
13C8-PFOA	---	0.02	%		**123**	**108**	----	----	----

Surrogate Control Limits

Sub-Matrix: GROUNDWATER		Recovery Limits (%)	
Compound	CAS Number	Low	High
EP231S: PFAS Surrogate			
13C4-PFOS	---	65	140
13C8-PFOA	---	71	133

Sub-Matrix: SURFACE WATER		Recovery Limits (%)	
Compound	CAS Number	Low	High
EP231S: PFAS Surrogate			
13C4-PFOS	---	65	140
13C8-PFOA	---	71	133

QUALITY CONTROL REPORT

Work Order	: **EP2317554**	Page	: 1 of 11
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: Customer Services EP
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: +61-8-9406 1301
Project	: WA_0089_PFASOMP_23	Date Samples Received	: 12-Dec-2023
Order number	: pfas-omp/Stirling	Date Analysis Commenced	: 13-Dec-2023
C-O-C number	: 61383	Issue Date	: 19-Dec-2023
Sampler	: [redacted]		
Site	: Stirling SW/PW - AH		
Quote number	: SY/139/19 B		
No. of samples received	: 8		
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]	Laboratory Manager (Perth)	Perth Inorganics, Wangara, WA
[redacted]	Senior Organic Chemist	Perth Organics, Wangara, WA

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 (%)
ED037P: Alkalinity by PC Titrator (QC Lot: 5500016)									
EP2317554-002	0089_SW406_231211	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	147	147	0.0	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	147	147	0.0	0% - 20%
EP2317575-006	Anonymous	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	643	647	0.7	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	643	647	0.7	0% - 20%
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QC Lot: 5490438)									
EP2317554-001	0089_PW405_231211	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	2990	2980	0.1	0% - 20%
EP2317575-001	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	69	70	0.0	0% - 20%
ED045G: Chloride by Discrete Analyser (QC Lot: 5490439)									
EP2317554-001	0089_PW405_231211	ED045G: Chloride	16887-00-6	1	mg/L	22000	21900	0.4	0% - 20%
EP2317575-001	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	64	64	0.0	0% - 20%
ED093F: Dissolved Major Cations (QC Lot: 5490764)									
EP2317554-001	0089_PW405_231211	ED093F: Calcium	7440-70-2	1	mg/L	491	512	4.2	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	1590	1640	3.4	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	12800	13200	3.8	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	637	664	4.1	0% - 20%
EP2317555-003	Anonymous	ED093F Calcium	7440-70-2	1	mg/L	101	101	0.0	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	67	68	0.0	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	369	372	1.0	0% - 20%

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 (%)
ED093F: Dissolved Major Cations (QC Lot: 5490764) - continued									
EP2317555-003	Anonymous	ED093F: Potassium	7440-09-7	1	mg/L	22	22	0.0	0% - 20%
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 5493189)									
EP2317575 005	Anonymous	EP231X: Perfluorohexane sulfonic acid (PFHxS)	355 46 4	0 01	µg/L	1 33	1 31	1 3	0% 20%
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	0.30	0.30	0.0	0% - 20%
		EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	0.14	0.14	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	0.14	0.14	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	0.04	0.05	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: 5493278)									
EP2317546-001	Anonymous	EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	0.18	0.19	0.0	0% - 50%
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	0.56	0.54	5.0	0% - 20%
		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
EP2317575-002	Anonymous	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
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 5493189)									
EP2317575-005	Anonymous	EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	0.14	0.13	8.4	0% - 50%
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	8.97	9.59	6.6	0% - 20%
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	7.67	7.44	3.0	0% - 20%
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	1.31	1.30	1.4	0% - 20%
		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	3.3	3.0	9.9	0% - 20%
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 5493278)									
EP2317546-001	Anonymous	EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	0.04	0.03	0.0	No Limit
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	0.03	0.03	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	0.17	0.17	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 (%)
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 5493278) - continued									
EP2317546-001	Anonymous	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
EP2317575-002	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: 5493189)									
EP2317575-005	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
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 5493278)									
EP2317546-001	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

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: 5493278) - continued									
EP2317546-001	Anonymous	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
EP2317575-002	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: 5493189)									
EP2317575-005	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	1.30	1.31	0.0	0% - 20%
		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: 5493278)									
EP2317546-001	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	0.06	0.06	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
EP2317575-002	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

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: 5493278) - continued									
EP2317575-002	Anonymous	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: 5493189)									
EP2317575-005	Anonymous	EP231X: Sum of PFAS	----	0.01	µg/L	24.6	24.7	0.3	0% - 20%
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	1.63	1.61	1.2	0% - 20%
		EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	24.5	24.5	0.2	0% - 20%
EP231P: PFAS Sums (QC Lot: 5493278)									
EP2317546-001	Anonymous	EP231X: Sum of PFAS	----	0.01	µg/L	1.04	1.04	0.0	0% - 20%
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	0.74	0.73	1.4	0% - 20%
		EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	1.04	1.02	1.9	0% - 20%
EP2317575-002	Anonymous	EP231X: Sum of PFAS	----	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	<0.01	<0.01	0.0	No Limit

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
ED037P: Alkalinity by PC Titrator (QCLot: 5500016)								
ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	---	---	---	---
ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	---	---	---	---
ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	<1	---	---	---	---
ED037-P: Total Alkalinity as CaCO3	---	1	mg/L	<1	20 mg/L	102	85.1	126
				<1	200 mg/L	102	90.5	111
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 5490438)								
ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<1	25 mg/L	98.9	89.9	112
				<1	500 mg/L	94.5	89.9	112
ED045G: Chloride by Discrete Analyser (QCLot: 5490439)								
ED045G: Chloride	16887-00-6	1	mg/L	<1	10 mg/L	97.5	88.6	113
				<1	1000 mg/L	97.0	88.6	113
ED093F: Dissolved Major Cations (QCLot: 5490764)								
ED093F: Calcium	7440-70-2	1	mg/L	<1	50 mg/L	102	86.5	117
ED093F: Magnesium	7439-95-4	1	mg/L	<1	50 mg/L	99.4	88.4	110
ED093F: Sodium	7440-23-5	1	mg/L	<1	50 mg/L	98.6	91.4	113
ED093F: Potassium	7440-09-7	1	mg/L	<1	50 mg/L	97.1	84.6	108
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5493189)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.2218 µg/L	101	72.0	130
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.2352 µg/L	94.6	71.0	127
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	0.2373 µg/L	90.4	68.0	131
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.238 µg/L	91.2	69.0	134
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.232 µg/L	92.7	65.0	140
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.241 µg/L	93.4	53.0	142
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5493278)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.2218 µg/L	104	72.0	130
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.2352 µg/L	119	71.0	127
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	0.2373 µg/L	96.7	68.0	131
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.238 µg/L	101	69.0	134
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.232 µg/L	87.3	65.0	140
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.241 µg/L	98.8	53.0	142

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: 5493189)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	1.25 µg/L	95.3	73.0	129
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	0.25 µg/L	122	72.0	129
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	0.25 µg/L	88.8	72.0	129
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	0.25 µg/L	96.2	72.0	130
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	0.25 µg/L	105	71.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	0.25 µg/L	103	69.0	130
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	0.25 µg/L	118	71.0	129
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	0.25 µg/L	131	69.0	133
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	0.25 µg/L	118	72.0	134
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	0.25 µg/L	129	65.0	144
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	0.25 µg/L	98.2	71.0	132
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5493278)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	1.25 µg/L	116	73.0	129
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	0.25 µg/L	105	72.0	129
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	0.25 µg/L	103	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	102	71.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	0.25 µg/L	97.8	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	116	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	105	65.0	144
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	0.25 µg/L	102	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5493189)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.25 µg/L	113	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	125	60.5	138
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	0.625 µg/L	91.3	68.3	134
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	0.625 µg/L	104	62.2	138
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	0.25 µg/L	112	65.0	136
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	0.25 µg/L	93.8	61.0	135

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: 5493278)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.25 µg/L	71.2	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	114	60.5	138
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	0.625 µg/L	92.2	68.3	134
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	0.625 µg/L	91.4	62.2	138
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	0.25 µg/L	104	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
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5493189)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.2343 µg/L	92.4	63.0	143
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	0.2378 µg/L	86.6	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	0.24 µg/L	104	67.0	138
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	0.241 µg/L	86.9	64.2	133
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5493278)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.2343 µg/L	109	63.0	143
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	0.2378 µg/L	102	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	0.24 µg/L	101	67.0	138
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	0.241 µg/L	86.1	64.2	133
EP231P: PFAS Sums (QCLot: 5493189)								
EP231X: Sum of PFAS	---	0.01	µg/L	<0.01	---	---	---	---
EP231X: Sum of PFHxS and PFOS	355-46-4/17 63-23-1	0.01	µg/L	<0.01	---	---	---	---
EP231X: Sum of PFAS (WA DER List)	---	0.01	µg/L	<0.01	---	---	---	---
EP231P: PFAS Sums (QCLot: 5493278)								
EP231X: Sum of PFAS	---	0.01	µg/L	<0.01	---	---	---	---
EP231X: Sum of PFHxS and PFOS	355-46-4/17 63-23-1	0.01	µg/L	<0.01	---	---	---	---
EP231X: Sum of PFAS (WA DER List)	---	0.01	µg/L	<0.01	---	---	---	---

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**

Matrix Spike (MS) Report

Sub-Matrix: **WATER**

Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report: Spike Concentration	Matrix Spike (MS) Report: SpikeRecovery(%) MS	Matrix Spike (MS) Report: Acceptable Limits (%) Low	Matrix Spike (MS) Report: Acceptable Limits (%) High
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 5490438)							
EP2317554-001	0089_PW405_231211	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	100 mg/L	# Not Determined	70.4	130
ED045G: Chloride by Discrete Analyser (QCLot: 5490439)							
EP2317554-001	0089_PW405_231211	ED045G: Chloride	16887-00-6	200 mg/L	# Not Determined	70.0	130
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5493278)							
EP2317575-001	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.2218 µg/L	102	72.0	129
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.232 µg/L	117	71.0	127
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.2352 µg/L	91.4	68.0	129
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.238 µg/L	92.2	69.0	134
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.232 µg/L	# Not Determined	65.0	140
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.241 µg/L	107	53.0	129
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5493278)							
EP2317575-001	Anonymous	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	1.25 µg/L	117	73.0	142
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.25 µg/L	106	72.0	129
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.25 µg/L	106	72.0	129
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.25 µg/L	103	72.0	130
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.25 µg/L	116	71.0	133
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.25 µg/L	99.2	69.0	130
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.25 µg/L	93.6	71.0	134
		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	89.2	72.0	134
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.25 µg/L	101	65.0	144
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.25 µg/L	103	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5493278)							
EP2317575-001	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.25 µg/L	68.8	59.0	135
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.625 µg/L	95.5	70.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.625 µg/L	86.2	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.625 µg/L	86.3	70.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.625 µg/L	98.5	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.25 µg/L	98.7	65.0	136
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.25 µg/L	98.6	61.0	135

Sub-Matrix: **WATER**

Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report: Spike Concentration	Matrix Spike (MS) Report: SpikeRecovery(%) MS	Matrix Spike (MS) Report: Acceptable Limits (%) Low	Matrix Spike (MS) Report: Acceptable Limits (%) High
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5493278)							
EP2317575-001	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.234 µg/L	113	63.0	143
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.2378 µg/L	100	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.24 µg/L	116	67.0	138
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.2415 µg/L	92.3	70.0	130

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **EP2317554**	Page	: 1 of 6
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Telephone	: +61-8-9406 1301
Project	: WA_0089_PFASOMP_23	Date Samples Received	: 12-Dec-2023
Site	: Stirling SW/PW - AH	Issue Date	: 19-Dec-2023
Sampler	: [redacted]	No. of samples received	: 8
Order number	: pfas-omp/Stirling	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.**
- **Matrix Spike outliers exist - please see following pages for full details.**
- **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 : Quality Control Samples

Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

Matrix: **WATER**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
Matrix Spike (MS) Recoveries							
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA	EP2317554--001	0089_PW405_231211	**Sulfate as SO4 - Turbidimetric**	14808-79-8	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
ED045G: Chloride by Discrete Analyser	EP2317554--001	0089_PW405_231211	**Chloride**	16887-00-6	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
EP231A: Perfluoroalkyl Sulfonic Acids	EP2317575--001	Anonymous	**Perfluorooctane sulfonic acid (PFOS)**	1763-23-1	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**

Outliers : Frequency of Quality Control Samples

Matrix: **WATER**

Quality Control Sample Type		Count		Rate (%)		Quality Control Specification
Analytical Methods	Method	QC	Regular	Actual	Expected	
Matrix Spikes (MS)						
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	27	3.70	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*			*Analysis*		
			Date extracted	*Due for extraction*	*Evaluation*	*Date analysed*	*Due for analysis*	*Evaluation*
ED037P: Alkalinity by PC Titrator								
Clear Plastic Bottle - Natural (ED037-P)								
0089_PW405_231211,	0089_SW406_231211,	**11-Dec-2023**	**----**	----	----	**18-Dec-2023**	25-Dec-2023	✓
0089_QC103_231211,	0089_QC104_231211,							
0089_PW407_231211,	0089_SW408_231211,							
0089_PW409_231211,	0089_SW410_231211							

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
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA								
Clear Plastic Bottle - Natural (ED041G)								
0089_PW405_231211,	0089_SW406_231211,	**11-Dec-2023**	**----**	----	----	**19-Dec-2023**	08-Jan-2024	✓
0089_QC103_231211,	0089_QC104_231211,							
0089_PW407_231211,	0089_SW408_231211,							
0089_PW409_231211,	0089_SW410_231211							
ED045G: Chloride by Discrete Analyser								
Clear Plastic Bottle - Natural (ED045G)								
0089_PW405_231211,	0089_SW406_231211,	**11-Dec-2023**	**----**	----	----	**19-Dec-2023**	08-Jan-2024	✓
0089_QC103_231211,	0089_QC104_231211,							
0089_PW407_231211,	0089_SW408_231211,							
0089_PW409_231211,	0089_SW410_231211							
ED093F: Dissolved Major Cations								
Clear Plastic Bottle - Natural (ED093F)								
0089_PW405_231211,	0089_SW406_231211,	**11-Dec-2023**	**----**	----	----	**15-Dec-2023**	18-Dec-2023	✓
0089_QC103_231211,	0089_QC104_231211,							
0089_PW407_231211,	0089_SW408_231211,							
0089_PW409_231211,	0089_SW410_231211							
EP231A: Perfluoroalkyl Sulfonic Acids								
HDPE (no PTFE) (EP231X)								
0089_QC104_231211,	0089_PW407_231211,	**11-Dec-2023**	**14-Dec-2023**	08-Jun-2024	✓	**14-Dec-2023**	08-Jun-2024	✓
0089_SW408_231211,	0089_SW410_231211							
HDPE (no PTFE) (EP231X)								
0089_PW405_231211,	0089_SW406_231211,	**11-Dec-2023**	**14-Dec-2023**	08-Jun-2024	✓	**15-Dec-2023**	08-Jun-2024	✓
0089_QC103_231211,	0089_PW409_231211							
EP231B: Perfluoroalkyl Carboxylic Acids								
HDPE (no PTFE) (EP231X)								
0089_QC104_231211,	0089_PW407_231211,	**11-Dec-2023**	**14-Dec-2023**	08-Jun-2024	✓	**14-Dec-2023**	08-Jun-2024	✓
0089_SW408_231211,	0089_SW410_231211							
HDPE (no PTFE) (EP231X)								
0089_PW405_231211,	0089_SW406_231211,	**11-Dec-2023**	**14-Dec-2023**	08-Jun-2024	✓	**15-Dec-2023**	08-Jun-2024	✓
0089_QC103_231211,	0089_PW409_231211							
EP231C: Perfluoroalkyl Sulfonamides								
HDPE (no PTFE) (EP231X)								
0089_QC104_231211,	0089_PW407_231211,	**11-Dec-2023**	**14-Dec-2023**	08-Jun-2024	✓	**14-Dec-2023**	08-Jun-2024	✓
0089_SW408_231211,	0089_SW410_231211							
HDPE (no PTFE) (EP231X)								
0089_PW405_231211,	0089_SW406_231211,	**11-Dec-2023**	**14-Dec-2023**	08-Jun-2024	✓	**15-Dec-2023**	08-Jun-2024	✓
0089_QC103_231211,	0089_PW409_231211							

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) 0089_QC104_231211, 0089_PW407_231211, 0089_SW408_231211, 0089_SW410_231211	**11-Dec-2023**	**14-Dec-2023**	08-Jun-2024	✓	**14-Dec-2023**	08-Jun-2024	✓
HDPE (no PTFE) (EP231X) 0089_PW405_231211, 0089_SW406_231211, 0089_QC103_231211, 0089_PW409_231211	**11-Dec-2023**	**14-Dec-2023**	08-Jun-2024	✓	**15-Dec-2023**	08-Jun-2024	✓
EP231P: PFAS Sums							
HDPE (no PTFE) (EP231X) 0089_QC104_231211, 0089_PW407_231211, 0089_SW408_231211, 0089_SW410_231211	**11-Dec-2023**	**14-Dec-2023**	08-Jun-2024	✓	**14-Dec-2023**	08-Jun-2024	✓
HDPE (no PTFE) (EP231X) 0089_PW405_231211, 0089_SW406_231211, 0089_QC103_231211, 0089_PW409_231211	**11-Dec-2023**	**14-Dec-2023**	08-Jun-2024	✓	**15-Dec-2023**	08-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)							
Alkalinity by Auto Titrator	ED037-P	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	3	27	**11.11**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Alkalinity by Auto Titrator	ED037-P	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	27	**7.41**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Alkalinity by Auto Titrator	ED037-P	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	27	**7.41**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Chloride by Discrete Analyser	ED045G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	27	**3.70**	**5.00**	×	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	20	**5.00**	**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
Alkalinity by Auto Titrator	ED037-P	WATER	In house: Referenced to APHA 2320 B This procedure determines alkalinity by automated measurement (e.g. PC Titrate) on a settled supernatant aliquot of the sample using pH 4.5 for indicating the total alkalinity end-point. This method is compliant with NEPM Schedule B(3)
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	WATER	In house: Referenced to APHA 4500-SO4. Dissolved sulfate is determined in a 0.45um filtered sample. Sulfate ions are converted to a barium sulfate suspension in an acetic acid medium with barium chloride. Light absorbance of the BaSO4 suspension is measured by a photometer and the SO4-2 concentration is determined by comparison of the reading with a standard curve. This method is compliant with NEPM Schedule B(3)
Chloride by Discrete Analyser	ED045G	WATER	In house: Referenced to APHA 4500 Cl - G.The thiocyanate ion is liberated from mercuric thiocyanate through sequestration of mercury by the chloride ion to form non-ionised mercuric chloride. In the presence of ferric ions the liberated thiocynate forms highly-coloured ferric thiocynate which is measured at 480 nm.
Major Cations - Dissolved	ED093F	WATER	In house: Referenced to APHA 3120 and 3125; USEPA SW 846 - 6010 and 6020; Cations are determined by either ICP-AES or ICP-MS techniques. This method is compliant with NEPM Schedule B(3) Sodium Adsorption Ratio is calculated from Ca, Mg and Na which determined by ALS in house method QWI-EN/ED093F. This method is compliant with NEPM Schedule B(3) Hardness parameters are calculated based on APHA 2340 B. This method is compliant with NEPM Schedule B(3)
Ionic Balance by PCT DA and Turbi SO4 DA	* EN055 - PG	WATER	In house: Referenced to APHA 1030F. This method is compliant with NEPM Schedule B(3)
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.

ALSCompass
SAMPLING *Intelligence*

ALS

Environmental Division
Perth
Work Order Reference
EP2317555

Telephone - 61-8-9406 1301

Custody Document for Submissions via ALS Compass App

Project: WA_0059_PERSMP_23 **Client:** Stantec **Project Manager:** [redacted]
Phone:

ALS Compass COC Reference: 61376; 61375; 61385; 61360; 61357; 61383 **# Samples:** 2 Esky **Sampler:** [redacted]
Phone:

Turnaround Requirements: Standard / Urgent

Special Instructions:

Custody:

Relinquished by:	Received by:	Relinquished by:	Received by:
[redacted]	[redacted]		
Date / Time: 11/12/23	Date / Time: 12/12 12pm	Date / Time:	Date / Time:

CHAIN OF CUSTODY

ALS COC#: 61385 ALS Laboratory: EP Perth Environmental

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

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP_23

SITE: Stirling GW - AH

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES 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	WA OMP Water Suite WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
001	0089_MW228		11/12/2023 09:25 AM	WATER	ALS: 3 Non ALS: 0	No	X		
002	0089_QC102		11/12/2023 09:27 AM	WATER	ALS: 3 Non ALS: 0	No	X		
003	0089_MW227		11/12/2023 10:36 AM	WATER	ALS: 3 Non ALS: 0	No	X		
~~004~~ SNR	0089_MW226		11/12/2023 11:51 AM	WATER	ALS: 3 Non ALS: 0	No	X		
005	0089_MW215		11/12/2023 01:26 PM	WATER	ALS: 3 Non ALS: 0	No	X		
006	0089_MW225		11/12/2023 02:44 PM	WATER	ALS: 3 Non ALS: 0	No	X		

CHAIN OF CUSTODY

(ALS) COC#: 61385 *ALS Laboratory:* EP Perth Environmental

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP_23

SITE: Stirling GW - AH

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO: [redacted]

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

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	0089_MW228	Clear Plastic Bottle - Natural	125 mL	00070522229734	Green	No	
001	0089_MW228	HDPE (no PTFE)	20 mL	00352309067988	Grey	No	
001	0089_MW228	HDPE (no PTFE)	20 mL	00352309067927	Grey	No	
002	0089_QC102	Clear Plastic Bottle - Natural	125 mL	00070522229840	Green	No	
002	0089_QC102	HDPE (no PTFE)	20 mL	00352309068384	Grey	No	
002	0089_QC102	HDPE (no PTFE)	20 mL	00352309068402	Grey	No	
003	0089_MW227	Clear Plastic Bottle - Natural	125 mL	00070522229587	Green	No	
003	0089_MW227	HDPE (no PTFE)	20 mL	00352309068038	Grey	No	
003	0089_MW227	HDPE (no PTFE)	20 mL	00352309030043	Grey	No	
004	0089_MW226	Clear Plastic Bottle - Natural	125 mL	00070522229591	Green	No	
004	0089_MW226	HDPE (no PTFE)	20 mL	00352309068001	Grey	No	
004	0089_MW226	HDPE (no PTFE)	20 mL	00352309068282	Grey	No	
005	0089_MW215	Clear Plastic Bottle - Natural	125 mL	00070522229674	Green	No	
005	0089_MW215	HDPE (no PTFE)	20 mL	00352309068055	Grey	No	
005	0089_MW215	HDPE (no PTFE)	20 mL	00352309067872	Grey	No	
006	0089_MW225	HDPE (no PTFE)	20 mL	00352309068170	Grey	No	
006	0089_MW225	HDPE (no PTFE)	20 mL	00352309068232	Grey	No	
006	0089_MW225	Clear Plastic Bottle - Natural	125 mL	00070522229921	Green	No	

Total Bottle Count: ALS: 18, Non ALS: 0

SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : **EP2317555**

Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: Customer Services EP
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
E-mail	: [redacted]stantec.com	E-mail	: ALSEnviro.Perth@alsglobal.com
Telephone	: ----	Telephone	: +61-8-9406 1301
Facsimile	: ----	Facsimile	: +61-8-9406 1399
Project	: WA_0089_PFASOMP_23	Page	: 1 of 2
Order number	: pfas-omp/Stirling	Quote number	: ES2022MWHAUS0002 (SY/139/19 B)
C-O-C number	: 61385	QC Level	: NEPM 2013 B3 & ALS QC Standard
Site	: Stirling GW - AH		
Sampler	: [redacted] [redacted]		

Dates

Date Samples Received	: 12-Dec-2023 12:00	Issue Date	: 14-Dec-2023
Client Requested Due Date	: 19-Dec-2023	Scheduled Reporting Date	: **19-Dec-2023**

Delivery Details

Mode of Delivery	: Carrier	Security Seal	: Not Available
No. of coolers/boxes	: 2	Temperature	: 12.6 - Ice present
Receipt Detail	:	No. of samples received / analysed	: 5 / 5

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 see scanned COC for sample discrepencies: extra samples , samples not received etc.
- Please direct any queries related to sample condition / numbering / breakages to Sample Receipt (Samples.Perth@alsglobal.com)
- Analytical work for this work order will be conducted at ALS Environmental Perth.
- Please direct any turnaround / technical queries to the laboratory contact designated above.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months) from receipt of samples.
- **pH analysis should be conducted within 6 hours of sampling.**
- **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.**
- 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)	WATER - NT-01 & 02 Ca, Mg, Na, K, Cl, SO4, Alkalinity
EP2317555-001	11-Dec-2023 09:25	0089_MW228_231211	✓	✓
EP2317555-002	11-Dec-2023 09:27	0089_QC102_231211	✓	✓
EP2317555-003	11-Dec-2023 10:36	0089_MW227_231211	✓	✓
EP2317555-005	11-Dec-2023 13:26	0089_MW215_231211	✓	✓
EP2317555-006	11-Dec-2023 14:44	0089_MW225_231211	✓	✓

Proactive Holding Time Report

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

Requested Deliverables

[redacted]

- A4 - AU Tax Invoice (INV)	Email	[redacted]cardno.com.au
DERP LAB REPORTS		
- EDI Format - ESDAT (ESDAT)	Email	derp.labreports@esdat.com.au

[redacted]

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

CERTIFICATE OF ANALYSIS

Work Order	: **EP2317555**	Page	: 1 of 6
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: Customer Services EP
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: +61-8-9406 1301
Project	: WA_0089_PFASOMP_23	Date Samples Received	: 12-Dec-2023 12:00
Order number	: pfas-omp/Stirling	Date Analysis Commenced	: 13-Dec-2023
C-O-C number	: 61385	Issue Date	: 19-Dec-2023 23:00
Sampler	: [redacted]		
Site	: Stirling GW - AH		
Quote number	: SY/139/19 B		
No. of samples received	: 5		
No. of samples analysed	: 5		

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]	Inorganics Supervisor	Perth Inorganics, Wangara, WA
[redacted]	Laboratory Manager (Perth)	Perth Inorganics, Wangara, WA
[redacted]	Inorganics Analyst	Perth Inorganics, Wangara, WA
[redacted]	Senior Organic Chemist	Perth Organics, Wangara, WA

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.
- As per QWI – EN55-3 Data Interpreting Procedures, Ionic balances are typically calculated using Major Anions - Chloride, Alkalinity and Sulfate; and Major Cations - Calcium, Magnesium, Potassium and Sodium. Where applicable and dependent upon sample matrix, the Ionic Balance may also include the additional contribution of Ammonia, Dissolved Metals by ICPMS and H+ to the Cations and Nitrate, SiO2 and Fluoride to the Anions.
- Sodium Adsorption Ratio (where reported): Where results for Na, Ca or Mg are <LOR, a concentration at half the reported LOR is incorporated into the SAR calculation. This represents a conservative approach for Na relative to the assumption that <LOR = zero concentration and a conservative approach for Ca & Mg relative to the assumption that <LOR is equivalent to the LOR concentration.
- 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.
- ED045G: The presence of Thiocyanate, Thiosulfate and Sulfite can positively contribute to the chloride result, thereby may bias results higher than expected. Results should be scrutinised accordingly.

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW228_231211	0089_QC102_231211	0089_MW227_231211	0089_MW215_231211	0089_MW225_231211
				Sampling date / time	11-Dec-2023 09:25	11-Dec-2023 09:27	11-Dec-2023 10:36	11-Dec-2023 13:26	11-Dec-2023 14:44
Compound	CAS Number	LOR	Unit		EP2317555-001	EP2317555-002	EP2317555-003	EP2317555-005	EP2317555-006
					Result	Result	Result	Result	Result
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	<1	<1	<1	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	<1	<1	<1	<1
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		654	587	426	308	335
Total Alkalinity as CaCO3	---	1	mg/L		654	587	426	308	335
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		524	652	214	71	55
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		2820	4780	577	248	619
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		126	156	101	117	139
Magnesium	7439-95-4	1	mg/L		264	350	67	28	53
Sodium	7440-23-5	1	mg/L		1740	2560	369	120	278
Potassium	7440-09-7	1	mg/L		100	128	22	8	7
EN055: Ionic Balance									
ø Total Anions	---	0.01	meq/L		104	160	29.2	14.6	25.3
ø Total Cations	---	0.01	meq/L		106	151	27.2	13.6	23.6
ø Ionic Balance	---	0.01	%		1.30	2.86	3.68	3.76	3.54
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		0.25	0.28	<0.02	0.04	<0.02
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		0.21	0.21	<0.02	0.07	<0.02
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		0.49	0.56	<0.01	0.58	<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

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW228_231211	0089_QC102_231211	0089_MW227_231211	0089_MW215_231211	0089_MW225_231211
				Sampling date / time	11-Dec-2023 09:25	11-Dec-2023 09:27	11-Dec-2023 10:36	11-Dec-2023 13:26	11-Dec-2023 14:44
Compound	CAS Number	LOR	Unit		EP2317555-001	EP2317555-002	EP2317555-003	EP2317555-005	EP2317555-006
					Result	Result	Result	Result	Result
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		**1.2**	**1.1**	<0.1	<0.1	<0.1
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		**4.23**	**3.56**	<0.02	**0.03**	<0.02
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		**5.03**	**4.67**	<0.02	**0.10**	<0.02
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		**1.07**	**1.19**	<0.02	**0.02**	<0.02
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		**0.32**	**0.29**	<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
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									

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW228_231211	0089_QC102_231211	0089_MW227_231211	0089_MW215_231211	0089_MW225_231211
				Sampling date / time	11-Dec-2023 09:25	11-Dec-2023 09:27	11-Dec-2023 10:36	11-Dec-2023 13:26	11-Dec-2023 14:44
Compound	CAS Number	LOR	Unit		EP2317555-001	EP2317555-002	EP2317555-003	EP2317555-005	EP2317555-006
					Result	Result	Result	Result	Result
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
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		**1.02**	**0.85**	<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		**13.8**	**12.7**	<0.01	**0.84**	<0.01
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		**0.49**	**0.56**	<0.01	**0.58**	<0.01
Sum of PFAS (WA DER List)	---	0.01	µg/L		**13.6**	**12.5**	<0.01	**0.77**	<0.01
EP231S: PFAS Surrogate									
13C4-PFOS	---	0.02	%		**112**	**115**	**108**	**102**	**110**
13C8-PFOA	---	0.02	%		**106**	**99.1**	**98.3**	**96.4**	**97.5**

Surrogate Control Limits

Sub-Matrix: GROUNDWATER		Recovery Limits (%)	
Compound	CAS Number	Low	High
EP231S: PFAS Surrogate			
13C4-PFOS	---	65	140
13C8-PFOA	---	71	133

QUALITY CONTROL REPORT

Work Order	: **EP2317555**	Page	: 1 of 7
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: Customer Services EP
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: +61-8-9406 1301
Project	: WA_0089_PFASOMP_23	Date Samples Received	: 12-Dec-2023
Order number	: pfas-omp/Stirling	Date Analysis Commenced	: 13-Dec-2023
C-O-C number	: 61385	Issue Date	: 19-Dec-2023
Sampler	: [redacted]		
Site	: Stirling GW - AH		
Quote number	: SY/139/19 B		
No. of samples received	: 5		
No. of samples analysed	: 5		

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]	Inorganics Supervisor	Perth Inorganics, Wangara, WA
[redacted]	Laboratory Manager (Perth)	Perth Inorganics, Wangara, WA
[redacted]	Inorganics Analyst	Perth Inorganics, Wangara, WA
[redacted]	Senior Organic Chemist	Perth Organics, Wangara, WA

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 (%)*
ED037P: Alkalinity by PC Titrator (QC Lot: 5500016)									
EP2317554-002	Anonymous	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	147	147	0.0	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	147	147	0.0	0% - 20%
EP2317575-006	Anonymous	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	643	647	0.7	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	643	647	0.7	0% - 20%
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QC Lot: 5490438)									
EP2317554-001	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	2990	2980	0.1	0% - 20%
EP2317575-001	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	69	70	0.0	0% - 20%
ED045G: Chloride by Discrete Analyser (QC Lot: 5490439)									
EP2317554-001	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	22000	21900	0.4	0% - 20%
EP2317575-001	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	64	64	0.0	0% - 20%
ED093F: Dissolved Major Cations (QC Lot: 5490764)									
EP2317554-001	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	491	512	4.2	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	1590	1640	3.4	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	12800	13200	3.8	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	637	664	4.1	0% - 20%
EP2317555-003	0089_MW227_231211	ED093F Calcium	7440-70-2	1	mg/L	101	101	0.0	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	67	68	0.0	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	369	372	1.0	0% - 20%

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 (%)
ED093F: Dissolved Major Cations (QC Lot: 5490764) - continued									
EP2317555-003	0089_MW227_231211	ED093F: Potassium	7440-09-7	1	mg/L	22	22	0.0	0% - 20%
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 5493189)									
EP2317575-005	Anonymous	EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	1.33	1.31	1.3	0% - 20%
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	0.30	0.30	0.0	0% - 20%
		EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	0.14	0.14	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	0.14	0.14	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	0.04	0.05	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: 5493189)									
EP2317575-005	Anonymous	EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	0.14	0.13	8.4	0% - 50%
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	8.97	9.59	6.6	0% - 20%
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	7.67	7.44	3.0	0% - 20%
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	1.31	1.30	1.4	0% - 20%
		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	3.3	3.0	9.9	0% - 20%
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 5493189)									
EP2317575-005	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: 5493189)									
EP2317575-005	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

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: 5493189) - continued									
EP2317575-005	Anonymous	EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	1.30	1.31	0.0	0% - 20%
		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: 5493189)									
EP2317575-005	Anonymous	EP231X: Sum of PFAS	----	0.01	µg/L	24.6	24.7	0.3	0% - 20%
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	1.63	1.61	1.2	0% - 20%
		EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	24.5	24.5	0.2	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
ED037P: Alkalinity by PC Titrator (QCLot: 5500016)								
ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	---	---	---	---
ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	---	---	---	---
ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	<1	---	---	---	---
ED037-P: Total Alkalinity as CaCO3	---	1	mg/L	<1	20 mg/L	102	85.1	126
				<1	200 mg/L	102	90.5	111
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 5490438)								
ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<1	25 mg/L	98.9	89.9	112
				<1	500 mg/L	94.5	89.9	112
ED045G: Chloride by Discrete Analyser (QCLot: 5490439)								
ED045G: Chloride	16887-00-6	1	mg/L	<1	10 mg/L	97.5	88.6	113
				<1	1000 mg/L	97.0	88.6	113
ED093F: Dissolved Major Cations (QCLot: 5490764)								
ED093F: Calcium	7440-70-2	1	mg/L	<1	50 mg/L	102	86.5	117
ED093F: Magnesium	7439-95-4	1	mg/L	<1	50 mg/L	99.4	88.4	110
ED093F: Sodium	7440-23-5	1	mg/L	<1	50 mg/L	98.6	91.4	113
ED093F: Potassium	7440-09-7	1	mg/L	<1	50 mg/L	97.1	84.6	108
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5493189)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.2218 µg/L	101	72.0	130
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.2352 µg/L	94.6	71.0	127
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	0.2373 µg/L	90.4	68.0	131
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.238 µg/L	91.2	69.0	134
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.232 µg/L	92.7	65.0	140
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.241 µg/L	93.4	53.0	142
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5493189)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	1.25 µg/L	95.3	73.0	129
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	0.25 µg/L	122	72.0	129
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	0.25 µg/L	88.8	72.0	129
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	0.25 µg/L	96.2	72.0	130
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	0.25 µg/L	105	71.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	0.25 µg/L	103	69.0	130

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	LCS Recovery (%)	Acceptable Limits (%): Low	High
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5493189) - continued								
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	0.25 µg/L	118	71.0	129
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	0.25 µg/L	131	69.0	133
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	0.25 µg/L	118	72.0	134
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	0.25 µg/L	129	65.0	144
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	0.25 µg/L	98.2	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5493189)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.25 µg/L	113	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	125	60.5	138
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	0.625 µg/L	91.3	68.3	134
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	0.625 µg/L	104	62.2	138
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	0.25 µg/L	112	65.0	136
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	0.25 µg/L	93.8	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5493189)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.2343 µg/L	92.4	63.0	143
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	0.2378 µg/L	86.6	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	0.24 µg/L	104	67.0	138
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	0.241 µg/L	86.9	64.2	133
EP231P: PFAS Sums (QCLot: 5493189)								
EP231X: Sum of PFAS	---	0.01	µg/L	<0.01	---	---	---	---
EP231X: Sum of PFHxS and PFOS	355-46-4/17 63-23-1	0.01	µg/L	<0.01	---	---	---	---
EP231X: Sum of PFAS (WA DER List)	---	0.01	µg/L	<0.01	---	---	---	---

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	High
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 5490438)							
EP2317554-001	Anonymous						

Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 5490438) - continued							
EP2317554-001	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	100 mg/L	# Not Determined	70.4	130
ED045G: Chloride by Discrete Analyser (QCLot: 5490439)							
EP2317554-001	Anonymous	ED045G: Chloride	16887-00-6	200 mg/L	# Not Determined	70.0	130

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **EP2317555**	Page	: 1 of 5
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Telephone	: +61-8-9406 1301
Project	: WA_0089_PFASOMP_23	Date Samples Received	: 12-Dec-2023
Site	: Stirling GW - AH	Issue Date	: 19-Dec-2023
Sampler	: [redacted]	No. of samples received	: 5
Order number	: pfas-omp/Stirling	No. of samples analysed	: 5

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.**
- **Matrix Spike outliers exist - please see following pages for full details.**
- **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 : Quality Control Samples

Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

Matrix: **WATER**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
Matrix Spike (MS) Recoveries							
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA	EP2317554--001	Anonymous	**Sulfate as SO4 - Turbidimetric**	14808-79-8	Not Determined	---	**MS recovery not determined, background level greater than or equal to 4x spike level.**
ED045G: Chloride by Discrete Analyser	EP2317554--001	Anonymous	**Chloride**	16887-00-6	Not Determined	---	**MS recovery not determined, background level greater than or equal to 4x spike level.**

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	12	8.33	10.00	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)						
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	0	12	0.00	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*			*Analysis*		
			Date extracted	*Due for extraction*	*Evaluation*	*Date analysed*	*Due for analysis*	*Evaluation*
ED037P: Alkalinity by PC Titrator								
Clear Plastic Bottle - Natural (ED037-P)								
0089_MW228_231211,	0089_QC102_231211,	**11-Dec-2023**	---	---	---	**18-Dec-2023**	25-Dec-2023	✓
0089_MW227_231211,	0089_MW215_231211,							
0089_MW225_231211								
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA								
Clear Plastic Bottle - Natural (ED041G)								
0089_MW228_231211,	0089_QC102_231211,	**11-Dec-2023**	---	---	---	**19-Dec-2023**	08-Jan-2024	✓
0089_MW227_231211,	0089_MW215_231211,							
0089_MW225_231211								

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
ED045G: Chloride by Discrete Analyser							
Clear Plastic Bottle - Natural (ED045G)							
0089_MW228_231211, 0089_QC102_231211, 0089_MW227_231211, 0089_MW215_231211, 0089_MW225_231211	**11-Dec-2023**	**----**	----	----	**19-Dec-2023**	08-Jan-2024	✓
ED093F: Dissolved Major Cations							
Clear Plastic Bottle - Natural (ED093F)							
0089_MW228_231211, 0089_QC102_231211, 0089_MW227_231211, 0089_MW215_231211, 0089_MW225_231211	**11-Dec-2023**	**----**	----	----	**15-Dec-2023**	18-Dec-2023	✓
EP231A: Perfluoroalkyl Sulfonic Acids							
HDPE (no PTFE) (EP231X)							
0089_MW228_231211, 0089_QC102_231211, 0089_MW227_231211, 0089_MW215_231211, 0089_MW225_231211	**11-Dec-2023**	**14-Dec-2023**	08-Jun-2024	✓	**15-Dec-2023**	08-Jun-2024	✓
EP231B: Perfluoroalkyl Carboxylic Acids							
HDPE (no PTFE) (EP231X)							
0089_MW228_231211, 0089_QC102_231211, 0089_MW227_231211, 0089_MW215_231211, 0089_MW225_231211	**11-Dec-2023**	**14-Dec-2023**	08-Jun-2024	✓	**15-Dec-2023**	08-Jun-2024	✓
EP231C: Perfluoroalkyl Sulfonamides							
HDPE (no PTFE) (EP231X)							
0089_MW228_231211, 0089_QC102_231211, 0089_MW227_231211, 0089_MW215_231211, 0089_MW225_231211	**11-Dec-2023**	**14-Dec-2023**	08-Jun-2024	✓	**15-Dec-2023**	08-Jun-2024	✓
EP231D: (n:2) Fluorotelomer Sulfonic Acids							
HDPE (no PTFE) (EP231X)							
0089_MW228_231211, 0089_QC102_231211, 0089_MW227_231211, 0089_MW215_231211, 0089_MW225_231211	**11-Dec-2023**	**14-Dec-2023**	08-Jun-2024	✓	**15-Dec-2023**	08-Jun-2024	✓
EP231P: PFAS Sums							
HDPE (no PTFE) (EP231X)							
0089_MW228_231211, 0089_QC102_231211, 0089_MW227_231211, 0089_MW215_231211, 0089_MW225_231211	**11-Dec-2023**	**14-Dec-2023**	08-Jun-2024	✓	**15-Dec-2023**	08-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)							
Alkalinity by Auto Titrator	ED037-P	2	20	10.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	20	10.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	2	20	10.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	12	8.33	10.00	×	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	20	10.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Alkalinity by Auto Titrator	ED037-P	2	20	10.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	20	10.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	12	8.33	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	20	10.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Alkalinity by Auto Titrator	ED037-P	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	12	8.33	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Chloride by Discrete Analyser	ED045G	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	0	12	0.00	5.00	×	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	20	5.00	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
Alkalinity by Auto Titrator	ED037-P	WATER	In house: Referenced to APHA 2320 B This procedure determines alkalinity by automated measurement (e.g. PC Titrate) on a settled supernatant aliquot of the sample using pH 4.5 for indicating the total alkalinity end-point. This method is compliant with NEPM Schedule B(3)
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	WATER	In house: Referenced to APHA 4500-SO4. Dissolved sulfate is determined in a 0.45um filtered sample. Sulfate ions are converted to a barium sulfate suspension in an acetic acid medium with barium chloride. Light absorbance of the BaSO4 suspension is measured by a photometer and the SO4-2 concentration is determined by comparison of the reading with a standard curve. This method is compliant with NEPM Schedule B(3)
Chloride by Discrete Analyser	ED045G	WATER	In house: Referenced to APHA 4500 Cl - G.The thiocyanate ion is liberated from mercuric thiocyanate through sequestration of mercury by the chloride ion to form non-ionised mercuric chloride. In the presence of ferric ions the liberated thiocynate forms highly-coloured ferric thiocynate which is measured at 480 nm.
Major Cations - Dissolved	ED093F	WATER	In house: Referenced to APHA 3120 and 3125; USEPA SW 846 - 6010 and 6020; Cations are determined by either ICP-AES or ICP-MS techniques. This method is compliant with NEPM Schedule B(3) Sodium Adsorption Ratio is calculated from Ca, Mg and Na which determined by ALS in house method QWI-EN/ED093F. This method is compliant with NEPM Schedule B(3) Hardness parameters are calculated based on APHA 2340 B. This method is compliant with NEPM Schedule B(3)
Ionic Balance by PCT DA and Turbi SO4 DA	* EN055 - PG	WATER	In house: Referenced to APHA 1030F. This method is compliant with NEPM Schedule B(3)
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.

ALSCompass
SAMPLING *Intelligence*

ALS

Environmental Division
Perth
Work Order Reference
EP2317556

Telephone - 61-8-9406 1301

Custody Document for Submissions via ALS Compass App

Project: WA_COKE_PFASOMP_23 **Client:** Stantec **Project Manager:** [redacted]

Phone: [redacted]

ALS Compass COC Reference: 61376; 61375; 61385; 61380; 61387; 61383 **# Samples:** 2 Esky's **Sampler:** [redacted]

Phone: [redacted]

Turnaround Requirements: Standard / Urgent

Special Instructions:

Custody:

Relinquished by:	Received by:	Relinquished by:	Received by:
[redacted]	[redacted]		
Date / Time: 11/12/23	Date / Time: 12/12 12pm	Date / Time:	Date / Time:

CHAIN OF CUSTODY

ALS COC#: 61387 ALS Laboratory: EP Perth Environmental

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

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP_23

SITE: Stirling SD - AH

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES 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 Sediments SEDIMENT	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
001	0089_SD405		11/12/2023 09:35 AM	SOIL	ALS: 1 Non ALS: 0	No	X		
002	0089_QC105		11/12/2023 09:36 AM	SOIL	ALS: 1 Non ALS: 0	No	X		
003	0089_SD407		11/12/2023 10:50 AM	SOIL	ALS: 1 Non ALS: 0	No	X		
004	0089_SD409		11/12/2023 11:56 AM	SOIL	ALS: 1 Non ALS: 0	No	X		

CHAIN OF CUSTODY

COC#: 61387 *ALS Laboratory:* EP Perth Environmental

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

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP_23

SITE: Stirling SD - AH

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER:

CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO:

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	0089_SD405	HDPE Soil Jar	200 mL	00621122011084	Grey	No	
002	0089_QC105	HDPE Soil Jar	200 mL	00621122011119	Grey	No	
003	0089_SD407	HDPE Soil Jar	200 mL	00621122011192	Grey	No	
004	0089_SD409	HDPE Soil Jar	200 mL	00621122011063	Grey	No	

Total Bottle Count: ALS: 4, Non ALS: 0

SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : **EP2317556**

Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: Customer Services EP
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
E-mail	: [redacted]stantec.com	E-mail	: ALSEnviro.Perth@alsglobal.com
Telephone	: ----	Telephone	: +61-8-9406 1301
Facsimile	: ----	Facsimile	: +61-8-9406 1399
Project	: WA_0089_PFASOMP_23	Page	: 1 of 2
Order number	: pfas-omp/Stirling	Quote number	: ES2022MWHAUS0002 (SY/139/19 B)
C-O-C number	: 61387	QC Level	: NEPM 2013 B3 & ALS QC Standard
Site	: Stirling SD - AH		
Sampler	: [redacted] [redacted]		

Dates

Date Samples Received	: 12-Dec-2023 12:00	Issue Date	: 14-Dec-2023
Client Requested Due Date	: 19-Dec-2023	Scheduled Reporting Date	: **19-Dec-2023**

Delivery Details

Mode of Delivery	: Carrier	Security Seal	: Not Available
No. of coolers/boxes	: 2	Temperature	: 12.6
Receipt Detail	:	No. of samples received / analysed	: 4 / 4

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 see scanned COC for sample discrepencies: extra samples , samples not received etc.
- Please direct any queries related to sample condition / numbering / breakages to Sample Receipt (Samples.Perth@alsglobal.com)
- Analytical work for this work order will be conducted at ALS Environmental Perth.
- Please direct any turnaround / technical queries to the laboratory contact designated above.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months) from receipt of samples.
- **pH analysis should be conducted within 6 hours of sampling.**
- **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.**
- 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: **SOIL**

Laboratory sample ID	*Sampling date / time*	*Sample ID*	SOIL - EA055-103 Moisture Content	SOIL - EP231X (solids) PFAS - Full Suite (28 analytes)
EP2317556-001	11-Dec-2023 09:35	0089_SD405_231211	✓	✓
EP2317556-002	11-Dec-2023 09:36	0089_QC105_231211	✓	✓
EP2317556-003	11-Dec-2023 10:50	0089_SD407_231211	✓	✓
EP2317556-004	11-Dec-2023 11:56	0089_SD409_231211	✓	✓

Proactive Holding Time Report

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

Requested Deliverables

[redacted]
- A4 - AU Tax Invoice (INV) — Email — [redacted]cardno.com.au

DERP LAB REPORTS
- EDI Format - ESDAT (ESDAT) — Email — derp.labreports@esdat.com.au

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

CERTIFICATE OF ANALYSIS

Work Order	: **EP2317556**	Page	: 1 of 5
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: Customer Services EP
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: +61-8-9406 1301
Project	: WA_0089_PFASOMP_23	Date Samples Received	: 12-Dec-2023 12:00
Order number	: pfas-omp/Stirling	Date Analysis Commenced	: 13-Dec-2023
C-O-C number	: 61387	Issue Date	: 19-Dec-2023 12:34
Sampler	: [redacted]		
Site	: Stirling SD - AH		
Quote number	: SY/139/19 B		
No. of samples received	: 4		
No. of samples analysed	: 4		

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]	Laboratory Manager (Perth)	Perth Inorganics, Wangara, WA
[redacted]	Senior Organic Chemist	Perth Organics, Wangara, WA

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.

- 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: SEDIMENT (Matrix: SOIL)				Sample ID	0089_SD405_231211	0089_QC105_231211	0089_SD407_231211	0089_SD409_231211	----
				Sampling date / time	11-Dec-2023 09:35	11-Dec-2023 09:36	11-Dec-2023 10:50	11-Dec-2023 11:56	----
Compound	CAS Number	LOR	Unit		EP2317556-001	EP2317556-002	EP2317556-003	EP2317556-004	--------
					Result	Result	Result	Result	---
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content	---	0.1	%		19.0	27.0	26.0	29.6	----
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	----
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	----
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	----
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	----
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	----
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	----
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg		<0.001	<0.001	<0.001	<0.001	----
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	----
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	----
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	----
Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	----
Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	----
Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	----
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	----
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	----
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	----
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	----
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	----

Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)				Sample ID	0089_SD405_231211	0089_QC105_231211	0089_SD407_231211	0089_SD409_231211	----
				Sampling date / time	11-Dec-2023 09:35	11-Dec-2023 09:36	11-Dec-2023 10:50	11-Dec-2023 11:56	----
Compound	CAS Number	LOR	Unit		EP2317556-001	EP2317556-002	EP2317556-003	EP2317556-004	--------
					Result	Result	Result	Result	---
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	----
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	----
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	----
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	----
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	----
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	----
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	----
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	----
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	----
EP231P: PFAS Sums									
Sum of PFAS	---	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	----
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	----
Sum of PFAS (WA DER List)	---	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	----
EP231S: PFAS Surrogate									
13C4-PFOS	---	0.0002	%		**104**	**103**	**105**	**98.5**	----
13C8-PFOA	---	0.0002	%		**110**	**108**	**105**	**105**	----

Surrogate Control Limits

Sub-Matrix: **SEDIMENT**		Recovery Limits (%)	
Compound	*CAS Number*	*Low*	*High*
EP231S: PFAS Surrogate			
13C4-PFOS	---	76	136
13C8-PFOA	---	78	131

QUALITY CONTROL REPORT

Work Order	: **EP2317556**	Page	: 1 of 7
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: Customer Services EP
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: +61-8-9406 1301
Project	: WA_0089_PFASOMP_23	Date Samples Received	: 12-Dec-2023
Order number	: pfas-omp/Stirling	Date Analysis Commenced	: 13-Dec-2023
C-O-C number	: 61387	Issue Date	: 19-Dec-2023
Sampler	: [redacted]		
Site	: Stirling SD - AH		
Quote number	: SY/139/19 B		
No. of samples received	: 4		
No. of samples analysed	: 4		

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]	Laboratory Manager (Perth)	Perth Inorganics, Wangara, WA
[redacted]	Senior Organic Chemist	Perth Organics, Wangara, WA

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: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
EA055: Moisture Content (Dried @ 105-110°C) (QC Lot: 5491896)									
EP2317556-001	0089_SD405_231211	EA055: Moisture Content	----	0.1	%	19.0	20.3	6.3	0% - 20%
EP2317577-007	Anonymous	EA055: Moisture Content	----	0.1	%	34.6	34.6	0.0	0% - 20%
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 5490128)									
EP2317556-001	0089_SD405_231211	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
EP2317577-007	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	0.0002	0.0002	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 5490128)									
EP2317556-001	0089_SD405_231211	EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375 95 1	0 0002	mg/kg	0 0002	0 0002	0 0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit

Sub-Matrix: **SOIL**

				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: 5490128) - continued									
EP2317556-001	0089_SD405_231211	EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	<0.001	0.0	No Limit
EP2317577-007	Anonymous	EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	<0.001	0.0	No Limit
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 5490128)									
EP2317556 001	0089 SD405 231211	EP231X: Perfluorooctane sulfonamide (FOSA)	754 91 6	0 0002	mg/kg	0 0002	0 0002	0 0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151 50 2	0 0005	mg/kg	0 0005	0 0005	0 0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
EP2317577-007	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355 31 9	0 0002	mg/kg	0 0002	0 0002	0 0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit

Sub-Matrix: **SOIL**

				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: 5490128) - continued									
EP2317577-007	Anonymous	EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 5490128)									
EP2317556-001	0089_SD405_231211	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
EP2317577-007	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
EP231P: PFAS Sums (QC Lot: 5490128)									
EP2317556-001	0089_SD405_231211	EP231X: Sum of PFAS	----	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Sum of PFAS (WA DER List)	----	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
EP2317577-007	Anonymous	EP231X: Sum of PFAS	----	0.0002	mg/kg	0.0002	0.0002	0.0	No Limit
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg	0.0002	0.0002	0.0	No Limit
		EP231X: Sum of PFAS (WA DER List)	----	0.0002	mg/kg	0.0002	0.0002	0.0	No Limit

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: **SOIL**

				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: 5490128)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	0.0011 mg/kg	113	72.0	128
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	0.00125 mg/kg	98.8	73.0	123
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	0.00118 mg/kg	102	67.0	130
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	0.00119 mg/kg	105	70.0	132
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	0.00116 mg/kg	102	68.0	136
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	0.0012 mg/kg	106	59.0	134
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5490128)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	0.00625 mg/kg	111	71.0	135
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	0.00125 mg/kg	115	69.0	132
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	0.00125 mg/kg	116	70.0	132
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	0.00125 mg/kg	108	71.0	131
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	112	69.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	111	72.0	129
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	0.00125 mg/kg	122	69.0	133
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	118	64.0	136
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	98.4	69.0	135
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	104	66.0	139
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	0.00125 mg/kg	111	69.0	133
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5490128)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	0.00125 mg/kg	104	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	0.00312 mg/kg	102	59.6	143
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	0.00312 mg/kg	91.2	62.8	140
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	0.00312 mg/kg	114	61.5	139
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	0.00312 mg/kg	114	61.9	139
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	0.00125 mg/kg	116	63.0	144
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	0.00125 mg/kg	108	61.0	139
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5490128)								

Sub-Matrix: **SOIL**

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: 5490128) - continued								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	0.00117 mg/kg	116	62.0	145
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	0.00118 mg/kg	123	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	0.0012 mg/kg	106	65.0	137
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	0.0012 mg/kg	98.8	54.8	124
EP231P: PFAS Sums (QCLot: 5490128)								
EP231X: Sum of PFAS	---	0.0002	mg/kg	<0.0002	---	---	---	---
EP231X: Sum of PFHxS and PFOS	355-46-4/17 63-23-1	0.0002	mg/kg	<0.0002	---	---	---	---
EP231X: Sum of PFAS (WA DER List)	---	0.0002	mg/kg	<0.0002	---	---	---	---

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: **SOIL**

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: 5490128)							
EP2317556-002	0089_QC105_231211	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0011 mg/kg	104	72.0	128
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.00117 mg/kg	105	73.0	123
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.00118 mg/kg	99.2	67.0	130
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.00119 mg/kg	105	70.0	132
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.00116 mg/kg	94.5	68.0	136
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0012 mg/kg	97.4	59.0	134
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5490128)							
EP2317556-002	0089_QC105_231211	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.00625 mg/kg	105	71.0	135
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.00125 mg/kg	105	69.0	132
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.00125 mg/kg	112	70.0	132
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.00125 mg/kg	101	71.0	131
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.00125 mg/kg	104	69.0	133
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.00125 mg/kg	106	72.0	129
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.00125 mg/kg	109	69.0	133
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.00125 mg/kg	98.8	64.0	136
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.00125 mg/kg	114	69.0	135
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.00125 mg/kg	106	66.0	139
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.00125 mg/kg	107	69.0	133
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5490128)							

Sub-Matrix: **SOIL**

				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: 5490128) - continued							
EP2317556-002	0089_QC105_231211	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.00125 mg/kg	105	48.0	128
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.00312 mg/kg	99.5	60.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.00312 mg/kg	84.0	60.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.00312 mg/kg	101	60.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.00312 mg/kg	107	60.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.00125 mg/kg	118	63.0	144
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.00125 mg/kg	110	61.0	139
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5490128)							
EP2317556-002	0089_QC105_231211	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.00117 mg/kg	112	62.0	145
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.00118 mg/kg	109	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0012 mg/kg	102	65.0	137
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0012 mg/kg	101	60.0	130

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **EP2317556**	Page	: 1 of 4
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Telephone	: +61-8-9406 1301
Project	: WA_0089_PFASOMP_23	Date Samples Received	: 12-Dec-2023
Site	: Stirling SD - AH	Issue Date	: 19-Dec-2023
Sampler	: [redacted]	No. of samples received	: 4
Order number	: pfas-omp/Stirling	No. of samples analysed	: 4

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: **SOIL**

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
EA055: Moisture Content (Dried @ 105-110°C)								
HDPE Soil Jar (EA055)								
0089_SD405_231211,	0089_QC105_231211,	**11-Dec-2023**	**----**	----	----	**14-Dec-2023**	25-Dec-2023	✓
0089_SD407_231211,	0089_SD409_231211							
EP231A: Perfluoroalkyl Sulfonic Acids								
HDPE Soil Jar (EP231X)								
0089_SD405_231211,	0089_QC105_231211,	**11-Dec-2023**	**13-Dec-2023**	08-Jun-2024	✓	**14-Dec-2023**	22-Jan-2024	✓
0089_SD407_231211,	0089_SD409_231211							
EP231B: Perfluoroalkyl Carboxylic Acids								
HDPE Soil Jar (EP231X)								
0089_SD405_231211,	0089_QC105_231211,	**11-Dec-2023**	**13-Dec-2023**	08-Jun-2024	✓	**14-Dec-2023**	22-Jan-2024	✓
0089_SD407_231211,	0089_SD409_231211							
EP231C: Perfluoroalkyl Sulfonamides								
HDPE Soil Jar (EP231X)								
0089_SD405_231211,	0089_QC105_231211,	**11-Dec-2023**	**13-Dec-2023**	08-Jun-2024	✓	**14-Dec-2023**	22-Jan-2024	✓
0089_SD407_231211,	0089_SD409_231211							
EP231D: (n:2) Fluorotelomer Sulfonic Acids								
HDPE Soil Jar (EP231X)								
0089_SD405_231211,	0089_QC105_231211,	**11-Dec-2023**	**13-Dec-2023**	08-Jun-2024	✓	**14-Dec-2023**	22-Jan-2024	✓
0089_SD407_231211,	0089_SD409_231211							
EP231P: PFAS Sums								
HDPE Soil Jar (EP231X)								
0089_SD405_231211,	0089_QC105_231211,	**11-Dec-2023**	**13-Dec-2023**	08-Jun-2024	✓	**14-Dec-2023**	22-Jan-2024	✓
0089_SD407_231211,	0089_SD409_231211							

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: **SOIL**

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)							
Moisture Content	EA055	2	17	**11.76**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	20	**5.00**	**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
Moisture Content	EA055	SOIL	In house: A gravimetric procedure based on weight loss over a 12 hour drying period at 105-110 degrees C. This method is compliant with NEPM Schedule B(3).
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	SOIL	In-house: Analysis of soils by solvent extraction followed by LC-Electrospray-MS-MS, Negative Mode using MRM using internal standard quantitation. Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to a portion of soil which is then extracted with MTBE and an ion pairing reagent. A portion of extract is exchanged into the analytical solvent mixture, combined with an equal volume reagent water and 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
QuECheRS Extraction of Solids	* ORG71	SOIL	In house: Sequential extractions with Acetonitrile/Methanol by shaking. Extraction efficiency aided by the addition of salts under acidic conditions. Where relevant, interferences from co-extracted organics are removed with dispersive clean-up media (dSPE). The extract is either diluted or concentrated and exchanged into the analytical solvent.

ALSCompass
SAMPLING *Intelligence*

Environmental Division
Perth
Work Order Reference
EP2317575

Telephone +61-8-9406 1301

Custody Document for Submissions via ALS Compass App

Project: WA_COAST_PFASOMP_23 **Client:** Stantec **Project Manager:** [redacted]

Phone: [redacted]

ALS Compass COC Reference: 61376, 61375, 61385, 61380, 61387, 61383 **# Samples:** 2 Esks **Sampler:** [redacted]

Phone: [redacted]

Turnaround Requirements: ~~Standard~~ / Urgent

Special Instructions:

Custody:

Relinquished by:	Received by:	Relinquished by:	Received by:
[redacted]	[redacted]		
Date / Time: 11/12/23	Date / Time: 12/12 12pm	Date / Time:	Date / Time:

CHAIN OF CUSTODY

(ALS) COC#: **61360** *ALS Laboratory:* EP Perth Environmental

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

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP_23

SITE: Stirling GW - JS

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted]

QUOTE NO: SY/139/19 B

SAMPLER MOBILE: [redacted] / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES 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	Rinsate WATER	WA OMP Water Suite WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
001	0089_MW289		11/12/2023 08:05 AM	WATER	ALS: 5 Non ALS: 0	No		X		
002	0089_MW124		11/12/2023 09:35 AM	WATER	ALS: 5 Non ALS: 0	No		X		
003	0089_MW125		11/12/2023 10:38 AM	WATER	ALS: 3 Non ALS: 0	No		X		
004	0089_MW126		11/12/2023 12:06 PM	WATER	ALS: 3 Non ALS: 0	No		X		
005	0089_MW216		11/12/2023 02:37 PM	WATER	ALS: 5 Non ALS: 0	No		X		
006	0089_MW127		11/12/2023 02:59 PM	WATER	ALS: 3 Non ALS: 0	No		X		
007	0089_MW226		11/12/2023 02:59 PM	WATER	ALS: 3 Non ALS: 0	No		X		

CHAIN OF CUSTODY

COC#: 61360 ALS Laboratory: EP Perth Environmental

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

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP_23

SITE: Stirling GW - JS

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES 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	Rinsate WATER	WA OMP Water Suite WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
008	0089_CQ301		11/12/2023 03:12 PM	WATER	ALS: 2 Non ALS: 0	No	X			
009	0089_QC401		11/12/2023 03:12 PM	WATER	ALS: 2 Non ALS: 0	No	X			
010	0089_QC302		11/12/2023 03:13 PM	WATER	ALS: 2 Non ALS: 0	No	X			
011	0089_QC402		11/12/2023 03:14 PM	WATER	ALS: 2 Non ALS: 0	No	X			

CHAIN OF CUSTODY

COC#: 61360 ALS Laboratory: EP Perth Environmental

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

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP_23

SITE: Stirling GW - JS

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES 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	0089_MW289	Clear Plastic Bottle - Natural	125 mL	00070522229694	Green	No	
001	0089_MW289	HDPE (no PTFE)	20 mL	00352309067915	Grey	No	
001	0089_MW289	HDPE (no PTFE)	20 mL	00352309068075	Grey	No	
001	0089_MW289	HDPE (no PTFE)	20 mL	00352309068321	Grey	No	
001	0089_MW289	HDPE (no PTFE)	20 mL	00352309068354	Grey	No	
002	0089_MW124	Clear Plastic Bottle - Natural	125 mL	00070522229860	Green	No	
002	0089_MW124	HDPE (no PTFE)	20 mL	00352309068249	Grey	No	
002	0089_MW124	HDPE (no PTFE)	20 mL	00352309068066	Grey	No	
002	0089_MW124	HDPE (no PTFE)	20 mL	00352309068006	Grey	No	
002	0089_MW124	HDPE (no PTFE)	20 mL	00352309068285	Grey	No	
003	0089_MW125	Clear Plastic Bottle - Natural	125 mL	00070522229893	Green	No	
003	0089_MW125	HDPE (no PTFE)	20 mL	00352309068029	Grey	No	
003	0089_MW125	HDPE (no PTFE)	20 mL	00352309068155	Grey	No	
004	0089_MW126	Clear Plastic Bottle - Natural	125 mL	00070522229851	Green	No	
004	0089_MW126	HDPE (no PTFE)	20 mL	00352309068290	Grey	No	
004	0089_MW126	HDPE (no PTFE)	20 mL	00352309068225	Grey	No	
005	0089_MW216	HDPE (no PTFE)	20 mL	00352309068174	Grey	No	
005	0089_MW216	HDPE (no PTFE)	20 mL	00352309068031	Grey	No	
005	0089_MW216	Clear Plastic Bottle - Natural	125 mL	00070522229767	Green	No	
005	0089_MW216	HDPE (no PTFE)	20 mL	00352309068085	Grey	No	
005	0089_MW216	HDPE (no PTFE)	20 mL	00352309068176	Grey	No	
006	0089_MW127	Clear Plastic Bottle - Natural	125 mL	00070522229916	Green	No	
006	0089_MW127	HDPE (no PTFE)	20 mL	00352309067938	Grey	No	
006	0089_MW127	HDPE (no PTFE)	20 mL	00352309068000	Grey	No	
007	0089_MW226	HDPE (no PTFE)	20 mL	00352309068001	Grey	No	
007	0089_MW226	HDPE (no PTFE)	20 mL	00352309068282	Grey	No	

CHAIN OF CUSTODY

COC#: 61360 ALS Laboratory: EP Perth Environmental

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

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP_23

SITE: Stirling GW - JS

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO: [redacted]

TURNAROUND REQUIREMENTS : 5 Days

Bichazard 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:

007	0089_MW226	Clear Plastic Bottle - Natural	125 mL	0007052229591	Green	No	
008	0089_CQ301	HDPE (no PTFE)	20 mL	0035230906807 2	Grey	No	
008	0089_CQ301	HDPE (no PTFE)	20 mL	0035230906831 3	Grey	No	
009	0089_QC401	HDPE (no PTFE)	20 mL	0035230906833 9	Grey	No	
009	0089_QC401	HDPE (no PTFE)	20 mL	0035230906825 2	Grey	No	
010	0089_QC302	HDPE (no PTFE)	20 mL	0035230906831 7	Grey	No	
010	0089_QC302	HDPE (no PTFE)	20 mL	0035230906837 4	Grey	No	
011	0089_QC402	HDPE (no PTFE)	20 mL	0035230903008 3	Grey	No	
011	0089_QC402	HDPE (no PTFE)	20 mL	0035230906834 2	Grey	No	

Total Bottle Count: ALS: 35, Non ALS: 0

SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : **EP2317575**

Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: Customer Services EP
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
E-mail	: [redacted]stantec.com	E-mail	: ALSEnviro.Perth@alsglobal.com
Telephone	: ----	Telephone	: +61-8-9406 1301
Facsimile	: ----	Facsimile	: +61-8-9406 1399
Project	: WA_0089_PFASOMP_23	Page	: 1 of 2
Order number	: pfas-omp/Stirling	Quote number	: ES2022MWHAUS0002 (SY/139/19 B)
C-O-C number	: 61360	QC Level	: NEPM 2013 B3 & ALS QC Standard
Site	: Stirling GW - JS		
Sampler	: [redacted]		

Dates

Date Samples Received	: 12-Dec-2023 12:00	Issue Date	: 14-Dec-2023
Client Requested Due Date	: 19-Dec-2023	Scheduled Reporting Date	: **19-Dec-2023**

Delivery Details

Mode of Delivery	: Carrier	Security Seal	: Not Available
No. of coolers/boxes	: 2	Temperature	: 12.6 - Ice present
Receipt Detail	:	No. of samples received / analysed	: 11 / 11

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 see scanned COC for sample discrepencies: extra samples , samples not received etc.
- Please direct any queries related to sample condition / numbering / breakages to Sample Receipt (Samples.Perth@alsglobal.com)
- Analytical work for this work order will be conducted at ALS Environmental Perth.
- Please direct any turnaround / technical queries to the laboratory contact designated above.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months) from receipt of samples.
- **pH analysis should be conducted within 6 hours of sampling.**
- **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.**
- 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)	WATER - NT-01 & 02 Ca, Mg, Na, K, Cl, SO4, Alkalinity
EP2317575-001	11-Dec-2023 08:05	0089_MW289_231211	✓	✓
EP2317575-002	11-Dec-2023 09:35	0089_MW124_231211	✓	✓
EP2317575-003	11-Dec-2023 10:38	0089_MW125_231211	✓	✓
EP2317575-004	11-Dec-2023 12:06	0089_MW126_231211	✓	✓
EP2317575-005	11-Dec-2023 14:37	0089_MW216_231211	✓	✓
EP2317575-006	11-Dec-2023 14:59	0089_MW127_231211	✓	✓
EP2317575-007	11-Dec-2023 14:59	0089_MW226_231211	✓	✓
EP2317575-008	11-Dec-2023 15:12	0089_CQ301_231211	✓	
EP2317575-009	11-Dec-2023 15:12	0089_QC401_231211	✓	
EP2317575-010	11-Dec-2023 15:13	0089_QC302_231211	✓	
EP2317575-011	11-Dec-2023 15:14	0089_QC402_231211	✓	

Proactive Holding Time Report

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

Requested Deliverables

[redacted]
- A4 - AU Tax Invoice (INV) — Email — [redacted]cardno.com.au

DERP LAB REPORTS
- EDI Format - ESDAT (ESDAT) — Email — derp.labreports@esdat.com.au

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

CERTIFICATE OF ANALYSIS

Work Order	: **EP2317575**	Page	: 1 of 11
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: Customer Services EP
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: +61-8-9406 1301
Project	: WA_0089_PFASOMP_23	Date Samples Received	: 12-Dec-2023 12:00
Order number	: pfas-omp/Stirling	Date Analysis Commenced	: 13-Dec-2023
C-O-C number	: 61360	Issue Date	: 19-Dec-2023 21:10
Sampler	: [redacted]		
Site	: Stirling GW - JS		
Quote number	: SY/139/19 B		
No. of samples received	: 11		
No. of samples analysed	: 11		

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]	Laboratory Manager (Perth)	Perth Inorganics, Wangara, WA
[redacted]	Senior Organic Chemist	Perth Organics, Wangara, WA

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.
- As per QWI – EN55-3 Data Interpreting Procedures, Ionic balances are typically calculated using Major Anions - Chloride, Alkalinity and Sulfate; and Major Cations - Calcium, Magnesium, Potassium and Sodium. Where applicable and dependent upon sample matrix, the Ionic Balance may also include the additional contribution of Ammonia, Dissolved Metals by ICPMS and H+ to the Cations and Nitrate, SiO2 and Fluoride to the Anions.
- Sodium Adsorption Ratio (where reported): Where results for Na, Ca or Mg are <LOR, a concentration at half the reported LOR is incorporated into the SAR calculation. This represents a conservative approach for Na relative to the assumption that <LOR = zero concentration and a conservative approach for Ca & Mg relative to the assumption that <LOR is equivalent to the LOR concentration.
- 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.
- ED045G: The presence of Thiocyanate, Thiosulfate and Sulfite can positively contribute to the chloride result, thereby may bias results higher than expected. Results should be scrutinised accordingly.

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW289_231211	0089_MW124_231211	0089_MW125_231211	0089_MW126_231211	0089_MW216_231211
				Sampling date / time	11-Dec-2023 08:05	11-Dec-2023 09:35	11-Dec-2023 10:38	11-Dec-2023 12:06	11-Dec-2023 14:37
Compound	CAS Number	LOR	Unit		EP2317575-001	EP2317575-002	EP2317575-003	EP2317575-004	EP2317575-005
					Result	Result	Result	Result	Result
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	<1	<1	<1	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	<1	<1	<1	<1
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		378	416	402	661	267
Total Alkalinity as CaCO3	---	1	mg/L		378	416	402	661	267
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		69	2000	2050	1430	133
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		64	16600	16100	12900	511
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		101	455	419	342	136
Magnesium	7439-95-4	1	mg/L		30	1150	1060	962	49
Sodium	7440-23-5	1	mg/L		73	8980	8160	6780	270
Potassium	7440-09-7	1	mg/L		8	454	410	324	10
EN055: Ionic Balance									
ø Total Anions	---	0.01	meq/L		10.8	518	505	407	22.5
ø Total Cations	---	0.01	meq/L		10.9	520	474	399	22.8
ø Ionic Balance	---	0.01	%		0.44	0.13	3.20	0.92	0.66
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		0.03	<0.02	0.10	<0.02	0.14
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		0.04	<0.02	0.11	<0.02	0.14
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		0.41	<0.01	0.33	<0.01	1.33
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		0.03	<0.02	<0.02	<0.02	0.04
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		1.37	<0.01	<0.01	<0.01	0.30
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW289_231211	0089_MW124_231211	0089_MW125_231211	0089_MW126_231211	0089_MW216_231211
				Sampling date / time	11-Dec-2023 08:05	11-Dec-2023 09:35	11-Dec-2023 10:38	11-Dec-2023 12:06	11-Dec-2023 14:37
Compound	CAS Number	LOR	Unit		EP2317575-001	EP2317575-002	EP2317575-003	EP2317575-004	EP2317575-005
					Result	Result	Result	Result	Result
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		<0.1	<0.1	<0.1	<0.1	**3.3**
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	**8.97**
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		**0.05**	<0.02	**0.11**	<0.02	**7.67**
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	**1.31**
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		**0.05**	<0.01	<0.01	<0.01	**0.14**
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
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									

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW289_231211	0089_MW124_231211	0089_MW125_231211	0089_MW126_231211	0089_MW216_231211
				Sampling date / time	11-Dec-2023 08:05	11-Dec-2023 09:35	11-Dec-2023 10:38	11-Dec-2023 12:06	11-Dec-2023 14:37
Compound	CAS Number	LOR	Unit		EP2317575-001	EP2317575-002	EP2317575-003	EP2317575-004	EP2317575-005
					Result	Result	Result	Result	Result
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
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	**1.30**
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		**1.98**	<0.01	**0.65**	<0.01	**24.6**
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		**1.78**	<0.01	**0.33**	<0.01	**1.63**
Sum of PFAS (WA DER List)	---	0.01	µg/L		**1.91**	<0.01	**0.54**	<0.01	**24.5**
EP231S: PFAS Surrogate									
13C4-PFOS	---	0.02	%		**106**	**99.9**	**98.9**	**113**	**109**
13C8-PFOA	---	0.02	%		**108**	**103**	**109**	**99.9**	**103**

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW127_231211	0089_MW226_231211	----	----	----
				Sampling date / time	11-Dec-2023 14:59	11-Dec-2023 14:59	----	----	----
Compound	CAS Number	LOR	Unit		EP2317575-006	EP2317575-007	--------	--------	--------
					Result	Result	----	----	----
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	<1	----	----	----
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	21	----	----	----
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		643	116	----	----	----
Total Alkalinity as CaCO3	----	1	mg/L		643	137	----	----	----
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		1620	2950	----	----	----
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		15500	22000	----	----	----
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		347	512	----	----	----
Magnesium	7439-95-4	1	mg/L		1140	1620	----	----	----
Sodium	7440-23-5	1	mg/L		8270	13000	----	----	----
Potassium	7440-09-7	1	mg/L		402	658	----	----	----
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		484	685	----	----	----
ø Total Cations	----	0.01	meq/L		481	741	----	----	----
ø Ionic Balance	----	0.01	%		0.28	3.96	----	----	----
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		<0.01	<0.01	----	----	----
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		<0.01	<0.01	----	----	----
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	<0.02	----	----	----

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW127_231211	0089_MW226_231211	----	----	----
				Sampling date / time	11-Dec-2023 14:59	11-Dec-2023 14:59	----	----	----
Compound	CAS Number	LOR	Unit		EP2317575-006	EP2317575-007	--------	--------	--------
					Result	Result	—	—	—
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		<0.1	<0.1	----	----	----
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		<0.01	<0.01	----	----	----
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		<0.05	<0.05	----	----	----
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L		<0.02	<0.02	----	----	----
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L		<0.05	<0.05	----	----	----
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L		<0.05	<0.05	----	----	----
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L		<0.05	<0.05	----	----	----
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L		<0.05	<0.05	----	----	----
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L		<0.02	<0.02	----	----	----
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L		<0.02	<0.02	----	----	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids									

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW127_231211	0089_MW226_231211	----	----	----
				Sampling date / time	11-Dec-2023 14:59	11-Dec-2023 14:59	----	----	----
Compound	CAS Number	LOR	Unit		EP2317575-006	EP2317575-007	--------	--------	--------
					Result	Result	----	----	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L		<0.05	<0.05	----	----	----
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		<0.05	<0.05	----	----	----
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		<0.05	<0.05	----	----	----
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L		<0.05	<0.05	----	----	----
EP231P: PFAS Sums									
Sum of PFAS	---	0.01	µg/L		<0.01	<0.01	----	----	----
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		<0.01	<0.01	----	----	----
Sum of PFAS (WA DER List)	---	0.01	µg/L		<0.01	<0.01	----	----	----
EP231S: PFAS Surrogate									
13C4-PFOS	---	0.02	%		**109**	**94.7**	----	----	----
13C8-PFOA	---	0.02	%		**98.8**	**107**	----	----	----

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	0089_CQ301_231211	0089_QC401_231211	0089_QC302_231211	0089_QC402_231211	----
				Sampling date / time	11-Dec-2023 15:12	11-Dec-2023 15:12	11-Dec-2023 15:13	11-Dec-2023 15:14	----
Compound	CAS Number	LOR	Unit		EP2317575-008	EP2317575-009	EP2317575-010	EP2317575-011	--------
					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		<0.01	<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	----
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		<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	----
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		<0.02	<0.02	<0.02	<0.02	----
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
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	----

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	0089_CQ301_231211	0089_QC401_231211	0089_QC302_231211	0089_QC402_231211	----
				Sampling date / time	11-Dec-2023 15:12	11-Dec-2023 15:12	11-Dec-2023 15:13	11-Dec-2023 15:14	----
Compound	CAS Number	LOR	Unit		EP2317575-008	EP2317575-009	EP2317575-010	EP2317575-011	--------
					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	----
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		<0.01	<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	----
Sum of PFAS (WA DER List)	---	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	----
EP231S: PFAS Surrogate									
13C4-PFOS	---	0.02	%		**93.8**	**97.0**	**105**	**93.6**	----
13C8-PFOA	---	0.02	%		**110**	**103**	**102**	**101**	----

Surrogate Control Limits

Sub-Matrix: GROUNDWATER		Recovery Limits (%)	
Compound	CAS Number	Low	High
EP231S: PFAS Surrogate			
13C4-PFOS	---	65	140
13C8-PFOA	---	71	133

Sub-Matrix: WATER		Recovery Limits (%)	
Compound	CAS Number	Low	High
EP231S: PFAS Surrogate			
13C4-PFOS	---	65	140
13C8-PFOA	---	71	133

QUALITY CONTROL REPORT

Work Order	: **EP2317575**	Page	: 1 of 11
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: Customer Services EP
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: +61-8-9406 1301
Project	: WA_0089_PFASOMP_23	Date Samples Received	: 12-Dec-2023
Order number	: pfas-omp/Stirling	Date Analysis Commenced	: 13-Dec-2023
C-O-C number	: 61360	Issue Date	: 19-Dec-2023
Sampler	: [redacted]		
Site	: Stirling GW - JS		
Quote number	: SY/139/19 B		
No. of samples received	: 11		
No. of samples analysed	: 11		

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]	Laboratory Manager (Perth)	Perth Inorganics, Wangara, WA
[redacted]	Senior Organic Chemist	Perth Organics, Wangara, WA

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 (%)*
ED037P: Alkalinity by PC Titrator (QC Lot: 5500016)									
EP2317554-002	Anonymous	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	147	147	0.0	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	147	147	0.0	0% - 20%
EP2317575-006	0089_MW127_231211	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	643	647	0.7	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	643	647	0.7	0% - 20%
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QC Lot: 5490438)									
EP2317554-001	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	2990	2980	0.1	0% - 20%
EP2317575-001	0089_MW289_231211	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	69	70	0.0	0% - 20%
ED045G: Chloride by Discrete Analyser (QC Lot: 5490439)									
EP2317554-001	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	22000	21900	0.4	0% - 20%
EP2317575-001	0089_MW289_231211	ED045G: Chloride	16887-00-6	1	mg/L	64	64	0.0	0% - 20%
ED093F: Dissolved Major Cations (QC Lot: 5490764)									
EP2317554-001	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	491	512	4.2	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	1590	1640	3.4	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	12800	13200	3.8	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	637	664	4.1	0% - 20%
EP2317555-003	Anonymous	ED093F Calcium	7440-70-2	1	mg/L	101	101	0.0	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	67	68	0.0	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	369	372	1.0	0% - 20%

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 (%)
ED093F: Dissolved Major Cations (QC Lot: 5490764) - continued									
EP2317555-003	Anonymous	ED093F: Potassium	7440-09-7	1	mg/L	22	22	0.0	0% - 20%
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 5493189)									
EP2317575 005	0089 MW216 231211	EP231X: Perfluorohexane sulfonic acid (PFHxS)	355 46 4	0 01	µg/L	1 33	1 31	1 3	0% 20%
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	0.30	0.30	0.0	0% - 20%
		EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	0.14	0.14	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	0.14	0.14	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	0.04	0.05	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: 5493278)									
EP2317546-001	Anonymous	EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	0.18	0.19	0.0	0% - 50%
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	0.56	0.54	5.0	0% - 20%
		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
EP2317575-002	0089_MW124_231211	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
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 5493189)									
EP2317575-005	0089_MW216_231211	EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	0.14	0.13	8.4	0% - 50%
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	8.97	9.59	6.6	0% - 20%
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	7.67	7.44	3.0	0% - 20%
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	1.31	1.30	1.4	0% - 20%
		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	3.3	3.0	9.9	0% - 20%
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 5493278)									
EP2317546-001	Anonymous	EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	0.04	0.03	0.0	No Limit
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	0.03	0.03	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	0.17	0.17	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: 5493278) - continued									
EP2317546-001	Anonymous	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
EP2317575-002	0089_MW124_231211	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: 5493189)									
EP2317575-005	0089_MW216_231211	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: 5493278)									
EP2317546-001	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

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: 5493278) - continued									
EP2317546-001	Anonymous	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
EP2317575-002	0089_MW124_231211	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: 5493189)									
EP2317575-005	0089_MW216_231211	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	1.30	1.31	0.0	0% - 20%
		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: 5493278)									
EP2317546-001	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	0.06	0.06	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
EP2317575-002	0089_MW124_231211	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: 5493278) - continued									
EP2317575-002	0089_MW124_231211	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: 5493189)									
EP2317575-005	0089_MW216_231211	EP231X: Sum of PFAS	---	0.01	µg/L	24.6	24.7	0.3	0% - 20%
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	1.63	1.61	1.2	0% - 20%
		EP231X: Sum of PFAS (WA DER List)	---	0.01	µg/L	24.5	24.5	0.2	0% - 20%
EP231P: PFAS Sums (QC Lot: 5493278)									
EP2317546-001	Anonymous	EP231X: Sum of PFAS	---	0.01	µg/L	1.04	1.04	0.0	0% - 20%
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	0.74	0.73	1.4	0% - 20%
		EP231X: Sum of PFAS (WA DER List)	---	0.01	µg/L	1.04	1.02	1.9	0% - 20%
EP2317575-002	0089_MW124_231211	EP231X: Sum of PFAS	---	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Sum of PFAS (WA DER List)	---	0.01	µg/L	<0.01	<0.01	0.0	No Limit

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
ED037P: Alkalinity by PC Titrator (QCLot: 5500016)								
ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	---	---	---	---
ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	---	---	---	---
ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	<1	---	---	---	---
ED037-P: Total Alkalinity as CaCO3	---	1	mg/L	<1	20 mg/L	102	85.1	126
				<1	200 mg/L	102	90.5	111
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 5490438)								
ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<1	25 mg/L	98.9	89.9	112
				<1	500 mg/L	94.5	89.9	112
ED045G: Chloride by Discrete Analyser (QCLot: 5490439)								
ED045G: Chloride	16887-00-6	1	mg/L	<1	10 mg/L	97.5	88.6	113
				<1	1000 mg/L	97.0	88.6	113
ED093F: Dissolved Major Cations (QCLot: 5490764)								
ED093F: Calcium	7440-70-2	1	mg/L	<1	50 mg/L	102	86.5	117
ED093F: Magnesium	7439-95-4	1	mg/L	<1	50 mg/L	99.4	88.4	110
ED093F: Sodium	7440-23-5	1	mg/L	<1	50 mg/L	98.6	91.4	113
ED093F: Potassium	7440-09-7	1	mg/L	<1	50 mg/L	97.1	84.6	108
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5493189)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.2218 µg/L	101	72.0	130
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.2352 µg/L	94.6	71.0	127
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	0.2373 µg/L	90.4	68.0	131
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.238 µg/L	91.2	69.0	134
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.232 µg/L	92.7	65.0	140
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.241 µg/L	93.4	53.0	142
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5493278)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.2218 µg/L	104	72.0	130
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.2352 µg/L	119	71.0	127
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	0.2373 µg/L	96.7	68.0	131
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.238 µg/L	101	69.0	134
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.232 µg/L	87.3	65.0	140
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.241 µg/L	98.8	53.0	142

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: 5493189)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	1.25 µg/L	95.3	73.0	129
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	0.25 µg/L	122	72.0	129
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	0.25 µg/L	88.8	72.0	129
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	0.25 µg/L	96.2	72.0	130
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	0.25 µg/L	105	71.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	0.25 µg/L	103	69.0	130
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	0.25 µg/L	118	71.0	129
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	0.25 µg/L	131	69.0	133
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	0.25 µg/L	118	72.0	134
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	0.25 µg/L	129	65.0	144
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	0.25 µg/L	98.2	71.0	132
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5493278)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	1.25 µg/L	116	73.0	129
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	0.25 µg/L	105	72.0	129
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	0.25 µg/L	103	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	102	71.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	0.25 µg/L	97.8	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	116	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	105	65.0	144
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	0.25 µg/L	102	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5493189)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.25 µg/L	113	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	125	60.5	138
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	0.625 µg/L	91.3	68.3	134
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	0.625 µg/L	104	62.2	138
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	0.25 µg/L	112	65.0	136
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	0.25 µg/L	93.8	61.0	135

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: 5493278)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.25 µg/L	71.2	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	114	60.5	138
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	0.625 µg/L	92.2	68.3	134
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	0.625 µg/L	91.4	62.2	138
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	0.25 µg/L	104	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
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5493189)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.2343 µg/L	92.4	63.0	143
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	0.2378 µg/L	86.6	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	0.24 µg/L	104	67.0	138
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	0.241 µg/L	86.9	64.2	133
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5493278)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.2343 µg/L	109	63.0	143
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	0.2378 µg/L	102	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	0.24 µg/L	101	67.0	138
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	0.241 µg/L	86.1	64.2	133
EP231P: PFAS Sums (QCLot: 5493189)								
EP231X: Sum of PFAS	---	0.01	µg/L	<0.01	---	---	---	---
EP231X: Sum of PFHxS and PFOS	355-46-4/17 63-23-1	0.01	µg/L	<0.01	---	---	---	---
EP231X: Sum of PFAS (WA DER List)	---	0.01	µg/L	<0.01	---	---	---	---
EP231P: PFAS Sums (QCLot: 5493278)								
EP231X: Sum of PFAS	---	0.01	µg/L	<0.01	---	---	---	---
EP231X: Sum of PFHxS and PFOS	355-46-4/17 63-23-1	0.01	µg/L	<0.01	---	---	---	---
EP231X: Sum of PFAS (WA DER List)	---	0.01	µg/L	<0.01	---	---	---	---

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**

Matrix Spike (MS) Report

Sub-Matrix: **WATER**

Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report: Spike Concentration	Matrix Spike (MS) Report: SpikeRecovery(%) MS	Matrix Spike (MS) Report: Acceptable Limits (%) Low	Matrix Spike (MS) Report: Acceptable Limits (%) High
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 5490438)							
EP2317554-001	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	100 mg/L	# Not Determined	70.4	130
ED045G: Chloride by Discrete Analyser (QCLot: 5490439)							
EP2317554-001	Anonymous	ED045G: Chloride	16887-00-6	200 mg/L	# Not Determined	70.0	130
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5493278)							
EP2317575-001	0089_MW289_231211	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.2218 µg/L	102	72.0	129
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.232 µg/L	117	71.0	127
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.2352 µg/L	91.4	68.0	129
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.238 µg/L	92.2	69.0	134
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.232 µg/L	# Not Determined	65.0	140
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.241 µg/L	107	53.0	129
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5493278)							
EP2317575-001	0089_MW289_231211	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	1.25 µg/L	117	73.0	142
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.25 µg/L	106	72.0	129
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.25 µg/L	106	72.0	129
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.25 µg/L	103	72.0	130
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.25 µg/L	116	71.0	133
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.25 µg/L	99.2	69.0	130
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.25 µg/L	93.6	71.0	134
		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	89.2	72.0	134
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.25 µg/L	101	65.0	144
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.25 µg/L	103	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5493278)							
EP2317575-001	0089_MW289_231211	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.25 µg/L	68.8	59.0	135
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.625 µg/L	95.5	70.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.625 µg/L	86.2	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.625 µg/L	86.3	70.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.625 µg/L	98.5	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.25 µg/L	98.7	65.0	136
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.25 µg/L	98.6	61.0	135

Sub-Matrix: **WATER**

Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report: Spike Concentration	Matrix Spike (MS) Report: SpikeRecovery(%) MS	Matrix Spike (MS) Report: Acceptable Limits (%) Low	Matrix Spike (MS) Report: Acceptable Limits (%) High
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5493278)							
EP2317575-001	0089_MW289_231211	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.234 µg/L	113	63.0	143
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.2378 µg/L	100	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.24 µg/L	116	67.0	138
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.2415 µg/L	92.3	70.0	130

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **EP2317575**	Page	: 1 of 6
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Telephone	: +61-8-9406 1301
Project	: WA_0089_PFASOMP_23	Date Samples Received	: 12-Dec-2023
Site	: Stirling GW - JS	Issue Date	: 19-Dec-2023
Sampler	: [redacted]	No. of samples received	: 11
Order number	: pfas-omp/Stirling	No. of samples analysed	: 11

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.**
- **Matrix Spike outliers exist - please see following pages for full details.**
- **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 : Quality Control Samples

Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

Matrix: **WATER**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
Matrix Spike (MS) Recoveries							
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA	EP2317554--001	Anonymous	**Sulfate as SO4 - Turbidimetric**	14808-79-8	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
ED045G: Chloride by Discrete Analyser	EP2317554--001	Anonymous	**Chloride**	16887-00-6	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
EP231A: Perfluoroalkyl Sulfonic Acids	EP2317575--001	0089_MW289_231211	**Perfluorooctane sulfonic acid (PFOS)**	1763-23-1	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**

Outliers : Frequency of Quality Control Samples

Matrix: **WATER**

Quality Control Sample Type		Count		Rate (%)		Quality Control Specification
Analytical Methods	Method	QC	Regular	Actual	Expected	
Matrix Spikes (MS)						
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	27	3.70	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*			*Analysis*		
		Date extracted	*Due for extraction*	*Evaluation*	*Date analysed*	*Due for analysis*	*Evaluation*
ED037P: Alkalinity by PC Titrator							
Clear Plastic Bottle - Natural (ED037-P)							
0089_MW289_231211, 0089_MW124_231211, 0089_MW125_231211, 0089_MW126_231211, 0089_MW216_231211, 0089_MW127_231211, 0089_MW226_231211	**11-Dec-2023**	----	----	----	**18-Dec-2023**	25-Dec-2023	✓

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
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA							
Clear Plastic Bottle - Natural (ED041G)							
0089_MW289_231211, 0089_MW124_231211, 0089_MW125_231211, 0089_MW126_231211, 0089_MW216_231211, 0089_MW127_231211, 0089_MW226_231211	**11-Dec-2023**	**----**	----	----	**19-Dec-2023**	08-Jan-2024	✓
ED045G: Chloride by Discrete Analyser							
Clear Plastic Bottle - Natural (ED045G)							
0089_MW289_231211, 0089_MW124_231211, 0089_MW125_231211, 0089_MW126_231211, 0089_MW216_231211, 0089_MW127_231211, 0089_MW226_231211	**11-Dec-2023**	**----**	----	----	**19-Dec-2023**	08-Jan-2024	✓
ED093F: Dissolved Major Cations							
Clear Plastic Bottle - Natural (ED093F)							
0089_MW289_231211, 0089_MW124_231211, 0089_MW125_231211, 0089_MW126_231211, 0089_MW216_231211, 0089_MW127_231211, 0089_MW226_231211	**11-Dec-2023**	**----**	----	----	**15-Dec-2023**	18-Dec-2023	✓
EP231A: Perfluoroalkyl Sulfonic Acids							
HDPE (no PTFE) (EP231X)							
0089_MW289_231211, 0089_MW124_231211, 0089_MW125_231211, 0089_MW226_231211, 0089_CQ301_231211, 0089_QC401_231211, 0089_QC302_231211, 0089_QC402_231211	**11-Dec-2023**	**14-Dec-2023**	08-Jun-2024	✓	**14-Dec-2023**	08-Jun-2024	✓
HDPE (no PTFE) (EP231X)							
0089_MW126_231211, 0089_MW216_231211, 0089_MW127_231211	**11-Dec-2023**	**14-Dec-2023**	08-Jun-2024	✓	**15-Dec-2023**	08-Jun-2024	✓
EP231B: Perfluoroalkyl Carboxylic Acids							
HDPE (no PTFE) (EP231X)							
0089_MW289_231211, 0089_MW124_231211, 0089_MW125_231211, 0089_MW226_231211, 0089_CQ301_231211, 0089_QC401_231211, 0089_QC302_231211, 0089_QC402_231211	**11-Dec-2023**	**14-Dec-2023**	08-Jun-2024	✓	**14-Dec-2023**	08-Jun-2024	✓
HDPE (no PTFE) (EP231X)							
0089_MW126_231211, 0089_MW216_231211, 0089_MW127_231211	**11-Dec-2023**	**14-Dec-2023**	08-Jun-2024	✓	**15-Dec-2023**	08-Jun-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) 0089_MW289_231211, 0089_MW124_231211, 0089_MW125_231211, 0089_MW226_231211, 0089_CQ301_231211, 0089_QC401_231211, 0089_QC302_231211, 0089_QC402_231211	**11-Dec-2023**	**14-Dec-2023**	08-Jun-2024	✓	**14-Dec-2023**	08-Jun-2024	✓
HDPE (no PTFE) (EP231X) 0089_MW126_231211, 0089_MW216_231211, 0089_MW127_231211	**11-Dec-2023**	**14-Dec-2023**	08-Jun-2024	✓	**15-Dec-2023**	08-Jun-2024	✓
EP231D: (n:2) Fluorotelomer Sulfonic Acids							
HDPE (no PTFE) (EP231X) 0089_MW289_231211, 0089_MW124_231211, 0089_MW125_231211, 0089_MW226_231211, 0089_CQ301_231211, 0089_QC401_231211, 0089_QC302_231211, 0089_QC402_231211	**11-Dec-2023**	**14-Dec-2023**	08-Jun-2024	✓	**14-Dec-2023**	08-Jun-2024	✓
HDPE (no PTFE) (EP231X) 0089_MW126_231211, 0089_MW216_231211, 0089_MW127_231211	**11-Dec-2023**	**14-Dec-2023**	08-Jun-2024	✓	**15-Dec-2023**	08-Jun-2024	✓
EP231P: PFAS Sums							
HDPE (no PTFE) (EP231X) 0089_MW289_231211, 0089_MW124_231211, 0089_MW125_231211, 0089_MW226_231211, 0089_CQ301_231211, 0089_QC401_231211, 0089_QC302_231211, 0089_QC402_231211	**11-Dec-2023**	**14-Dec-2023**	08-Jun-2024	✓	**14-Dec-2023**	08-Jun-2024	✓
HDPE (no PTFE) (EP231X) 0089_MW126_231211, 0089_MW216_231211, 0089_MW127_231211	**11-Dec-2023**	**14-Dec-2023**	08-Jun-2024	✓	**15-Dec-2023**	08-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)							
Alkalinity by Auto Titrator	ED037-P	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	3	27	**11.11**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Alkalinity by Auto Titrator	ED037-P	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	27	**7.41**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Alkalinity by Auto Titrator	ED037-P	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	27	**7.41**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Chloride by Discrete Analyser	ED045G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	27	**3.70**	**5.00**	×	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	20	**5.00**	**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
Alkalinity by Auto Titrator	ED037-P	WATER	In house: Referenced to APHA 2320 B This procedure determines alkalinity by automated measurement (e.g. PC Titrate) on a settled supernatant aliquot of the sample using pH 4.5 for indicating the total alkalinity end-point. This method is compliant with NEPM Schedule B(3)
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	WATER	In house: Referenced to APHA 4500-SO4. Dissolved sulfate is determined in a 0.45um filtered sample. Sulfate ions are converted to a barium sulfate suspension in an acetic acid medium with barium chloride. Light absorbance of the BaSO4 suspension is measured by a photometer and the SO4-2 concentration is determined by comparison of the reading with a standard curve. This method is compliant with NEPM Schedule B(3)
Chloride by Discrete Analyser	ED045G	WATER	In house: Referenced to APHA 4500 Cl - G.The thiocyanate ion is liberated from mercuric thiocyanate through sequestration of mercury by the chloride ion to form non-ionised mercuric chloride. In the presence of ferric ions the liberated thiocynate forms highly-coloured ferric thiocynate which is measured at 480 nm.
Major Cations - Dissolved	ED093F	WATER	In house: Referenced to APHA 3120 and 3125; USEPA SW 846 - 6010 and 6020; Cations are determined by either ICP-AES or ICP-MS techniques. This method is compliant with NEPM Schedule B(3) Sodium Adsorption Ratio is calculated from Ca, Mg and Na which determined by ALS in house method QWI-EN/ED093F. This method is compliant with NEPM Schedule B(3) Hardness parameters are calculated based on APHA 2340 B. This method is compliant with NEPM Schedule B(3)
Ionic Balance by PCT DA and Turbi SO4 DA	* EN055 - PG	WATER	In house: Referenced to APHA 1030F. This method is compliant with NEPM Schedule B(3)
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.

ALSCompass
SAMPLING *Intelligence*

ALS

Environmental Division
Perth
Work Order Reference
EP2317576

Telephone - 61-8-9406 1301

Custody Document for Submissions via ALS Compass App

Project: WA_COAST_PFASMP_23 **Client:** Stantec **Project Manager:** [redacted]
Phone:

ALS Compass COC Reference: 61376/61375 **# Samples:** 2 Esky **Sampler:** [redacted]
61385; 61360; 61357; 61383 **Phone:**

Turnaround Requirements: Standard / Urgent

Special Instructions:

Custody:

Relinquished by:	Received by:	Relinquished by:	Received by:
[redacted]	[redacted]		
Date / Time: 11/12/23	Date / Time: 12/12 12pm	Date / Time:	Date / Time:

CHAIN OF CUSTODY

(ALS) COC#: 61375 *ALS Laboratory:* EP Perth Environmental

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

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP_23

SITE: Stirling SW/PW - JS

ORDER NO: pfas-omp/Stirling

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

PROJECT MANAGER [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES 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	WA OMP Water Suite WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
001	0089_SW130		11/12/2023 09:06 AM	WATER	ALS: 3 Non ALS: 0	No	X		
002	0089_PW335		11/12/2023 09:16 AM	WATER	ALS: 3 Non ALS: 0	No	X		
003	0089_PW364		11/12/2023 09:50 AM	WATER	ALS: 3 Non ALS: 0	No	X		
004	0089_QC106		11/12/2023 09:52 AM	WATER	ALS: 3 Non ALS: 0	No	X		
005	0089_SW132		11/12/2023 10:14 AM	WATER	ALS: 3 Non ALS: 0	No	X		
006	0089_QC107		11/12/2023 10:34 AM	WATER	ALS: 3 Non ALS: 0	No	X		
007	0089_PW340		11/12/2023 10:27 AM	WATER	ALS: 5 Non ALS: 0	No	X		

CHAIN OF CUSTODY

(ALS) COC#: 61375 ALS Laboratory: EP Perth Environmental

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

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP_23

SITE: Stirling SW/PW - JS

ORDER NO: pfas-omp/Stirling

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted]

QUOTE NO: SY/139/19 B

SAMPLER MOBILE: [redacted]

/ ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO:

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	WA OMP Water Suite WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
008	0089_PW362		11/12/2023 11:05 AM	WATER	ALS: 3 Non ALS: 0	No	X		
009	0089_PW341		11/12/2023 11:44 AM	WATER	ALS: 3 Non ALS: 0	No	X		
010	0089_SW134		11/12/2023 11:47 AM	WATER	ALS: 3 Non ALS: 0	No	X		
011	0089_PW363		11/12/2023 12:07 PM	WATER	ALS: 3 Non ALS: 0	No	X		
012	0089_PW306		11/12/2023 01:45 PM	WATER	ALS: 3 Non ALS: 0	No	X		
013	0089_SW309		11/12/2023 01:44 PM	WATER	ALS: 3 Non ALS: 0	No	X		
014	0089_PW314		11/12/2023 01:51 PM	WATER	ALS: 3 Non ALS: 0	No	X		

CHAIN OF CUSTODY

(ALS) COC#: 61375 *ALS Laboratory:* EP Perth Environmental

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

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP_23

SITE: Stirling SW/PW - JS

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES 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	WA OMP Water Suite WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
015	0089_PW315		11/12/2023 02:01 PM	WATER	ALS: 3 Non ALS: 0	No	X		
016	0089_SW310		11/12/2023 02:03 PM	WATER	ALS: 3 Non ALS: 0	No	X		
017	0089_PW307		11/12/2023 02:07 PM	WATER	ALS: 3 Non ALS: 0	No	X		
018	0089_PW316		11/12/2023 02:19 PM	WATER	ALS: 3 Non ALS: 0	No	X		
019	0089_PW308		11/12/2023 02:21 PM	WATER	ALS: 3 Non ALS: 0	No	X		
020	0089_SW311		11/12/2023 02:23 PM	WATER	ALS: 3 Non ALS: 0	No	X		

CHAIN OF CUSTODY

COC#: 61375 ALS Laboratory: EP Perth Environmental

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

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP_23

SITE: Stirling SW/PW - JS

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES 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	0089_SW130	Clear Plastic Bottle - Natural	125 mL	00070522229659	Green	No	
001	0089_SW130	HDPE (no PTFE)	20 mL	00352309068167	Grey	No	
001	0089_SW130	HDPE (no PTFE)	20 mL	00352309068156	Grey	No	
002	0089_PW335	Clear Plastic Bottle - Natural	125 mL	00070522229738	Green	No	
002	0089_PW335	HDPE (no PTFE)	20 mL	00352309067892	Grey	No	
002	0089_PW335	HDPE (no PTFE)	20 mL	00352309067883	Grey	No	
003	0089_PW364	Clear Plastic Bottle - Natural	125 mL	00070522229880	Green	No	
003	0089_PW364	HDPE (no PTFE)	20 mL	00352309068258	Grey	No	
003	0089_PW364	HDPE (no PTFE)	20 mL	00352309030044	Grey	No	
004	0089_QC106	Clear Plastic Bottle - Natural	125 mL	00070522229708	Green	No	
004	0089_QC106	HDPE (no PTFE)	20 mL	00352309067924	Grey	No	
004	0089_QC106	HDPE (no PTFE)	20 mL	00352309067986	Grey	No	
005	0089_SW132	Clear Plastic Bottle - Natural	125 mL	00070522229882	Green	No	
005	0089_SW132	HDPE (no PTFE)	20 mL	00352309067992	Grey	No	
005	0089_SW132	HDPE (no PTFE)	20 mL	00352309068190	Grey	No	
006	0089_QC107	Clear Plastic Bottle - Natural	125 mL	00070522229658	Green	No	
006	0089_QC107	HDPE (no PTFE)	20 mL	00352309068224	Grey	No	
006	0089_QC107	HDPE (no PTFE)	20 mL	00352309068372	Grey	No	
007	0089_PW340	HDPE (no PTFE)	20 mL	00352309030069	Grey	No	
007	0089_PW340	HDPE (no PTFE)	20 mL	00352309068305	Grey	No	
007	0089_PW340	Clear Plastic Bottle - Natural	125 mL	00070522229724	Green	No	
007	0089_PW340	HDPE (no PTFE)	20 mL	00352309068259	Grey	No	
007	0089_PW340	HDPE (no PTFE)	20 mL	00352309067993	Grey	No	
008	0089_PW362	Clear Plastic Bottle - Natural	125 mL	00070522229863	Green	No	
008	0089_PW362	HDPE (no PTFE)	20 mL	00352309067930	Grey	No	
008	0089_PW362	HDPE (no PTFE)	20 mL	00352309068023	Grey	No	

CHAIN OF CUSTODY

COC#: 61375 ALS Laboratory: EP Perth Environmental

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

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP_23

SITE: Stirling SW/PW - JS

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted]

QUOTE NO: SY/139/19 B

SAMPLER MOBILE: [redacted] / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES 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:

009	0089_PW341	Clear Plastic Bottle - Natural	125 mL	00070522229598	Green	No	
009	0089_PW341	HDPE (no PTFE)	20 mL	00352309068142	Grey	No	
009	0089_PW341	HDPE (no PTFE)	20 mL	00352309067880	Grey	No	
010	0089_SW134	HDPE (no PTFE)	20 mL	00352309067934	Grey	No	
010	0089_SW134	HDPE (no PTFE)	20 mL	00352309067972	Grey	No	
010	0089_SW134	Clear Plastic Bottle - Natural	125 mL	00070522229673	Green	No	
011	0089_PW363	HDPE (no PTFE)	20 mL	00352309067888	Grey	No	
011	0089_PW363	Clear Plastic Bottle - Natural	125 mL	00070522229835	Green	No	
011	0089_PW363	HDPE (no PTFE)	20 mL	00352309068089	Grey	No	
012	0089_PW306	Clear Plastic Bottle - Natural	125 mL	00070522229920	Green	No	
012	0089_PW306	HDPE (no PTFE)	20 mL	00352309068103	Grey	No	
012	0089_PW306	HDPE (no PTFE)	20 mL	00352309068065	Grey	No	
013	0089_SW309	Clear Plastic Bottle - Natural	125 mL	00070522229540	Green	No	
013	0089_SW309	HDPE (no PTFE)	20 mL	00352309067997	Grey	No	
013	0089_SW309	HDPE (no PTFE)	20 mL	00352309067941	Grey	No	
014	0089_PW314	Clear Plastic Bottle - Natural	125 mL	00070522229701	Green	No	
014	0089_PW314	HDPE (no PTFE)	20 mL	00352309067899	Grey	No	
014	0089_PW314	HDPE (no PTFE)	20 mL	00352309068057	Grey	No	
015	0089_PW315	Clear Plastic Bottle - Natural	125 mL	00070522229628	Green	No	
015	0089_PW315	HDPE (no PTFE)	20 mL	00352309068245	Grey	No	
015	0089_PW315	HDPE (no PTFE)	20 mL	00352309067995	Grey	No	
016	0089_SW310	Clear Plastic Bottle - Natural	125 mL	00070522229709	Green	No	
016	0089_SW310	HDPE (no PTFE)	20 mL	00352309068061	Grey	No	
016	0089_SW310	HDPE (no PTFE)	20 mL	00352309068396	Grey	No	
017	0089_PW307	Clear Plastic Bottle - Natural	125 mL	00070522229629	Green	No	
017	0089_PW307	HDPE (no PTFE)	20 mL	00352309068014	Grey	No	
017	0089_PW307	HDPE (no PTFE)	20 mL	00352309067886	Grey	No	

CHAIN OF CUSTODY

COC#: 61375 *ALS Laboratory:* EP Perth Environmental

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

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP_23

SITE: Stirling SW/PW - JS

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES 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:

018	0089_PW316	Clear Plastic Bottle - Natural	125 mL	00070522229959	Green	No	
018	0089_PW316	HDPE (no PTFE)	20 mL	00352309067931	Grey	No	
018	0089_PW316	HDPE (no PTFE)	20 mL	00352309067874	Grey	No	
019	0089_PW308	Clear Plastic Bottle - Natural	125 mL	00070522229781	Green	No	
019	0089_PW308	HDPE (no PTFE)	20 mL	00352309068175	Grey	No	
019	0089_PW308	HDPE (no PTFE)	20 mL	00352309068153	Grey	No	
020	0089_SW311	Clear Plastic Bottle - Natural	125 mL	00070522229681	Green	No	
020	0089_SW311	HDPE (no PTFE)	20 mL	00352309067906	Grey	No	
020	0089_SW311	HDPE (no PTFE)	20 mL	00352309067875	Grey	No	

Total Bottle Count: ALS: 62, Non ALS: 0

SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : **EP2317576**

Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: Customer Services EP
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
E-mail	: [redacted]stantec.com	E-mail	: ALSEnviro.Perth@alsglobal.com
Telephone	: ----	Telephone	: +61-8-9406 1301
Facsimile	: ----	Facsimile	: +61-8-9406 1399
Project	: WA_0089_PFASOMP_23	Page	: 1 of 3
Order number	: pfas-omp/Stirling	Quote number	: ES2022MWHAUS0002 (SY/139/19 B)
C-O-C number	: 61375	QC Level	: NEPM 2013 B3 & ALS QC Standard
Site	: Stirling SW/PW - JS		
Sampler	: [redacted]		

Dates

Date Samples Received	: 12-Dec-2023 12:00	Issue Date	: 14-Dec-2023
Client Requested Due Date	: 22-Dec-2023	Scheduled Reporting Date	: **22-Dec-2023**

Delivery Details

Mode of Delivery	: Carrier	Security Seal	: Not Available
No. of coolers/boxes	: 2	Temperature	: 12.6 - Ice present
Receipt Detail	:	No. of samples received / analysed	: 20 / 20

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 see scanned COC for sample discrepencies: extra samples , samples not received etc.
- Please direct any queries related to sample condition / numbering / breakages to Sample Receipt (Samples.Perth@alsglobal.com)
- Analytical work for this work order will be conducted at ALS Environmental Perth.
- Please direct any turnaround / technical queries to the laboratory contact designated above.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months) from receipt of samples.
- **pH analysis should be conducted within 6 hours of sampling.**
- **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.**
- 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)	WATER - NT-01 & 02 Ca, Mg, Na, K, Cl, SO4, Alkalinity
EP2317576-001	11-Dec-2023 09:06	0089_SW130_231211	✓	✓
EP2317576-002	11-Dec-2023 09:16	0089_PW335_231211	✓	✓
EP2317576-003	11-Dec-2023 09:50	0089_PW364_231211	✓	✓
EP2317576-004	11-Dec-2023 09:52	0089_QC106_231211	✓	✓
EP2317576-005	11-Dec-2023 10:14	0089_SW132_231211	✓	✓
EP2317576-006	11-Dec-2023 10:34	0089_QC107_231211	✓	✓
EP2317576-007	11-Dec-2023 10:27	0089_PW340_231211	✓	✓
EP2317576-008	11-Dec-2023 11:05	0089_PW362_231211	✓	✓
EP2317576-009	11-Dec-2023 11:44	0089_PW341_231211	✓	✓
EP2317576-010	11-Dec-2023 11:47	0089_SW134_231211	✓	✓
EP2317576-011	11-Dec-2023 12:07	0089_PW363_231211	✓	✓
EP2317576-012	11-Dec-2023 13:45	0089_PW306_231211	✓	✓
EP2317576-013	11-Dec-2023 13:44	0089_SW309_231211	✓	✓
EP2317576-014	11-Dec-2023 13:51	0089_PW314_231211	✓	✓
EP2317576-015	11-Dec-2023 14:01	0089_PW315_231211	✓	✓
EP2317576-016	11-Dec-2023 14:03	0089_SW310_231211	✓	✓
EP2317576-017	11-Dec-2023 14:07	0089_PW307_231211	✓	✓
EP2317576-018	11-Dec-2023 14:19	0089_PW316_231211	✓	✓
EP2317576-019	11-Dec-2023 14:21	0089_PW308_231211	✓	✓
EP2317576-020	11-Dec-2023 14:23	0089_SW311_231211	✓	✓

Proactive Holding Time Report

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

Requested Deliverables

[redacted]
- A4 - AU Tax Invoice (INV) — Email — [redacted]cardno.com.au

DERP LAB REPORTS
- EDI Format - ESDAT (ESDAT) — Email — derp.labreports@esdat.com.au

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

CERTIFICATE OF ANALYSIS

Work Order	: **EP2317576**	Page	: 1 of 18
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: Customer Services EP
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: +61-8-9406 1301
Project	: WA_0089_PFASOMP_23	Date Samples Received	: 12-Dec-2023 12:00
Order number	: pfas-omp/Stirling	Date Analysis Commenced	: 14-Dec-2023
C-O-C number	: 61375	Issue Date	: 22-Dec-2023 14:16
Sampler	: [redacted]		
Site	: Stirling SW/PW - JS		
Quote number	: SY/139/19 B		
No. of samples received	: 20		
No. of samples analysed	: 20		

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]	Inorganics Supervisor	Perth Inorganics, Wangara, WA
[redacted]	Senior Organic Chemist	Perth Organics, Wangara, WA

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.
- As per QWI – EN55-3 Data Interpreting Procedures, Ionic balances are typically calculated using Major Anions - Chloride, Alkalinity and Sulfate; and Major Cations - Calcium, Magnesium, Potassium and Sodium. Where applicable and dependent upon sample matrix, the Ionic Balance may also include the additional contribution of Ammonia, Dissolved Metals by ICPMS and H+ to the Cations and Nitrate, SiO2 and Fluoride to the Anions.
- Sodium Adsorption Ratio (where reported): Where results for Na, Ca or Mg are <LOR, a concentration at half the reported LOR is incorporated into the SAR calculation. This represents a conservative approach for Na relative to the assumption that <LOR = zero concentration and a conservative approach for Ca & Mg relative to the assumption that <LOR is equivalent to the LOR concentration.
- 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.
- ED045G: The presence of Thiocyanate, Thiosulfate and Sulfite can positively contribute to the chloride result, thereby may bias results higher than expected. Results should be scrutinised accordingly.

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_PW363_231211	0089_PW306_231211	0089_PW314_231211	0089_PW315_231211	0089_PW307_231211
				Sampling date / time	11-Dec-2023 12:07	11-Dec-2023 13:45	11-Dec-2023 13:51	11-Dec-2023 14:01	11-Dec-2023 14:07
Compound	CAS Number	LOR	Unit		EP2317576-011	EP2317576-012	EP2317576-014	EP2317576-015	EP2317576-017
					Result	Result	Result	Result	Result
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	<1	<1	<1	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	<1	<1	<1	<1
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		144	418	82	88	91
Total Alkalinity as CaCO3	---	1	mg/L		144	418	82	88	91
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		3040	2650	2760	2750	2900
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		22000	20400	20200	20000	19600
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		511	591	458	465	548
Magnesium	7439-95-4	1	mg/L		1660	1530	1470	1490	1620
Sodium	7440-23-5	1	mg/L		12900	11800	11400	11600	12200
Potassium	7440-09-7	1	mg/L		698	758	608	610	627
EN055: Ionic Balance									
ø Total Anions	---	0.01	meq/L		687	639	629	623	615
ø Total Cations	---	0.01	meq/L		741	688	655	666	707
ø Ionic Balance	---	0.01	%		3.80	3.70	2.05	3.32	6.98
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	0.05	<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

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_PW363_231211	0089_PW306_231211	0089_PW314_231211	0089_PW315_231211	0089_PW307_231211
				Sampling date / time	11-Dec-2023 12:07	11-Dec-2023 13:45	11-Dec-2023 13:51	11-Dec-2023 14:01	11-Dec-2023 14:07
Compound	CAS Number	LOR	Unit		EP2317576-011	EP2317576-012	EP2317576-014	EP2317576-015	EP2317576-017
					Result	Result	Result	Result	Result
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
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									

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_PW363_231211	0089_PW306_231211	0089_PW314_231211	0089_PW315_231211	0089_PW307_231211
				Sampling date / time	11-Dec-2023 12:07	11-Dec-2023 13:45	11-Dec-2023 13:51	11-Dec-2023 14:01	11-Dec-2023 14:07
Compound	CAS Number	LOR	Unit		EP2317576-011	EP2317576-012	EP2317576-014	EP2317576-015	EP2317576-017
					Result	Result	Result	Result	Result
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
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**	**0.05**	<0.01	<0.01	<0.01
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		**0.02**	**0.05**	<0.01	<0.01	<0.01
Sum of PFAS (WA DER List)	---	0.01	µg/L		**0.02**	**0.05**	<0.01	<0.01	<0.01
EP231S: PFAS Surrogate									
13C4-PFOS	---	0.02	%		**97.3**	**105**	**97.5**	**106**	**105**
13C8-PFOA	---	0.02	%		**102**	**96.0**	**101**	**98.9**	**110**

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_PW316_231211	0089_PW308_231211	----	----	----
				Sampling date / time	11-Dec-2023 14:19	11-Dec-2023 14:21	----	----	----
Compound	CAS Number	LOR	Unit		EP2317576-018	EP2317576-019	--------	--------	--------
					Result	Result	----	----	----
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	<1	----	----	----
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	<1	----	----	----
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		93	80	----	----	----
Total Alkalinity as CaCO3	----	1	mg/L		93	80	----	----	----
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		2930	2920	----	----	----
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		19800	19800	----	----	----
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		516	526	----	----	----
Magnesium	7439-95-4	1	mg/L		1530	1600	----	----	----
Sodium	7440-23-5	1	mg/L		11300	11900	----	----	----
Potassium	7440-09-7	1	mg/L		579	611	----	----	----
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		621	621	----	----	----
ø Total Cations	----	0.01	meq/L		658	691	----	----	----
ø Ionic Balance	----	0.01	%		2.86	5.35	----	----	----
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		<0.01	<0.01	----	----	----
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		<0.01	<0.01	----	----	----
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	<0.02	----	----	----

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_PW316_231211	0089_PW308_231211	----	----	----
				Sampling date / time	11-Dec-2023 14:19	11-Dec-2023 14:21	----	----	----
Compound	CAS Number	LOR	Unit		EP2317576-018	EP2317576-019	--------	--------	--------
					Result	Result	—	—	—
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		<0.1	<0.1	----	----	----
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		<0.01	<0.01	----	----	----
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		<0.05	<0.05	----	----	----
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L		<0.02	<0.02	----	----	----
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L		<0.05	<0.05	----	----	----
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L		<0.05	<0.05	----	----	----
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L		<0.05	<0.05	----	----	----
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L		<0.05	<0.05	----	----	----
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L		<0.02	<0.02	----	----	----
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L		<0.02	<0.02	----	----	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids									

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_PW316_231211	0089_PW308_231211	----	----	----
				Sampling date / time	11-Dec-2023 14:19	11-Dec-2023 14:21	----	----	----
Compound	CAS Number	LOR	Unit		EP2317576-018	EP2317576-019	--------	--------	--------
					Result	Result	----	----	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L		<0.05	<0.05	----	----	----
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		<0.05	<0.05	----	----	----
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		<0.05	<0.05	----	----	----
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L		<0.05	<0.05	----	----	----
EP231P: PFAS Sums									
Sum of PFAS	---	0.01	µg/L		<0.01	<0.01	----	----	----
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		<0.01	<0.01	----	----	----
Sum of PFAS (WA DER List)	---	0.01	µg/L		<0.01	<0.01	----	----	----
EP231S: PFAS Surrogate									
13C4-PFOS	---	0.02	%		**95.2**	**95.4**	----	----	----
13C8-PFOA	---	0.02	%		**102**	**95.3**	----	----	----

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_SW130_231211	0089_PW335_231211	0089_PW364_231211	0089_QC106_231211	0089_SW132_231211
				Sampling date / time	11-Dec-2023 09:06	11-Dec-2023 09:16	11-Dec-2023 09:50	11-Dec-2023 09:52	11-Dec-2023 10:14
Compound	CAS Number	LOR	Unit		EP2317576-001	EP2317576-002	EP2317576-003	EP2317576-004	EP2317576-005
					Result	Result	Result	Result	Result
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	<1	<1	<1	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	<1	<1	<1	<1
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		132	144	130	653	258
Total Alkalinity as CaCO3	---	1	mg/L		132	144	130	653	258
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		2740	2840	2880	2910	2710
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		20300	20900	21000	21200	20100
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		485	478	479	485	468
Magnesium	7439-95-4	1	mg/L		1560	1540	1550	1550	1500
Sodium	7440-23-5	1	mg/L		12100	12000	12000	12000	11600
Potassium	7440-09-7	1	mg/L		638	632	638	641	618
EN055: Ionic Balance									
ø Total Anions	---	0.01	meq/L		632	652	655	672	628
ø Total Cations	---	0.01	meq/L		695	689	690	690	667
ø Ionic Balance	---	0.01	%		4.74	2.77	2.59	1.36	2.98
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	0.01	0.01	0.01	0.10
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_SW130_231211	0089_PW335_231211	0089_PW364_231211	0089_QC106_231211	0089_SW132_231211
				Sampling date / time	11-Dec-2023 09:06	11-Dec-2023 09:16	11-Dec-2023 09:50	11-Dec-2023 09:52	11-Dec-2023 10:14
Compound	CAS Number	LOR	Unit		EP2317576-001	EP2317576-002	EP2317576-003	EP2317576-004	EP2317576-005
					Result	Result	Result	Result	Result
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
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									

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_SW130_231211	0089_PW335_231211	0089_PW364_231211	0089_QC106_231211	0089_SW132_231211
				Sampling date / time	11-Dec-2023 09:06	11-Dec-2023 09:16	11-Dec-2023 09:50	11-Dec-2023 09:52	11-Dec-2023 10:14
Compound	CAS Number	LOR	Unit		EP2317576-001	EP2317576-002	EP2317576-003	EP2317576-004	EP2317576-005
					Result	Result	Result	Result	Result
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
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**	**0.01**	**0.01**	**0.01**	**0.11**
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		**0.02**	**0.01**	**0.01**	**0.01**	**0.11**
Sum of PFAS (WA DER List)	---	0.01	µg/L		**0.02**	**0.01**	**0.01**	**0.01**	**0.11**
EP231S: PFAS Surrogate									
13C4-PFOS	---	0.02	%		**106**	**102**	**99.8**	**103**	**98.1**
13C8-PFOA	---	0.02	%		**113**	**104**	**96.4**	**112**	**115**

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_QC107_231211	0089_PW340_231211	0089_PW362_231211	0089_PW341_231211	0089_SW134_231211
				Sampling date / time	11-Dec-2023 10:34	11-Dec-2023 10:27	11-Dec-2023 11:05	11-Dec-2023 11:44	11-Dec-2023 11:47
Compound	CAS Number	LOR	Unit		EP2317576-006	EP2317576-007	EP2317576-008	EP2317576-009	EP2317576-010
					Result	Result	Result	Result	Result
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	<1	<1	<1	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	<1	<1	<1	<1
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		127	142	120	121	126
Total Alkalinity as CaCO3	---	1	mg/L		127	142	120	121	126
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		2760	2990	3060	3030	2820
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		20200	21500	21800	21700	20400
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		469	546	525	526	492
Magnesium	7439-95-4	1	mg/L		1500	1760	1710	1700	1590
Sodium	7440-23-5	1	mg/L		11600	13700	13200	13100	12300
Potassium	7440-09-7	1	mg/L		615	740	710	707	662
EN055: Ionic Balance									
ø Total Anions	---	0.01	meq/L		630	672	681	678	637
ø Total Cations	---	0.01	meq/L		667	787	759	754	707
ø Ionic Balance	---	0.01	%		2.88	7.91	5.43	5.34	5.26
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		0.06	0.02	0.01	0.02	0.02
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_QC107_231211	0089_PW340_231211	0089_PW362_231211	0089_PW341_231211	0089_SW134_231211
				Sampling date / time	11-Dec-2023 10:34	11-Dec-2023 10:27	11-Dec-2023 11:05	11-Dec-2023 11:44	11-Dec-2023 11:47
Compound	CAS Number	LOR	Unit		EP2317576-006	EP2317576-007	EP2317576-008	EP2317576-009	EP2317576-010
					Result	Result	Result	Result	Result
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
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									

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_QC107_231211	0089_PW340_231211	0089_PW362_231211	0089_PW341_231211	0089_SW134_231211
				Sampling date / time	11-Dec-2023 10:34	11-Dec-2023 10:27	11-Dec-2023 11:05	11-Dec-2023 11:44	11-Dec-2023 11:47
Compound	CAS Number	LOR	Unit		EP2317576-006	EP2317576-007	EP2317576-008	EP2317576-009	EP2317576-010
					Result	Result	Result	Result	Result
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
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		**0.07**	**0.02**	**0.01**	**0.02**	**0.02**
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		**0.07**	**0.02**	**0.01**	**0.02**	**0.02**
Sum of PFAS (WA DER List)	---	0.01	µg/L		**0.07**	**0.02**	**0.01**	**0.02**	**0.02**
EP231S: PFAS Surrogate									
13C4-PFOS	---	0.02	%		**96.8**	**97.5**	**102**	**105**	**96.5**
13C8-PFOA	---	0.02	%		**93.3**	**97.3**	**99.1**	**100**	**103**

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_SW309_231211	0089_SW310_231211	0089_SW311_231211	----	----
				Sampling date / time	11-Dec-2023 13:44	11-Dec-2023 14:03	11-Dec-2023 14:23	----	----
Compound	CAS Number	LOR	Unit		EP2317576-013	EP2317576-016	EP2317576-020	--------	--------
					Result	Result	Result	----	----
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	<1	<1	----	----
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	<1	<1	----	----
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		83	84	84	----	----
Total Alkalinity as CaCO3	----	1	mg/L		83	84	84	----	----
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		2730	2700	2900	----	----
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		20200	20100	19700	----	----
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		468	462	538	----	----
Magnesium	7439-95-4	1	mg/L		1490	1500	1600	----	----
Sodium	7440-23-5	1	mg/L		11500	11600	12000	----	----
Potassium	7440-09-7	1	mg/L		617	643	617	----	----
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		628	625	618	----	----
ø Total Cations	----	0.01	meq/L		662	668	696	----	----
ø Ionic Balance	----	0.01	%		2.61	3.30	5.97	----	----
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		<0.01	<0.01	<0.01	----	----
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	<0.02	<0.02	----	----

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)			Sample ID	0089_SW309_231211	0089_SW310_231211	0089_SW311_231211	----	----
			Sampling date / time	11-Dec-2023 13:44	11-Dec-2023 14:03	11-Dec-2023 14:23	----	----
Compound	CAS Number	LOR	Unit	EP2317576-013	EP2317576-016	EP2317576-020	--------	--------
				Result	Result	Result	----	----
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	----	----
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								

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_SW309_231211	0089_SW310_231211	0089_SW311_231211	----	----
				Sampling date / time	11-Dec-2023 13:44	11-Dec-2023 14:03	11-Dec-2023 14:23	----	----
Compound	CAS Number	LOR	Unit		EP2317576-013	EP2317576-016	EP2317576-020	--------	--------
					Result	Result	Result	----	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
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	<0.01	<0.01	----	----
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		<0.01	<0.01	<0.01	----	----
Sum of PFAS (WA DER List)	---	0.01	µg/L		<0.01	<0.01	<0.01	----	----
EP231S: PFAS Surrogate									
13C4-PFOS	---	0.02	%		**105**	**97.1**	**107**	----	----
13C8-PFOA	---	0.02	%		**94.4**	**101**	**91.8**	----	----

Surrogate Control Limits

Sub-Matrix: GROUNDWATER		Recovery Limits (%)	
Compound	CAS Number	Low	High
EP231S: PFAS Surrogate			
13C4-PFOS	---	65	140
13C8-PFOA	---	71	133

Sub-Matrix: SURFACE WATER		Recovery Limits (%)	
Compound	CAS Number	Low	High
EP231S: PFAS Surrogate			
13C4-PFOS	---	65	140
13C8-PFOA	---	71	133

QUALITY CONTROL REPORT

Work Order	: **EP2317576**	Page	: 1 of 8
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: Customer Services EP
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: +61-8-9406 1301
Project	: WA_0089_PFASOMP_23	Date Samples Received	: 12-Dec-2023
Order number	: pfas-omp/Stirling	Date Analysis Commenced	: 14-Dec-2023
C-O-C number	: 61375	Issue Date	: 22-Dec-2023
Sampler	: [redacted] [redacted]		
Site	: Stirling SW/PW - JS		
Quote number	: SY/139/19 B		
No. of samples received	: 20		
No. of samples analysed	: 20		

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]	Inorganics Supervisor	Perth Inorganics, Wangara, WA
[redacted]	Senior Organic Chemist	Perth Organics, Wangara, WA

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 (%)
ED037P: Alkalinity by PC Titrator (QC Lot: 5496429)									
EP2317576-002	0089_PW335_231211	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	144	144	0.0	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	144	144	0.0	0% - 20%
EP2317576-012	0089_PW306_231211	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	418	409	2.1	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	418	409	2.1	0% - 20%
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QC Lot: 5501007)									
EP2317576-001	0089_SW130_231211	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	2740	2760	0.7	0% - 20%
EP2317576-011	0089_PW363_231211	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	3040	3020	0.8	0% - 20%
ED045G: Chloride by Discrete Analyser (QC Lot: 5501008)									
EP2317576-001	0089_SW130_231211	ED045G: Chloride	16887-00-6	1	mg/L	20300	20100	1.2	0% - 20%
EP2317576-011	0089_PW363_231211	ED045G: Chloride	16887-00-6	1	mg/L	22000	21900	0.5	0% - 20%
ED093F: Dissolved Major Cations (QC Lot: 5493427)									
EP2317576-001	0089_SW130_231211	ED093F: Calcium	7440-70-2	1	mg/L	485	472	2.7	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	1560	1520	2.3	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	12100	11800	2.5	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	638	625	2.0	0% - 20%
EP2317576-011	0089_PW363_231211	ED093F Calcium	7440-70-2	1	mg/L	511	501	2.0	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	1660	1630	1.9	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	12900	12700	1.4	0% - 20%

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 (%)
ED093F: Dissolved Major Cations (QC Lot: 5493427) - continued									
EP2317576-011	0089_PW363_231211	ED093F: Potassium	7440-09-7	1	mg/L	698	684	2.1	0% - 20%
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 5496781)									
EP2317576-007	0089_PW340_231211	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	0.02	0.03	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
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 5496781)									
EP2317576-007	0089_PW340_231211	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: 5496781)									
EP2317576-007	0089_PW340_231211	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: 5496781)									
EP2317576-007	0089_PW340_231211	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: 5496781) - continued									
EP2317576-007	0089_PW340_231211	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: 5496781)									
EP2317576-007	0089_PW340_231211	EP231X: Sum of PFAS	----	0.01	µg/L	0.02	0.03	40.0	No Limit
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	0.02	0.03	40.0	No Limit
		EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	0.02	0.03	40.0	No Limit

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
ED037P: Alkalinity by PC Titrator (QCLot: 5496429)								
ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	---	---	---	---
ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	---	---	---	---
ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	<1	---	---	---	---
ED037-P: Total Alkalinity as CaCO3	---	1	mg/L	<1	20 mg/L	93.4	85.1	126
				<1	200 mg/L	95.3	90.5	111
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 5501007)								
ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<1	25 mg/L	102	89.9	112
				<1	500 mg/L	97.2	89.9	112
ED045G: Chloride by Discrete Analyser (QCLot: 5501008)								
ED045G: Chloride	16887-00-6	1	mg/L	<1	10 mg/L	97.8	88.6	113
				<1	1000 mg/L	96.5	88.6	113
ED093F: Dissolved Major Cations (QCLot: 5493427)								
ED093F: Calcium	7440-70-2	1	mg/L	<1	50 mg/L	104	86.5	117
ED093F: Magnesium	7439-95-4	1	mg/L	<1	50 mg/L	101	88.4	110
ED093F: Sodium	7440-23-5	1	mg/L	<1	50 mg/L	99.2	91.4	113
ED093F: Potassium	7440-09-7	1	mg/L	<1	50 mg/L	97.6	84.6	108
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5495898)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.2218 µg/L	103	72.0	130
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.2352 µg/L	100	71.0	127
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	0.2373 µg/L	92.5	68.0	131
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.238 µg/L	93.9	69.0	134
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.232 µg/L	87.1	65.0	140
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.241 µg/L	96.0	53.0	142
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5496781)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.2218 µg/L	95.4	72.0	130
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.2352 µg/L	94.4	71.0	127
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	0.2373 µg/L	87.2	68.0	131
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.238 µg/L	88.6	69.0	134
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.232 µg/L	86.4	65.0	140
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.241 µg/L	88.0	53.0	142

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: 5495898)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	1.25 µg/L	97.8	73.0	129
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	0.25 µg/L	114	72.0	129
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	0.25 µg/L	96.6	72.0	129
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	0.25 µg/L	99.2	72.0	130
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	0.25 µg/L	95.6	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	96.8	71.0	129
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	0.25 µg/L	110	69.0	133
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	0.25 µg/L	101	72.0	134
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	0.25 µg/L	112	65.0	144
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	0.25 µg/L	111	71.0	132
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5496781)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	1.25 µg/L	98.3	73.0	129
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	0.25 µg/L	111	72.0	129
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	0.25 µg/L	89.6	72.0	129
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	0.25 µg/L	89.6	72.0	130
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	0.25 µg/L	90.0	71.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	0.25 µg/L	79.4	69.0	130
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	0.25 µg/L	94.8	71.0	129
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	0.25 µg/L	89.6	69.0	133
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	0.25 µg/L	95.2	72.0	134
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	0.25 µg/L	88.8	65.0	144
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	0.25 µg/L	113	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5495898)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.25 µg/L	77.8	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	0.625 µg/L	103	68.0	141
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	0.625 µg/L	119	60.5	138
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	0.625 µg/L	99.7	68.3	134
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	0.625 µg/L	96.1	62.2	138
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	0.25 µg/L	97.0	65.0	136
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	0.25 µg/L	87.2	61.0	135

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: 5496781)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.25 µg/L	84.6	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	0.625 µg/L	104	68.0	141
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	0.625 µg/L	97.5	60.5	138
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	0.625 µg/L	101	68.3	134
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	0.625 µg/L	82.4	62.2	138
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	0.25 µg/L	95.6	65.0	136
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	0.25 µg/L	109	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5495898)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.2343 µg/L	94.1	63.0	143
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	0.2378 µg/L	95.9	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	0.24 µg/L	107	67.0	138
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	0.241 µg/L	87.1	64.2	133
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5496781)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.2343 µg/L	96.9	63.0	143
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	0.2378 µg/L	103	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	0.24 µg/L	87.5	67.0	138
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	0.241 µg/L	85.3	64.2	133
EP231P: PFAS Sums (QCLot: 5495898)								
EP231X: Sum of PFAS	---	0.01	µg/L	<0.01	---	---	---	---
EP231X: Sum of PFHxS and PFOS	355-46-4/17 63-23-1	0.01	µg/L	<0.01	---	---	---	---
EP231X: Sum of PFAS (WA DER List)	---	0.01	µg/L	<0.01	---	---	---	---
EP231P: PFAS Sums (QCLot: 5496781)								
EP231X: Sum of PFAS	---	0.01	µg/L	<0.01	---	---	---	---
EP231X: Sum of PFHxS and PFOS	355-46-4/17 63-23-1	0.01	µg/L	<0.01	---	---	---	---
EP231X: Sum of PFAS (WA DER List)	---	0.01	µg/L	<0.01	---	---	---	---

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**

Matrix Spike (MS) Report

Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*Concentration*	*MS*	*Low*	*High*
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 5501007)							
EP2317576-001	0089_SW130_231211	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	100 mg/L	# Not Determined	70.4	130
ED045G: Chloride by Discrete Analyser (QCLot: 5501008)							
EP2317576-001	0089_SW130_231211	ED045G: Chloride	16887-00-6	200 mg/L	# Not Determined	70.0	130

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **EP2317576**	Page	: 1 of 7
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Telephone	: +61-8-9406 1301
Project	: WA_0089_PFASOMP_23	Date Samples Received	: 12-Dec-2023
Site	: Stirling SW/PW - JS	Issue Date	: 22-Dec-2023
Sampler	: [redacted] [redacted]	No. of samples received	: 20
Order number	: pfas-omp/Stirling	No. of samples analysed	: 20

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.**
- **Matrix Spike outliers exist - please see following pages for full details.**
- **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 : Quality Control Samples

Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

Matrix: **WATER**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
Matrix Spike (MS) Recoveries							
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA	EP2317576--001	0089_SW130_231211	**Sulfate as SO4 - Turbidimetric**	14808-79-8	Not Determined	---	**MS recovery not determined, background level greater than or equal to 4x spike level.**
ED045G: Chloride by Discrete Analyser	EP2317576--001	0089_SW130_231211	**Chloride**	16887-00-6	Not Determined	---	**MS recovery not determined, background level greater than or equal to 4x spike level.**

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	21	4.76	10.00	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)						
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	0	21	0.00	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*			*Analysis*		
			Date extracted	*Due for extraction*	*Evaluation*	*Date analysed*	*Due for analysis*	*Evaluation*
ED037P: Alkalinity by PC Titrator								
Clear Plastic Bottle - Natural (ED037-P)								
0089_SW130_231211,	0089_PW335_231211,	**11-Dec-2023**	---	---	---	**16-Dec-2023**	25-Dec-2023	✓
0089_PW364_231211,	0089_QC106_231211,							
0089_SW132_231211,	0089_QC107_231211,							
0089_PW340_231211,	0089_PW362_231211,							
0089_PW341_231211,	0089_SW134_231211,							
0089_PW363_231211,	0089_PW306_231211,							
0089_SW309_231211,	0089_PW314_231211,							
0089_PW315_231211,	0089_SW310_231211,							
0089_PW307_231211,	0089_PW316_231211,							
0089_PW308_231211,	0089_SW311_231211							

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
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA								
Clear Plastic Bottle - Natural (ED041G)								
0089_SW130_231211,	0089_PW335_231211,	**11-Dec-2023**	**----**	----	----	**22-Dec-2023**	08-Jan-2024	✓
0089_PW364_231211,	0089_QC106_231211,							
0089_SW132_231211,	0089_QC107_231211,							
0089_PW340_231211,	0089_PW362_231211,							
0089_PW341_231211,	0089_SW134_231211,							
0089_PW363_231211,	0089_PW306_231211,							
0089_SW309_231211,	0089_PW314_231211,							
0089_PW315_231211,	0089_SW310_231211,							
0089_PW307_231211,	0089_PW316_231211,							
0089_PW308_231211,	0089_SW311_231211							
ED045G: Chloride by Discrete Analyser								
Clear Plastic Bottle - Natural (ED045G)								
0089_SW130_231211,	0089_PW335_231211,	**11-Dec-2023**	**----**	----	----	**22-Dec-2023**	08-Jan-2024	✓
0089_PW364_231211,	0089_QC106_231211,							
0089_SW132_231211,	0089_QC107_231211,							
0089_PW340_231211,	0089_PW362_231211,							
0089_PW341_231211,	0089_SW134_231211,							
0089_PW363_231211,	0089_PW306_231211,							
0089_SW309_231211,	0089_PW314_231211,							
0089_PW315_231211,	0089_SW310_231211,							
0089_PW307_231211,	0089_PW316_231211,							
0089_PW308_231211,	0089_SW311_231211							
ED093F: Dissolved Major Cations								
Clear Plastic Bottle - Natural (ED093F)								
0089_SW130_231211,	0089_PW335_231211,	**11-Dec-2023**	**----**	----	----	**18-Dec-2023**	18-Dec-2023	✓
0089_PW364_231211,	0089_QC106_231211,							
0089_SW132_231211,	0089_QC107_231211,							
0089_PW340_231211,	0089_PW362_231211,							
0089_PW341_231211,	0089_SW134_231211,							
0089_PW363_231211,	0089_PW306_231211,							
0089_SW309_231211,	0089_PW314_231211,							
0089_PW315_231211,	0089_SW310_231211,							
0089_PW307_231211,	0089_PW316_231211,							
0089_PW308_231211,	0089_SW311_231211							

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)							
0089_PW307_231211	**11-Dec-2023**	**15-Dec-2023**	08-Jun-2024	✓	**15-Dec-2023**	08-Jun-2024	✓
HDPE (no PTFE) (EP231X)							
0089_SW130_231211, 0089_PW335_231211, 0089_PW364_231211, 0089_QC106_231211, 0089_SW132_231211, 0089_QC107_231211, 0089_PW340_231211, 0089_PW362_231211, 0089_PW341_231211, 0089_SW134_231211, 0089_PW363_231211, 0089_PW306_231211, 0089_SW309_231211, 0089_PW314_231211, 0089_PW315_231211, 0089_SW310_231211, 0089_PW316_231211, 0089_PW308_231211, 0089_SW311_231211	**11-Dec-2023**	**15-Dec-2023**	08-Jun-2024	✓	**18-Dec-2023**	08-Jun-2024	✓
EP231B: Perfluoroalkyl Carboxylic Acids							
HDPE (no PTFE) (EP231X)							
0089_PW307_231211	**11-Dec-2023**	**15-Dec-2023**	08-Jun-2024	✓	**15-Dec-2023**	08-Jun-2024	✓
HDPE (no PTFE) (EP231X)							
0089_SW130_231211, 0089_PW335_231211, 0089_PW364_231211, 0089_QC106_231211, 0089_SW132_231211, 0089_QC107_231211, 0089_PW340_231211, 0089_PW362_231211, 0089_PW341_231211, 0089_SW134_231211, 0089_PW363_231211, 0089_PW306_231211, 0089_SW309_231211, 0089_PW314_231211, 0089_PW315_231211, 0089_SW310_231211, 0089_PW316_231211, 0089_PW308_231211, 0089_SW311_231211	**11-Dec-2023**	**15-Dec-2023**	08-Jun-2024	✓	**18-Dec-2023**	08-Jun-2024	✓
EP231C: Perfluoroalkyl Sulfonamides							
HDPE (no PTFE) (EP231X)							
0089_PW307_231211	**11-Dec-2023**	**15-Dec-2023**	08-Jun-2024	✓	**15-Dec-2023**	08-Jun-2024	✓
HDPE (no PTFE) (EP231X)							
0089_SW130_231211, 0089_PW335_231211, 0089_PW364_231211, 0089_QC106_231211, 0089_SW132_231211, 0089_QC107_231211, 0089_PW340_231211, 0089_PW362_231211, 0089_PW341_231211, 0089_SW134_231211, 0089_PW363_231211, 0089_PW306_231211, 0089_SW309_231211, 0089_PW314_231211, 0089_PW315_231211, 0089_SW310_231211, 0089_PW316_231211, 0089_PW308_231211, 0089_SW311_231211	**11-Dec-2023**	**15-Dec-2023**	08-Jun-2024	✓	**18-Dec-2023**	08-Jun-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)							
0089_PW307_231211	**11-Dec-2023**	**15-Dec-2023**	08-Jun-2024	✓	**15-Dec-2023**	08-Jun-2024	✓
HDPE (no PTFE) (EP231X)							
0089_SW130_231211, 0089_PW335_231211, 0089_PW364_231211, 0089_QC106_231211, 0089_SW132_231211, 0089_QC107_231211, 0089_PW340_231211, 0089_PW362_231211, 0089_PW341_231211, 0089_SW134_231211, 0089_PW363_231211, 0089_PW306_231211, 0089_SW309_231211, 0089_PW314_231211, 0089_PW315_231211, 0089_SW310_231211, 0089_PW316_231211, 0089_PW308_231211, 0089_SW311_231211	**11-Dec-2023**	**15-Dec-2023**	08-Jun-2024	✓	**18-Dec-2023**	08-Jun-2024	✓
EP231P: PFAS Sums							
HDPE (no PTFE) (EP231X)							
0089_PW307_231211	**11-Dec-2023**	**15-Dec-2023**	08-Jun-2024	✓	**15-Dec-2023**	08-Jun-2024	✓
HDPE (no PTFE) (EP231X)							
0089_SW130_231211, 0089_PW335_231211, 0089_PW364_231211, 0089_QC106_231211, 0089_SW132_231211, 0089_QC107_231211, 0089_PW340_231211, 0089_PW362_231211, 0089_PW341_231211, 0089_SW134_231211, 0089_PW363_231211, 0089_PW306_231211, 0089_SW309_231211, 0089_PW314_231211, 0089_PW315_231211, 0089_SW310_231211, 0089_PW316_231211, 0089_PW308_231211, 0089_SW311_231211	**11-Dec-2023**	**15-Dec-2023**	08-Jun-2024	✓	**18-Dec-2023**	08-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)							
Alkalinity by Auto Titrator	ED037-P	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	21	**4.76**	**10.00**	×	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Alkalinity by Auto Titrator	ED037-P	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	21	**9.52**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Alkalinity by Auto Titrator	ED037-P	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	21	**9.52**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Chloride by Discrete Analyser	ED045G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	0	21	**0.00**	**5.00**	×	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	20	**5.00**	**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
Alkalinity by Auto Titrator	ED037-P	WATER	In house: Referenced to APHA 2320 B This procedure determines alkalinity by automated measurement (e.g. PC Titrate) on a settled supernatant aliquot of the sample using pH 4.5 for indicating the total alkalinity end-point. This method is compliant with NEPM Schedule B(3)
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	WATER	In house: Referenced to APHA 4500-SO4. Dissolved sulfate is determined in a 0.45um filtered sample. Sulfate ions are converted to a barium sulfate suspension in an acetic acid medium with barium chloride. Light absorbance of the BaSO4 suspension is measured by a photometer and the SO4-2 concentration is determined by comparison of the reading with a standard curve. This method is compliant with NEPM Schedule B(3)
Chloride by Discrete Analyser	ED045G	WATER	In house: Referenced to APHA 4500 Cl - G.The thiocyanate ion is liberated from mercuric thiocyanate through sequestration of mercury by the chloride ion to form non-ionised mercuric chloride. In the presence of ferric ions the liberated thiocynate forms highly-coloured ferric thiocynate which is measured at 480 nm.
Major Cations - Dissolved	ED093F	WATER	In house: Referenced to APHA 3120 and 3125; USEPA SW 846 - 6010 and 6020; Cations are determined by either ICP-AES or ICP-MS techniques. This method is compliant with NEPM Schedule B(3) Sodium Adsorption Ratio is calculated from Ca, Mg and Na which determined by ALS in house method QWI-EN/ED093F. This method is compliant with NEPM Schedule B(3) Hardness parameters are calculated based on APHA 2340 B. This method is compliant with NEPM Schedule B(3)
Ionic Balance by PCT DA and Turbi SO4 DA	* EN055 - PG	WATER	In house: Referenced to APHA 1030F. This method is compliant with NEPM Schedule B(3)
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.

ALSCompass
SAMPLING *Intelligence*

Environmental Division
Perth
Work Order Reference
EP2317577

Telephone +61-8-9406 1301

Custody Document for Submissions via ALS Compass App

Project: WA_COAST_PFASMP_23 **Client:** Stantec **Project Manager:** [redacted]

Phone: [redacted]

ALS Compass COC Reference: 61376, 61375, 61385, 61380, 61387, 61383 **# Samples:** 2 Bottles **Sampler:** [redacted]

Phone: [redacted]

Turnaround Requirements: Standard / Urgent

Special Instructions:

Custody:

Relinquished by:	Received by:	Relinquished by:	Received by:
[redacted]	[redacted]		
Date / Time: 11/12/23	Date / Time: 12/12 12pm	Date / Time:	Date / Time:

CHAIN OF CUSTODY

ALS COC#: 61376 ALS Laboratory: EP Perth Environmental

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

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP_23

SITE: Stirling SD - JS

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES 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 Sediments SEDIMENT	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
001	0089_SD335		11/12/2023 09:19 AM	SOIL	ALS: 1 Non ALS: 0	No	X		
002	0089_QC101		11/12/2023 09:19 AM	SOIL	ALS: 1 Non ALS: 0	No	X		
003	0089_SD364		11/12/2023 09:54 AM	SOIL	ALS: 1 Non ALS: 0	No	X		
004	0089_SD340		11/12/2023 10:35 AM	SOIL	ALS: 1 Non ALS: 0	No	X		
005	0089_SD362		11/12/2023 11:06 AM	SOIL	ALS: 1 Non ALS: 0	No	X		
006	0089_SD341		11/12/2023 11:47 AM	SOIL	ALS: 1 Non ALS: 0	No	X		
007	0089_SD363		11/12/2023 12:06 PM	SOIL	ALS: 1 Non ALS: 0	No	X		

CHAIN OF CUSTODY

ALS COC#: 61376 ALS Laboratory: EP Perth Environmental

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

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP_23

SITE: Stirling SD - JS

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES 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 Sediments SEDIMENT	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
008	0089_SD306		11/12/2023 01:52 PM	SOIL	ALS: 1 Non ALS: 0	No	X		
009	0089_SD314		11/12/2023 01:51 PM	SOIL	ALS: 1 Non ALS: 0	No	X		
010	0089_SD315		11/12/2023 02:01 PM	SOIL	ALS: 1 Non ALS: 0	No	X		
011	0089_SD307		11/12/2023 02:08 PM	SOIL	ALS: 1 Non ALS: 0	No	X		
012	0089_SD316		11/12/2023 02:18 PM	SOIL	ALS: 1 Non ALS: 0	No	X		
013	0089_SD308		11/12/2023 02:22 PM	SOIL	ALS: 1 Non ALS: 0	No	X		
~~014~~ SNR	0089_SD409		11/12/2023 03:04 PM	SOIL	ALS: 1 Non ALS: 0	No	X		

CHAIN OF CUSTODY

ALS COC#: 61376 ALS Laboratory: EP Perth Environmental

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

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP_23

SITE: Stirling SD - JS

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES 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	0089_SD335	HDPE Soil Jar	200 mL	00621122024460	Grey	No	
002	0089_QC101	HDPE Soil Jar	200 mL	00621122011174	Grey	No	
003	0089_SD364	HDPE Soil Jar	200 mL	00621122011181	Grey	No	
004	0089_SD340	HDPE Soil Jar	200 mL	00621122011173	Grey	No	
005	0089_SD362	HDPE Soil Jar	200 mL	00621122011138	Grey	No	
006	0089_SD341	HDPE Soil Jar	200 mL	00621122024477	Grey	No	
007	0089_SD363	HDPE Soil Jar	200 mL	00621122011160	Grey	No	
008	0089_SD306	HDPE Soil Jar	200 mL	00621122024419	Grey	No	
009	0089_SD314	HDPE Soil Jar	200 mL	00621122011195	Grey	No	
010	0089_SD315	HDPE Soil Jar	200 mL	00621122011153	Grey	No	
011	0089_SD307	HDPE Soil Jar	200 mL	00621122011139	Grey	No	
012	0089_SD316	HDPE Soil Jar	200 mL	00621122024428	Grey	No	
013	0089_SD308	HDPE Soil Jar	200 mL	00621122024372	Grey	No	
014	0089_SD409	HDPE Soil Jar	200 mL	00621122011063	Grey	No	

Total Bottle Count: ALS: 14, Non ALS: 0

SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : **EP2317577**

Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: Customer Services EP
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
E-mail	: [redacted]stantec.com	E-mail	: ALSEnviro.Perth@alsglobal.com
Telephone	: ----	Telephone	: +61-8-9406 1301
Facsimile	: ----	Facsimile	: +61-8-9406 1399
Project	: WA_0089_PFASOMP_23	Page	: 1 of 2
Order number	: pfas-omp/Stirling	Quote number	: ES2022MWHAUS0002 (SY/139/19 B)
C-O-C number	: 61376	QC Level	: NEPM 2013 B3 & ALS QC Standard
Site	: Stirling SD - JS		
Sampler	: [redacted]		

Dates

Date Samples Received	: 12-Dec-2023 12:00	Issue Date	: 14-Dec-2023
Client Requested Due Date	: 19-Dec-2023	Scheduled Reporting Date	: **19-Dec-2023**

Delivery Details

Mode of Delivery	: Carrier	Security Seal	: Not Available
No. of coolers/boxes	: 2	Temperature	: 12.6 - Ice present
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 see scanned COC for sample discrepencies: extra samples , samples not received etc.
- Please direct any queries related to sample condition / numbering / breakages to Sample Receipt (Samples.Perth@alsglobal.com)
- Analytical work for this work order will be conducted at ALS Environmental Perth.
- Please direct any turnaround / technical queries to the laboratory contact designated above.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months) from receipt of samples.
- **pH analysis should be conducted within 6 hours of sampling.**
- **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.**
- 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: **SOIL**

Laboratory sample ID	Sampling date / time	Sample ID	SOIL - EA055-103 Moisture Content	SOIL - EP231X (solids) PFAS - Full Suite (28 analytes)
EP2317577-001	11-Dec-2023 09:19	0089_SD335_231211	✓	✓
EP2317577-002	11-Dec-2023 09:19	0089_QC101_231211	✓	✓
EP2317577-003	11-Dec-2023 09:54	0089_SD364_231211	✓	✓
EP2317577-004	11-Dec-2023 10:35	0089_SD340_231211	✓	✓
EP2317577-005	11-Dec-2023 11:06	0089_SD362_231211	✓	✓
EP2317577-006	11-Dec-2023 11:47	0089_SD341_231211	✓	✓
EP2317577-007	11-Dec-2023 12:06	0089_SD363_231211	✓	✓
EP2317577-008	11-Dec-2023 13:52	0089_SD306_231211	✓	✓
EP2317577-009	11-Dec-2023 13:51	0089_SD314_231211	✓	✓
EP2317577-010	11-Dec-2023 14:01	0089_SD315_231211	✓	✓
EP2317577-011	11-Dec-2023 14:08	0089_SD307_231211	✓	✓
EP2317577-012	11-Dec-2023 14:18	0089_SD316_231211	✓	✓
EP2317577-013	11-Dec-2023 14:22	0089_SD308_231211	✓	✓

Proactive Holding Time Report

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

Requested Deliverables

[redacted]
- A4 - AU Tax Invoice (INV) — Email — [redacted]cardno.com.au

DERP LAB REPORTS
- EDI Format - ESDAT (ESDAT) — Email — derp.labreports@esdat.com.au

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

CERTIFICATE OF ANALYSIS

Work Order	: **EP2317577**	Page	: 1 of 9
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: Customer Services EP
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: +61-8-9406 1301
Project	: WA_0089_PFASOMP_23	Date Samples Received	: 12-Dec-2023 12:00
Order number	: pfas-omp/Stirling	Date Analysis Commenced	: 13-Dec-2023
C-O-C number	: 61376	Issue Date	: 19-Dec-2023 12:30
Sampler	: [redacted]		
Site	: Stirling SD - JS		
Quote number	: SY/139/19 B		
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]	Laboratory Manager (Perth)	Perth Inorganics, Wangara, WA
[redacted]	Senior Organic Chemist	Perth Organics, Wangara, WA

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.

- 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: SEDIMENT (Matrix: SOIL)				Sample ID	0089_SD335_231211	0089_QC101_231211	0089_SD364_231211	0089_SD340_231211	0089_SD362_231211
				Sampling date / time	11-Dec-2023 09:19	11-Dec-2023 09:19	11-Dec-2023 09:54	11-Dec-2023 10:35	11-Dec-2023 11:06
Compound	CAS Number	LOR	Unit		EP2317577-001	EP2317577-002	EP2317577-003	EP2317577-004	EP2317577-005
					Result	Result	Result	Result	Result
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content	---	0.1	%		37.2	35.5	31.2	31.6	30.6
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg		<0.001	<0.001	<0.001	<0.001	<0.001
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002

Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)				Sample ID	0089_SD335_231211	0089_QC101_231211	0089_SD364_231211	0089_SD340_231211	0089_SD362_231211
				Sampling date / time	11-Dec-2023 09:19	11-Dec-2023 09:19	11-Dec-2023 09:54	11-Dec-2023 10:35	11-Dec-2023 11:06
Compound	CAS Number	LOR	Unit		EP2317577-001	EP2317577-002	EP2317577-003	EP2317577-004	EP2317577-005
					Result	Result	Result	Result	Result
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
EP231P: PFAS Sums									
Sum of PFAS	---	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Sum of PFAS (WA DER List)	---	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
EP231S: PFAS Surrogate									
13C4-PFOS	---	0.0002	%		108	104	96.5	112	109
13C8-PFOA	---	0.0002	%		110	110	107	113	110

Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)				Sample ID	0089_SD341_231211	0089_SD363_231211	0089_SD306_231211	0089_SD314_231211	0089_SD315_231211
				Sampling date / time	11-Dec-2023 11:47	11-Dec-2023 12:06	11-Dec-2023 13:52	11-Dec-2023 13:51	11-Dec-2023 14:01
Compound	CAS Number	LOR	Unit		EP2317577-006	EP2317577-007	EP2317577-008	EP2317577-009	EP2317577-010
					Result	Result	Result	Result	Result
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content	---	0.1	%		31.7	34.6	19.2	23.2	23.7
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg		<0.0002	0.0002	<0.0002	<0.0002	<0.0002
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg		<0.001	<0.001	<0.001	<0.001	<0.001
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002

Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)				Sample ID	0089_SD341_231211	0089_SD363_231211	0089_SD306_231211	0089_SD314_231211	0089_SD315_231211
				Sampling date / time	11-Dec-2023 11:47	11-Dec-2023 12:06	11-Dec-2023 13:52	11-Dec-2023 13:51	11-Dec-2023 14:01
Compound	CAS Number	LOR	Unit		EP2317577-006	EP2317577-007	EP2317577-008	EP2317577-009	EP2317577-010
					Result	Result	Result	Result	Result
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
EP231P: PFAS Sums									
Sum of PFAS	---	0.0002	mg/kg		<0.0002	**0.0002**	<0.0002	<0.0002	<0.0002
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg		<0.0002	**0.0002**	<0.0002	<0.0002	<0.0002
Sum of PFAS (WA DER List)	---	0.0002	mg/kg		<0.0002	**0.0002**	<0.0002	<0.0002	<0.0002
EP231S: PFAS Surrogate									
13C4-PFOS	---	0.0002	%		**105**	**106**	**107**	**114**	**100**
13C8-PFOA	---	0.0002	%		**106**	**114**	**108**	**112**	**109**

Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)			Sample ID	0089_SD307_231211	0089_SD316_231211	0089_SD308_231211	----	----
			Sampling date / time	11-Dec-2023 14:08	11-Dec-2023 14:18	11-Dec-2023 14:22	----	----
Compound	CAS Number	LOR	Unit	EP2317577-011	EP2317577-012	EP2317577-013	--------	--------
				Result	Result	Result	----	----
EA055: Moisture Content (Dried @ 105-110°C)								
Moisture Content	----	0.1	%	22.9	22.4	9.3	----	----
EP231A: Perfluoroalkyl Sulfonic Acids								
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	----	----
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	----	----
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	----	----
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	----	----
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	----	----
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	----	----
EP231B: Perfluoroalkyl Carboxylic Acids								
Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	<0.001	<0.001	----	----
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	----	----
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	----	----
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	----	----
Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	----	----
Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	----	----
Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	----	----
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	----	----
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	----	----
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	----	----
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	----	----
EP231C: Perfluoroalkyl Sulfonamides								
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	----	----

Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)				Sample ID	0089_SD307_231211	0089_SD316_231211	0089_SD308_231211	----	----
				Sampling date / time	11-Dec-2023 14:08	11-Dec-2023 14:18	11-Dec-2023 14:22	----	----
Compound	CAS Number	LOR	Unit		EP2317577-011	EP2317577-012	EP2317577-013	--------	--------
					Result	Result	Result	----	----
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	----	----
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	----	----
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	----	----
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	----	----
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	----	----
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	----	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	----	----
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	----	----
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	----	----
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	----	----
EP231P: PFAS Sums									
Sum of PFAS	---	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	----	----
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	----	----
Sum of PFAS (WA DER List)	---	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	----	----
EP231S: PFAS Surrogate									
13C4-PFOS	---	0.0002	%		116	111	100	----	----
13C8-PFOA	---	0.0002	%		110	106	106	----	----

Surrogate Control Limits

Sub-Matrix: **SEDIMENT**		Recovery Limits (%)	
Compound	*CAS Number*	*Low*	*High*
EP231S: PFAS Surrogate			
13C4-PFOS	---	76	136
13C8-PFOA	---	78	131

QUALITY CONTROL REPORT

Work Order	: **EP2317577**	Page	: 1 of 7
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: Customer Services EP
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: +61-8-9406 1301
Project	: WA_0089_PFASOMP_23	Date Samples Received	: 12-Dec-2023
Order number	: pfas-omp/Stirling	Date Analysis Commenced	: 13-Dec-2023
C-O-C number	: 61376	Issue Date	: 19-Dec-2023
Sampler	: [redacted]		
Site	: Stirling SD - JS		
Quote number	: SY/139/19 B		
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]	Laboratory Manager (Perth)	Perth Inorganics, Wangara, WA
[redacted]	Senior Organic Chemist	Perth Organics, Wangara, WA

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: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
EA055: Moisture Content (Dried @ 105-110°C) (QC Lot: 5491896)									
EP2317556-001	Anonymous	EA055: Moisture Content	----	0.1	%	19.0	20.3	6.3	0% - 20%
EP2317577-007	0089_SD363_231211	EA055: Moisture Content	----	0.1	%	34.6	34.6	0.0	0% - 20%
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 5490128)									
EP2317556-001	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
EP2317577-007	0089_SD363_231211	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	0.0002	0.0002	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 5490128)									
EP2317556-001	Anonymous	EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375 95 1	0 0002	mg/kg	0 0002	0 0002	0 0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit

Sub-Matrix: **SOIL**

				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: 5490128) - continued									
EP2317556-001	Anonymous	EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	<0.001	0.0	No Limit
EP2317577-007	0089_SD363_231211	EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	<0.001	0.0	No Limit
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 5490128)									
EP2317556 001	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754 91 6	0 0002	mg/kg	0 0002	0 0002	0 0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151 50 2	0 0005	mg/kg	0 0005	0 0005	0 0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
EP2317577-007	0089_SD363_231211	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355 31 9	0 0002	mg/kg	0 0002	0 0002	0 0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit

Sub-Matrix: **SOIL**

				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: 5490128) - continued									
EP2317577-007	0089_SD363_231211	EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 5490128)									
EP2317556-001	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
EP2317577-007	0089_SD363_231211	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
EP231P: PFAS Sums (QC Lot: 5490128)									
EP2317556-001	Anonymous	EP231X: Sum of PFAS	----	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Sum of PFAS (WA DER List)	----	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
EP2317577-007	0089_SD363_231211	EP231X: Sum of PFAS	----	0.0002	mg/kg	0.0002	0.0002	0.0	No Limit
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg	0.0002	0.0002	0.0	No Limit
		EP231X: Sum of PFAS (WA DER List)	----	0.0002	mg/kg	0.0002	0.0002	0.0	No Limit

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: **SOIL**

				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: 5490128)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	0.0011 mg/kg	113	72.0	128
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	0.00125 mg/kg	98.8	73.0	123
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	0.00118 mg/kg	102	67.0	130
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	0.00119 mg/kg	105	70.0	132
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	0.00116 mg/kg	102	68.0	136
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	0.0012 mg/kg	106	59.0	134
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5490128)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	0.00625 mg/kg	111	71.0	135
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	0.00125 mg/kg	115	69.0	132
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	0.00125 mg/kg	116	70.0	132
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	0.00125 mg/kg	108	71.0	131
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	112	69.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	111	72.0	129
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	0.00125 mg/kg	122	69.0	133
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	118	64.0	136
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	98.4	69.0	135
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	104	66.0	139
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	0.00125 mg/kg	111	69.0	133
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5490128)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	0.00125 mg/kg	104	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	0.00312 mg/kg	102	59.6	143
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	0.00312 mg/kg	91.2	62.8	140
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	0.00312 mg/kg	114	61.5	139
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	0.00312 mg/kg	114	61.9	139
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	0.00125 mg/kg	116	63.0	144
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	0.00125 mg/kg	108	61.0	139
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5490128)								

Sub-Matrix: **SOIL**

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: 5490128) - continued								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	0.00117 mg/kg	116	62.0	145
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	0.00118 mg/kg	123	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	0.0012 mg/kg	106	65.0	137
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	0.0012 mg/kg	98.8	54.8	124
EP231P: PFAS Sums (QCLot: 5490128)								
EP231X: Sum of PFAS	---	0.0002	mg/kg	<0.0002	---	---	---	---
EP231X: Sum of PFHxS and PFOS	355-46-4/17 63-23-1	0.0002	mg/kg	<0.0002	---	---	---	---
EP231X: Sum of PFAS (WA DER List)	---	0.0002	mg/kg	<0.0002	---	---	---	---

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: **SOIL**

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: 5490128)							
EP2317556-002	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0011 mg/kg	104	72.0	128
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.00117 mg/kg	105	73.0	123
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.00118 mg/kg	99.2	67.0	130
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.00119 mg/kg	105	70.0	132
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.00116 mg/kg	94.5	68.0	136
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0012 mg/kg	97.4	59.0	134
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5490128)							
EP2317556-002	Anonymous	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.00625 mg/kg	105	71.0	135
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.00125 mg/kg	105	69.0	132
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.00125 mg/kg	112	70.0	132
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.00125 mg/kg	101	71.0	131
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.00125 mg/kg	104	69.0	133
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.00125 mg/kg	106	72.0	129
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.00125 mg/kg	109	69.0	133
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.00125 mg/kg	98.8	64.0	136
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.00125 mg/kg	114	69.0	135
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.00125 mg/kg	106	66.0	139
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.00125 mg/kg	107	69.0	133
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5490128)							

Sub-Matrix: **SOIL**

				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: 5490128) - continued							
EP2317556-002	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.00125 mg/kg	105	48.0	128
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.00312 mg/kg	99.5	60.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.00312 mg/kg	84.0	60.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.00312 mg/kg	101	60.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.00312 mg/kg	107	60.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.00125 mg/kg	118	63.0	144
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.00125 mg/kg	110	61.0	139
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5490128)							
EP2317556-002	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.00117 mg/kg	112	62.0	145
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.00118 mg/kg	109	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0012 mg/kg	102	65.0	137
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0012 mg/kg	101	60.0	130

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **EP2317577**	Page	: 1 of 5
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Telephone	: +61-8-9406 1301
Project	: WA_0089_PFASOMP_23	Date Samples Received	: 12-Dec-2023
Site	: Stirling SD - JS	Issue Date	: 19-Dec-2023
Sampler	: [redacted] [redacted]	No. of samples received	: 13
Order number	: pfas-omp/Stirling	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

- **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: **SOIL**

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
EA055: Moisture Content (Dried @ 105-110°C)								
HDPE Soil Jar (EA055)								
0089_SD335_231211,	0089_QC101_231211,	**11-Dec-2023**	**----**	----	----	**14-Dec-2023**	25-Dec-2023	✓
0089_SD364_231211,	0089_SD340_231211,							
0089_SD362_231211,	0089_SD341_231211,							
0089_SD363_231211,	0089_SD306_231211,							
0089_SD314_231211,	0089_SD315_231211,							
0089_SD307_231211,	0089_SD316_231211,							
0089_SD308_231211								
EP231A: Perfluoroalkyl Sulfonic Acids								
HDPE Soil Jar (EP231X)								
0089 SD335 231211,	0089 QC101 231211,	**11-Dec-2023**	**13-Dec-2023**	08-Jun-2024	✓	**14-Dec-2023**	22-Jan-2024	✓
0089 SD364 231211,	0089 SD340 231211,							
0089 SD362 231211,	0089 SD341 231211,							
0089 SD363 231211,	0089 SD306 231211,							
0089 SD314 231211,	0089 SD315 231211,							
0089 SD307 231211,	0089 SD316 231211,							
0089 SD308 231211								
EP231B: Perfluoroalkyl Carboxylic Acids								
HDPE Soil Jar (EP231X)								
0089_SD335_231211,	0089_QC101_231211,	**11-Dec-2023**	**13-Dec-2023**	08-Jun-2024	✓	**14-Dec-2023**	22-Jan-2024	✓
0089_SD364_231211,	0089_SD340_231211,							
0089_SD362_231211,	0089_SD341_231211,							
0089_SD363_231211,	0089_SD306_231211,							
0089_SD314_231211,	0089_SD315_231211,							
0089_SD307_231211,	0089_SD316_231211,							
0089_SD308_231211								

Matrix: **SOIL**

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 Soil Jar (EP231X)							
0089_SD335_231211, 0089_SD364_231211, 0089_SD362_231211, 0089_SD363_231211, 0089_SD314_231211, 0089_SD307_231211, 0089_SD308_231211, 0089_QC101_231211, 0089_SD340_231211, 0089_SD341_231211, 0089_SD306_231211, 0089_SD315_231211, 0089_SD316_231211,	**11-Dec-2023**	**13-Dec-2023**	08-Jun-2024	✓	**14-Dec-2023**	22-Jan-2024	✓
EP231D: (n:2) Fluorotelomer Sulfonic Acids							
HDPE Soil Jar (EP231X)							
0089_SD335_231211, 0089_SD364_231211, 0089_SD362_231211, 0089_SD363_231211, 0089_SD314_231211, 0089_SD307_231211, 0089_SD308_231211, 0089_QC101_231211, 0089_SD340_231211, 0089_SD341_231211, 0089_SD306_231211, 0089_SD315_231211, 0089_SD316_231211,	**11-Dec-2023**	**13-Dec-2023**	08-Jun-2024	✓	**14-Dec-2023**	22-Jan-2024	✓
EP231P: PFAS Sums							
HDPE Soil Jar (EP231X)							
0089_SD335_231211, 0089_SD364_231211, 0089_SD362_231211, 0089_SD363_231211, 0089_SD314_231211, 0089_SD307_231211, 0089_SD308_231211, 0089_QC101_231211, 0089_SD340_231211, 0089_SD341_231211, 0089_SD306_231211, 0089_SD315_231211, 0089_SD316_231211,	**11-Dec-2023**	**13-Dec-2023**	08-Jun-2024	✓	**14-Dec-2023**	22-Jan-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: **SOIL**

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)							
Moisture Content	EA055	2	17	**11.76**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	20	**5.00**	**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
Moisture Content	EA055	SOIL	In house: A gravimetric procedure based on weight loss over a 12 hour drying period at 105-110 degrees C. This method is compliant with NEPM Schedule B(3).
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	SOIL	In-house: Analysis of soils by solvent extraction followed by LC-Electrospray-MS-MS, Negative Mode using MRM using internal standard quantitation. Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to a portion of soil which is then extracted with MTBE and an ion pairing reagent. A portion of extract is exchanged into the analytical solvent mixture, combined with an equal volume reagent water and 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
QuECheRS Extraction of Solids	* ORG71	SOIL	In house: Sequential extractions with Acetonitrile/Methanol by shaking. Extraction efficiency aided by the addition of salts under acidic conditions. Where relevant, interferences from co-extracted organics are removed with dispersive clean-up media (dSPE). The extract is either diluted or concentrated and exchanged into the analytical solvent.

ALSCompass SAMPLING Intelligence

ALS

Environmental Division
Perth
Work Order Reference
EP2317627

Telephone +61-8-9406 1301

Custody Document for Submissions via ALS Compass App

Project: WA_0089_PFASDMP_23 Client: Stantec Project Manager: [redacted]

ALS Compass COC Reference: 61436, 61386, 61459, 61461 # Samples: 4 Eskies Sampler: Phone: [redacted]

Turnaround Requirements: Standard Urgent

Special Instructions:	ALS Use Only			
	Custody seal intact?	YES	NO	N/A
	Free ice / frozen ice bricks upon receipt?	YES	NO	N/A
	Random sample temperature on receipt?		°C	

Custody:

Relinquished by:	Received by:	Relinquished by:	Received by:
[redacted]	[redacted]		
Date / Time: 12/12/23 ~ 8:00pm	Date / Time: 13/12 1215	Date / Time:	Date / Time:

CHAIN OF CUSTODY

ALS COC#: 61386 *ALS Laboratory:* EP Perth Environmental

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

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP_23

SITE: Stirling GW - AH

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES 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	WA OMP Water Suite WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
001	0089_MW268		12/12/2023 11:27 AM	WATER	ALS: 3 Non ALS: 0	No	X		
002	0089_MW269		12/12/2023 11:28 AM	WATER	ALS: 3 Non ALS: 0	No	X		
003	0089_MW496		12/12/2023 12:05 PM	WATER	ALS: 3 Non ALS: 0	No	X		
004	0089_MW516		12/12/2023 12:06 PM	WATER	ALS: 3 Non ALS: 0	No	X		
005	0089_MW249		12/12/2023 12:30 PM	WATER	ALS: 3 Non ALS: 0	No	X		
006	0089_MW243		12/12/2023 01:35 PM	WATER	ALS: 3 Non ALS: 0	No	X		
007	0089_MW240		12/12/2023 01:35 PM	WATER	ALS: 3 Non ALS: 0	No	X		

CHAIN OF CUSTODY

ALS COC#: 61386 *ALS Laboratory:* EP Perth Environmental

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

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP_23

SITE: Stirling GW - AH

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES 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	WA OMP Water Suite WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
008	0089_MW238		12/12/2023 01:36 PM	WATER	ALS: 3 Non ALS: 0	No	X		
009	0089_MW239		12/12/2023 01:37 PM	WATER	ALS: 3 Non ALS: 0	No	X		
010	0089_MW245		12/12/2023 01:38 PM	WATER	ALS: 3 Non ALS: 0	No	X		

CHAIN OF CUSTODY

COC#: 61386 ALS Laboratory: EP Perth Environmental

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

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP_23

SITE: Stirling GW - AH

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted] CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

PRIMARY SAMPLER: [redacted] QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES 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	0089_MW268	Clear Plastic Bottle - Natural	125 mL	00070522229955	Green	No	
001	0089_MW268	HDPE (no PTFE)	20 mL	00352309068248	Grey	No	
001	0089_MW268	HDPE (no PTFE)	20 mL	00352309068253	Grey	No	
002	0089_MW269	Clear Plastic Bottle - Natural	125 mL	00070522229657	Green	No	
002	0089_MW269	HDPE (no PTFE)	20 mL	00352309068226	Grey	No	
002	0089_MW269	HDPE (no PTFE)	20 mL	00352309067956	Grey	No	
003	0089_MW496	HDPE (no PTFE)	20 mL	00352309068052	Grey	No	
003	0089_MW496	HDPE (no PTFE)	20 mL	00352309067917	Grey	No	
003	0089_MW496	Clear Plastic Bottle - Natural	125 mL	00070522229957	Green	No	
004	0089_MW516	Clear Plastic Bottle - Natural	125 mL	00070522229842	Green	No	
004	0089_MW516	HDPE (no PTFE)	20 mL	00352309068179	Grey	No	
004	0089_MW516	HDPE (no PTFE)	20 mL	00352309067994	Grey	No	
005	0089_MW249	HDPE (no PTFE)	20 mL	00352309068053	Grey	No	
005	0089_MW249	HDPE (no PTFE)	20 mL	00352309067975	Grey	No	
005	0089_MW249	Clear Plastic Bottle - Natural	125 mL	00070522229780	Green	No	
006	0089_MW243	HDPE (no PTFE)	20 mL	00352309068137	Grey	No	
006	0089_MW243	HDPE (no PTFE)	20 mL	00352309068015	Grey	No	
006	0089_MW243	Clear Plastic Bottle - Natural	125 mL	00070522229651	Green	No	
007	0089_MW240	Clear Plastic Bottle - Natural	125 mL	00070522229878	Green	No	
007	0089_MW240	HDPE (no PTFE)	20 mL	00352309067996	Grey	No	
007	0089_MW240	HDPE (no PTFE)	20 mL	00352309068028	Grey	No	
008	0089_MW238	HDPE (no PTFE)	20 mL	00352309068054	Grey	No	
008	0089_MW238	Clear Plastic Bottle - Natural	125 mL	00070522229884	Green	No	
008	0089_MW238	HDPE (no PTFE)	20 mL	00352309067978	Grey	No	
009	0089_MW239	Clear Plastic Bottle - Natural	125 mL	00070522229664	Green	No	
009	0089_MW239	HDPE (no PTFE)	20 mL	00352309068254	Grey	No	

CHAIN OF CUSTODY

COC#: 61386 *ALS Laboratory:* EP Perth Environmental

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

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP_23

SITE: Stirling GW - AH

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES 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:			

009	0089_MW239	HDPE (no PTFE)	20 mL	00352309068227	Grey	No	
010	0089_MW245	Clear Plastic Bottle - Natural	125 mL	00070522229797	Green	No	
010	0089_MW245	HDPE (no PTFE)	20 mL	00352309068016	Grey	No	
010	0089_MW245	HDPE (no PTFE)	20 mL	00352309068003	Grey	No	

Total Bottle Count: ALS: 30, Non ALS: 0

SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : **EP2317627**

Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: Customer Services EP
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
E-mail	: [redacted]stantec.com	E-mail	: ALSEnviro.Perth@alsglobal.com
Telephone	: ----	Telephone	: +61-8-9406 1301
Facsimile	: ----	Facsimile	: +61-8-9406 1399
Project	: WA_0089_PFASOMP_23	Page	: 1 of 2
Order number	: pfas-omp/Stirling	Quote number	: ES2022MWHAUS0002 (SY/139/19 B)
C-O-C number	: 61386	QC Level	: NEPM 2013 B3 & ALS QC Standard
Site	: Stirling GW - AH		
Sampler	: [redacted] [redacted]		

Dates

Date Samples Received	: 13-Dec-2023 12:15	Issue Date	: 15-Dec-2023
Client Requested Due Date	: 27-Dec-2023	Scheduled Reporting Date	: **27-Dec-2023**

Delivery Details

Mode of Delivery	: Carrier	Security Seal	: Not Available
No. of coolers/boxes	: 1	Temperature	: 11.7 - Ice present
Receipt Detail	:	No. of samples received / analysed	: 10 / 10

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 see scanned COC for sample discrepencies: extra samples , samples not received etc.
- Please direct any queries related to sample condition / numbering / breakages to Sample Receipt (Samples.Perth@alsglobal.com)
- Analytical work for this work order will be conducted at ALS Environmental Perth.
- Please direct any turnaround / technical queries to the laboratory contact designated above.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months) from receipt of samples.
- **pH analysis should be conducted within 6 hours of sampling.**
- **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.**
- 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)	WATER - NT-01 & 02 Ca, Mg, Na, K, Cl, SO4, Alkalinity
EP2317627-001	12-Dec-2023 11:27	0089_MW268_231212	✓	✓
EP2317627-002	12-Dec-2023 11:28	0089_MW269_231212	✓	✓
EP2317627-003	12-Dec-2023 12:05	0089_MW496_231212	✓	✓
EP2317627-004	12-Dec-2023 12:06	0089_MW516_231212	✓	✓
EP2317627-005	12-Dec-2023 12:30	0089_MW249_231212	✓	✓
EP2317627-006	12-Dec-2023 13:35	0089_MW243_231212	✓	✓
EP2317627-007	12-Dec-2023 13:35	0089_MW240_231212	✓	✓
EP2317627-008	12-Dec-2023 13:36	0089_MW238_231212	✓	✓
EP2317627-009	12-Dec-2023 13:37	0089_MW239_231212	✓	
EP2317627-010	12-Dec-2023 13:38	0089_MW245_231212	✓	✓

Proactive Holding Time Report

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

Requested Deliverables

[redacted]
- A4 - AU Tax Invoice (INV) — Email — [redacted]cardno.com.au

DERP LAB REPORTS
- EDI Format - ESDAT (ESDAT) — Email — derp.labreports@esdat.com.au

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

CERTIFICATE OF ANALYSIS

Work Order	: **EP2317627**	Page	: 1 of 9
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: Customer Services EP
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: +61-8-9406 1301
Project	: WA_0089_PFASOMP_23	Date Samples Received	: 13-Dec-2023 12:15
Order number	: pfas-omp/Stirling	Date Analysis Commenced	: 15-Dec-2023
C-O-C number	: 61386	Issue Date	: 28-Dec-2023 16:37
Sampler	: [redacted]		
Site	: Stirling GW - AH		
Quote number	: SY/139/19 B		
No. of samples received	: 10		
No. of samples analysed	: 10		

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]	Inorganics Supervisor	Perth Inorganics, Wangara, WA
[redacted]	Senior Organic Chemist	Perth Organics, Wangara, WA

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.
- As per QWI – EN55-3 Data Interpreting Procedures, Ionic balances are typically calculated using Major Anions - Chloride, Alkalinity and Sulfate; and Major Cations - Calcium, Magnesium, Potassium and Sodium. Where applicable and dependent upon sample matrix, the Ionic Balance may also include the additional contribution of Ammonia, Dissolved Metals by ICPMS and H+ to the Cations and Nitrate, SiO2 and Fluoride to the Anions.
- Sodium Adsorption Ratio (where reported): Where results for Na, Ca or Mg are <LOR, a concentration at half the reported LOR is incorporated into the SAR calculation. This represents a conservative approach for Na relative to the assumption that <LOR = zero concentration and a conservative approach for Ca & Mg relative to the assumption that <LOR is equivalent to the LOR concentration.
- 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.
- ED045G: The presence of Thiocyanate, Thiosulfate and Sulfite can positively contribute to the chloride result, thereby may bias results higher than expected. Results should be scrutinised accordingly.

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW268_231212	0089_MW269_231212	0089_MW496_231212	0089_MW516_231212	0089_MW249_231212
				Sampling date / time	12-Dec-2023 11:27	12-Dec-2023 11:28	12-Dec-2023 12:05	12-Dec-2023 12:06	12-Dec-2023 12:30
Compound	CAS Number	LOR	Unit		EP2317627-001	EP2317627-002	EP2317627-003	EP2317627-004	EP2317627-005
					Result	Result	Result	Result	Result
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	<1	<1	<1	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	<1	<1	<1	<1
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		436	464	389	462	457
Total Alkalinity as CaCO3	---	1	mg/L		436	464	389	462	457
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		659	44	78	28	50
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		2920	239	162	44	147
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		201	80	78	117	101
Magnesium	7439-95-4	1	mg/L		255	59	40	38	42
Sodium	7440-23-5	1	mg/L		1650	158	143	57	104
Potassium	7440-09-7	1	mg/L		87	14	13	8	7
EN055: Ionic Balance									
ø Total Anions	---	0.01	meq/L		105	16.9	14.0	11.0	14.3
ø Total Cations	---	0.01	meq/L		105	16.1	13.7	11.6	13.2
ø Ionic Balance	---	0.01	%		0.10	2.58	0.83	2.62	4.07
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		0.04	0.06	0.04	0.02	<0.02
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		0.07	0.09	0.07	0.03	<0.02
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		0.33	0.31	0.79	0.32	0.21
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		<0.02	<0.02	0.07	0.03	<0.02
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		<0.01	0.38	7.04	4.21	0.08
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW268_231212	0089_MW269_231212	0089_MW496_231212	0089_MW516_231212	0089_MW249_231212
				Sampling date / time	12-Dec-2023 11:27	12-Dec-2023 11:28	12-Dec-2023 12:05	12-Dec-2023 12:06	12-Dec-2023 12:30
Compound	CAS Number	LOR	Unit		EP2317627-001	EP2317627-002	EP2317627-003	EP2317627-004	EP2317627-005
					Result	Result	Result	Result	Result
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		**0.03**	**0.14**	**0.11**	**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**	**0.07**	**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
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									

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW268_231212	0089_MW269_231212	0089_MW496_231212	0089_MW516_231212	0089_MW249_231212
				Sampling date / time	12-Dec-2023 11:27	12-Dec-2023 11:28	12-Dec-2023 12:05	12-Dec-2023 12:06	12-Dec-2023 12:30
Compound	CAS Number	LOR	Unit		EP2317627-001	EP2317627-002	EP2317627-003	EP2317627-004	EP2317627-005
					Result	Result	Result	Result	Result
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
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		**0.47**	**1.01**	**8.19**	**4.65**	**0.29**
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		**0.33**	**0.69**	**7.83**	**4.53**	**0.29**
Sum of PFAS (WA DER List)	---	0.01	µg/L		**0.40**	**0.92**	**8.05**	**4.59**	**0.29**
EP231S: PFAS Surrogate									
13C4-PFOS	---	0.02	%		**95.6**	**85.4**	**103**	**97.6**	**88.9**
13C8-PFOA	---	0.02	%		**99.5**	**101**	**96.5**	**96.7**	**101**

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW243_231212	0089_MW240_231212	0089_MW238_231212	0089_MW239_231212	0089_MW245_231212
				Sampling date / time	12-Dec-2023 13:35	12-Dec-2023 13:35	12-Dec-2023 13:36	12-Dec-2023 13:37	12-Dec-2023 13:38
Compound	CAS Number	LOR	Unit		EP2317627-006	EP2317627-007	EP2317627-008	EP2317627-009	EP2317627-010
					Result	Result	Result	Result	Result
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	<1	<1	----	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	<1	<1	----	<1
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		305	247	243	----	349
Total Alkalinity as CaCO3	----	1	mg/L		305	247	243	----	349
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		65	39	38	----	4
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		58	44	31	----	25
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		130	114	92	----	118
Magnesium	7439-95-4	1	mg/L		18	12	15	----	14
Sodium	7440-23-5	1	mg/L		50	34	32	----	20
Potassium	7440-09-7	1	mg/L		6	4	5	----	3
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		9.08	6.99	6.52	----	7.76
ø Total Cations	----	0.01	meq/L		10.3	8.26	7.34	----	7.99
ø Ionic Balance	----	0.01	%		6.26	8.32	5.94	----	1.43
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	0.04	<0.02	<0.02	<0.02
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		0.08	3.84	0.02	<0.01	<0.01
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		<0.02	0.04	<0.02	<0.02	<0.02
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		0.01	<0.01	<0.01	0.02	0.02
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW243_231212	0089_MW240_231212	0089_MW238_231212	0089_MW239_231212	0089_MW245_231212
				Sampling date / time	12-Dec-2023 13:35	12-Dec-2023 13:35	12-Dec-2023 13:36	12-Dec-2023 13:37	12-Dec-2023 13:38
Compound	CAS Number	LOR	Unit		EP2317627-006	EP2317627-007	EP2317627-008	EP2317627-009	EP2317627-010
					Result	Result	Result	Result	Result
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	**0.10**	<0.02	<0.02	<0.02
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		<0.02	**0.03**	<0.02	<0.02	<0.02
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		<0.01	**0.11**	<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
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									

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW243_231212	0089_MW240_231212	0089_MW238_231212	0089_MW239_231212	0089_MW245_231212
				Sampling date / time	12-Dec-2023 13:35	12-Dec-2023 13:35	12-Dec-2023 13:36	12-Dec-2023 13:37	12-Dec-2023 13:38
Compound	CAS Number	LOR	Unit		EP2317627-006	EP2317627-007	EP2317627-008	EP2317627-009	EP2317627-010
					Result	Result	Result	Result	Result
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
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		**0.09**	**4.16**	**0.02**	**0.02**	**0.02**
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		**0.09**	**3.84**	**0.02**	**0.02**	**0.02**
Sum of PFAS (WA DER List)	---	0.01	µg/L		**0.09**	**4.08**	**0.02**	**0.02**	**0.02**
EP231S: PFAS Surrogate									
13C4-PFOS	---	0.02	%		**89.6**	**90.1**	**90.4**	**91.5**	**88.1**
13C8-PFOA	---	0.02	%		**94.4**	**96.1**	**104**	**106**	**98.2**

Surrogate Control Limits

Sub-Matrix: GROUNDWATER		Recovery Limits (%)	
Compound	CAS Number	Low	High
EP231S: PFAS Surrogate			
13C4-PFOS	---	65	140
13C8-PFOA	---	71	133

QUALITY CONTROL REPORT

Work Order	: **EP2317627**	Page	: 1 of 10
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: Customer Services EP
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: +61-8-9406 1301
Project	: WA_0089_PFASOMP_23	Date Samples Received	: 13-Dec-2023
Order number	: pfas-omp/Stirling	Date Analysis Commenced	: 15-Dec-2023
C-O-C number	: 61386	Issue Date	: 28-Dec-2023
Sampler	: [redacted]		
Site	: Stirling GW - AH		
Quote number	: SY/139/19 B		
No. of samples received	: 10		
No. of samples analysed	: 10		

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]	Inorganics Supervisor	Perth Inorganics, Wangara, WA
[redacted]	Senior Organic Chemist	Perth Organics, Wangara, WA

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 (%)
ED037P: Alkalinity by PC Titrator (QC Lot: 5502420)									
EP2317627-002	0089_MW269_231212	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	464	463	0.3	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	464	463	0.3	0% - 20%
EP2317629-002	Anonymous	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	130	131	0.0	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	130	131	0.0	0% - 20%
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QC Lot: 5507756)									
EP2317805-004	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	118	118	0.0	0% - 20%
EP2317627-001	0089_MW268_231212	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	659	659	0.0	0% - 20%
ED093F: Dissolved Major Cations (QC Lot: 5500558)									
EP2317627-001	0089_MW268_231212	ED093F: Calcium	7440-70-2	1	mg/L	201	201	0.0	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	255	255	0.0	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	1650	1630	1.0	0% - 20%
		ED093F: Potassium	7440 09 7	1	mg/L	87	86	1 2	0% 20%
EP2317628-002	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	87	89	2.4	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	15	15	0.0	0% - 50%
		ED093F: Sodium	7440-23-5	1	mg/L	27	27	0.0	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	5	5	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 (%)
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 5502773)									
EP2317628-001	Anonymous	EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	0.07	0.07	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	0.03	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: 5502975)									
EP2317628-007	Anonymous	EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01 (0.04)*	µg/L	22.4	19.0	16.3	0% - 20%
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01 (0.04)*	µg/L	56.8	48.0	16.8	0% - 20%
		EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	1.68	1.60	5.4	0% - 20%
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02 (0.04)*	µg/L	1.40	1.15	19.0	0% - 20%
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	3.69	3.46	6.3	0% - 20%
		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: 5502773)									
EP2317628-001	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
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 5502975)									
EP2317628-007	Anonymous	EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	1.40	1.28	8.3	0% - 20%
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	0.99	0.88	12.1	0% - 20%
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	4.46	3.73	17.7	0% - 20%
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	0.44	0.41	6.1	0% - 20%
		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	0.8	0.7	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: 5502773)									
EP2317628-001	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
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 5502975)									
EP2317628-007	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: 5502773)									
EP2317628-001	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
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 5502975)									
EP2317628-007	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

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: 5502975) - continued									
EP2317628-007	Anonymous	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: 5502773)									
EP2317628-001	Anonymous	EP231X: Sum of PFAS	----	0.01	µg/L	0.10	0.09	10.5	0% - 50%
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	0.07	0.07	0.0	No Limit
		EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	0.07	0.07	0.0	No Limit
EP231P: PFAS Sums (QC Lot: 5502975)									
EP2317628-007	Anonymous	EP231X: Sum of PFAS	----	0.01 (0.04)*	µg/L	94.1	80.2	15.9	0% - 20%
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01 (0.04)*	µg/L	79.2	67.0	16.7	0% - 20%
		EP231X: Sum of PFAS (WA DER List)	----	0.01 (0.04)*	µg/L	89.0	75.6	16.2	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
ED037P: Alkalinity by PC Titrator (QCLot: 5502420)								
ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	---	---	---	---
ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	---	---	---	---
ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	<1	---	---	---	---
ED037-P: Total Alkalinity as CaCO3	---	1	mg/L	<1	20 mg/L	96.8	85.1	126
				<1	200 mg/L	97.1	90.5	111
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 5507756)								
ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<1	25 mg/L	98.0	89.9	112
				<1	500 mg/L	95.9	89.9	112
ED045G: Chloride by Discrete Analyser (QCLot: 5507757)								
ED045G: Chloride	16887-00-6	1	mg/L	<1	10 mg/L	95.8	88.6	113
				<1	1000 mg/L	96.0	88.6	113
ED093F: Dissolved Major Cations (QCLot: 5500558)								
ED093F: Calcium	7440-70-2	1	mg/L	<1	50 mg/L	101	86.5	117
ED093F: Magnesium	7439-95-4	1	mg/L	<1	50 mg/L	100	88.4	110
ED093F: Sodium	7440-23-5	1	mg/L	<1	50 mg/L	98.4	91.4	113
ED093F: Potassium	7440-09-7	1	mg/L	<1	50 mg/L	96.3	84.6	108
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5502773)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.2218 µg/L	92.9	72.0	130
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.2352 µg/L	108	71.0	127
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	0.2373 µg/L	92.7	68.0	131
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.238 µg/L	102	69.0	134
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.232 µg/L	97.2	65.0	140
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.241 µg/L	92.7	53.0	142
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5502975)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.2218 µg/L	96.2	72.0	130
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.2352 µg/L	101	71.0	127
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	0.2373 µg/L	94.2	68.0	131
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.238 µg/L	92.8	69.0	134
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.232 µg/L	90.1	65.0	140
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.241 µg/L	86.5	53.0	142

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: 5502773)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	1.25 µg/L	95.1	73.0	129
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	0.25 µg/L	93.2	72.0	129
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	0.25 µg/L	103	72.0	129
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	0.25 µg/L	101	72.0	130
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	0.25 µg/L	105	71.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	0.25 µg/L	94.6	69.0	130
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	0.25 µg/L	93.4	71.0	129
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	0.25 µg/L	88.2	69.0	133
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	0.25 µg/L	99.4	72.0	134
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	0.25 µg/L	102	65.0	144
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	0.25 µg/L	100	71.0	132
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5502975)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	1.25 µg/L	94.4	73.0	129
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	0.25 µg/L	98.6	72.0	129
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	0.25 µg/L	88.4	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
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	87.8	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	118	69.0	133
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	0.25 µg/L	88.8	72.0	134
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	0.25 µg/L	90.0	65.0	144
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	0.25 µg/L	104	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5502773)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.25 µg/L	82.0	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	92.4	60.5	138
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	0.625 µg/L	91.4	68.3	134
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	0.625 µg/L	104	62.2	138
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	0.25 µg/L	98.4	65.0	136
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	0.25 µg/L	104	61.0	135

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: 5502975)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.25 µg/L	95.6	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	0.625 µg/L	104	68.0	141
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	0.625 µg/L	78.3	60.5	138
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	0.625 µg/L	113	68.3	134
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	0.625 µg/L	92.8	62.2	138
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	0.25 µg/L	88.4	65.0	136
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	0.25 µg/L	108	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5502773)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.2343 µg/L	110	63.0	143
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	0.2378 µg/L	117	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	0.24 µg/L	115	67.0	138
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	0.241 µg/L	98.1	64.2	133
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5502975)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.2343 µg/L	96.2	63.0	143
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	0.2378 µg/L	91.2	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	0.24 µg/L	86.4	67.0	138
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	0.241 µg/L	83.4	64.2	133
EP231P: PFAS Sums (QCLot: 5502773)								
EP231X: Sum of PFAS	---	0.01	µg/L	<0.01	---	---	---	---
EP231X: Sum of PFHxS and PFOS	355-46-4/17 63-23-1	0.01	µg/L	<0.01	---	---	---	---
EP231X: Sum of PFAS (WA DER List)	---	0.01	µg/L	<0.01	---	---	---	---
EP231P: PFAS Sums (QCLot: 5502975)								
EP231X: Sum of PFAS	---	0.01	µg/L	<0.01	---	---	---	---
EP231X: Sum of PFHxS and PFOS	355-46-4/17 63-23-1	0.01	µg/L	<0.01	---	---	---	---
EP231X: Sum of PFAS (WA DER List)	---	0.01	µg/L	<0.01	---	---	---	---

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**

Matrix Spike (MS) Report

Sub-Matrix: **WATER**

Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report: Spike Concentration	Matrix Spike (MS) Report: SpikeRecovery(%) MS	Matrix Spike (MS) Report: Acceptable Limits (%) Low	Matrix Spike (MS) Report: Acceptable Limits (%) High
ED045G: Chloride by Discrete Analyser (QCLot: 5507757)							
EP2317627-001	0089_MW268_231212	ED045G: Chloride	16887-00-6	200 mg/L	# Not Determined	70.0	130
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5502975)							
EP2317628-011	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.2218 µg/L	93.5	72.0	129
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.232 µg/L	114	71.0	127
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.2352 µg/L	86.5	68.0	129
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.238 µg/L	91.6	69.0	134
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.232 µg/L	95.1	65.0	140
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.241 µg/L	80.1	53.0	129
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5502975)							
EP2317628-011	Anonymous	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	1.25 µg/L	97.5	73.0	142
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.25 µg/L	93.8	72.0	129
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.25 µg/L	97.2	72.0	129
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.25 µg/L	86.6	72.0	130
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.25 µg/L	98.4	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	103	71.0	134
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.25 µg/L	118	69.0	133
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.25 µg/L	91.0	72.0	134
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.25 µg/L	90.6	65.0	144
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.25 µg/L	106	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5502975)							
EP2317628-011	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.25 µg/L	99.4	59.0	135
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.625 µg/L	88.0	70.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.625 µg/L	74.0	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.625 µg/L	98.1	70.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.625 µg/L	79.7	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.25 µg/L	86.8	65.0	136
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.25 µg/L	98.8	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5502975)							
EP2317628-011	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.234 µg/L	98.1	63.0	143
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.2378 µg/L	84.8	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.24 µg/L	83.1	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: 5502975) - continued							
EP2317628-011	Anonymous	EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.2415 µg/L	88.2	70.0	130

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **EP2317627**	Page	: 1 of 6
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Telephone	: +61-8-9406 1301
Project	: WA_0089_PFASOMP_23	Date Samples Received	: 13-Dec-2023
Site	: Stirling GW - AH	Issue Date	: 28-Dec-2023
Sampler	: [redacted]	No. of samples received	: 10
Order number	: pfas-omp/Stirling	No. of samples analysed	: 10

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.**
- **Matrix Spike outliers exist - please see following pages for full details.**
- **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 : Quality Control Samples

Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

Matrix: **WATER**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
Matrix Spike (MS) Recoveries							
ED045G: Chloride by Discrete Analyser	EP2317627--001	0089_MW268_231212	**Chloride**	16887-00-6	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**

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)						
Chloride by Discrete Analyser	ED045G	0	9	0.00	10.00	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	37	5.41	10.00	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)						
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	37	2.70	5.00	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	0	20	0.00	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*			*Analysis*		
			Date extracted	*Due for extraction*	*Evaluation*	*Date analysed*	*Due for analysis*	*Evaluation*
ED037P: Alkalinity by PC Titrator								
Clear Plastic Bottle - Natural (ED037-P)								
0089_MW268_231212,	0089_MW269_231212,	**12-Dec-2023**	**----**	----	----	**19-Dec-2023**	26-Dec-2023	✓
0089_MW496_231212,	0089_MW516_231212,							
0089_MW249_231212,	0089_MW243_231212,							
0089_MW240_231212,	0089_MW238_231212,							
0089_MW245_231212								

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
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA							
Clear Plastic Bottle - Natural (ED041G)							
0089_MW268_231212, 0089_MW269_231212, 0089_MW496_231212, 0089_MW516_231212, 0089_MW249_231212, 0089_MW243_231212, 0089_MW240_231212, 0089_MW238_231212, 0089_MW245_231212	**12-Dec-2023**	---	---	---	**27-Dec-2023**	09-Jan-2024	✓
ED045G: Chloride by Discrete Analyser							
Clear Plastic Bottle - Natural (ED045G)							
0089_MW268_231212, 0089_MW269_231212, 0089_MW496_231212, 0089_MW516_231212, 0089_MW249_231212, 0089_MW243_231212, 0089_MW240_231212, 0089_MW238_231212, 0089_MW245_231212	**12-Dec-2023**	---	---	---	**27-Dec-2023**	09-Jan-2024	✓
ED093F: Dissolved Major Cations							
Clear Plastic Bottle - Natural (ED093F)							
0089_MW268_231212, 0089_MW269_231212, 0089_MW496_231212, 0089_MW516_231212, 0089_MW249_231212, 0089_MW243_231212, 0089_MW240_231212, 0089_MW238_231212, 0089_MW245_231212	**12-Dec-2023**	---	---	---	**19-Dec-2023**	19-Dec-2023	✓
EP231A: Perfluoroalkyl Sulfonic Acids							
HDPE (no PTFE) (EP231X)							
0089_MW268_231212, 0089_MW269_231212, 0089_MW249_231212, 0089_MW243_231212, 0089_MW240_231212, 0089_MW238_231212, 0089_MW245_231212	**12-Dec-2023**	**19-Dec-2023**	09-Jun-2024	✓	**19-Dec-2023**	09-Jun-2024	✓
HDPE (no PTFE) (EP231X)							
0089_MW496_231212, 0089_MW516_231212, 0089_MW239_231212	**12-Dec-2023**	**19-Dec-2023**	09-Jun-2024	✓	**20-Dec-2023**	09-Jun-2024	✓
EP231B: Perfluoroalkyl Carboxylic Acids							
HDPE (no PTFE) (EP231X)							
0089_MW268_231212, 0089_MW269_231212, 0089_MW249_231212, 0089_MW243_231212, 0089_MW240_231212, 0089_MW238_231212, 0089_MW245_231212	**12-Dec-2023**	**19-Dec-2023**	09-Jun-2024	✓	**19-Dec-2023**	09-Jun-2024	✓
HDPE (no PTFE) (EP231X)							
0089_MW496_231212, 0089_MW516_231212, 0089_MW239_231212	**12-Dec-2023**	**19-Dec-2023**	09-Jun-2024	✓	**20-Dec-2023**	09-Jun-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) 0089_MW268_231212, 0089_MW269_231212, 0089_MW249_231212, 0089_MW243_231212, 0089_MW240_231212, 0089_MW238_231212, 0089_MW245_231212	**12-Dec-2023**	**19-Dec-2023**	09-Jun-2024	✓	**19-Dec-2023**	09-Jun-2024	✓
HDPE (no PTFE) (EP231X) 0089_MW496_231212, 0089_MW516_231212, 0089_MW239_231212	**12-Dec-2023**	**19-Dec-2023**	09-Jun-2024	✓	**20-Dec-2023**	09-Jun-2024	✓
EP231D: (n:2) Fluorotelomer Sulfonic Acids							
HDPE (no PTFE) (EP231X) 0089_MW268_231212, 0089_MW269_231212, 0089_MW249_231212, 0089_MW243_231212, 0089_MW240_231212, 0089_MW238_231212, 0089_MW245_231212	**12-Dec-2023**	**19-Dec-2023**	09-Jun-2024	✓	**19-Dec-2023**	09-Jun-2024	✓
HDPE (no PTFE) (EP231X) 0089_MW496_231212, 0089_MW516_231212, 0089_MW239_231212	**12-Dec-2023**	**19-Dec-2023**	09-Jun-2024	✓	**20-Dec-2023**	09-Jun-2024	✓
EP231P: PFAS Sums							
HDPE (no PTFE) (EP231X) 0089_MW268_231212, 0089_MW269_231212, 0089_MW249_231212, 0089_MW243_231212, 0089_MW240_231212, 0089_MW238_231212, 0089_MW245_231212	**12-Dec-2023**	**19-Dec-2023**	09-Jun-2024	✓	**19-Dec-2023**	09-Jun-2024	✓
HDPE (no PTFE) (EP231X) 0089_MW496_231212, 0089_MW516_231212, 0089_MW239_231212	**12-Dec-2023**	**19-Dec-2023**	09-Jun-2024	✓	**20-Dec-2023**	09-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)							
Alkalinity by Auto Titrator	ED037-P	2	17	**11.76**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	0	9	**0.00**	**10.00**	×	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	37	**5.41**	**10.00**	×	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Alkalinity by Auto Titrator	ED037-P	2	17	**11.76**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	9	**22.22**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	37	**5.41**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Alkalinity by Auto Titrator	ED037-P	1	17	**5.88**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	1	9	**11.11**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	37	**5.41**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Chloride by Discrete Analyser	ED045G	1	9	**11.11**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	37	**2.70**	**5.00**	×	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	0	20	**0.00**	**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
Alkalinity by Auto Titrator	ED037-P	WATER	In house: Referenced to APHA 2320 B This procedure determines alkalinity by automated measurement (e.g. PC Titrate) on a settled supernatant aliquot of the sample using pH 4.5 for indicating the total alkalinity end-point. This method is compliant with NEPM Schedule B(3)
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	WATER	In house: Referenced to APHA 4500-SO4. Dissolved sulfate is determined in a 0.45um filtered sample. Sulfate ions are converted to a barium sulfate suspension in an acetic acid medium with barium chloride. Light absorbance of the BaSO4 suspension is measured by a photometer and the SO4-2 concentration is determined by comparison of the reading with a standard curve. This method is compliant with NEPM Schedule B(3)
Chloride by Discrete Analyser	ED045G	WATER	In house: Referenced to APHA 4500 Cl - G.The thiocyanate ion is liberated from mercuric thiocyanate through sequestration of mercury by the chloride ion to form non-ionised mercuric chloride. In the presence of ferric ions the liberated thiocynate forms highly-coloured ferric thiocynate which is measured at 480 nm.
Major Cations - Dissolved	ED093F	WATER	In house: Referenced to APHA 3120 and 3125; USEPA SW 846 - 6010 and 6020; Cations are determined by either ICP-AES or ICP-MS techniques. This method is compliant with NEPM Schedule B(3) Sodium Adsorption Ratio is calculated from Ca, Mg and Na which determined by ALS in house method QWI-EN/ED093F. This method is compliant with NEPM Schedule B(3) Hardness parameters are calculated based on APHA 2340 B. This method is compliant with NEPM Schedule B(3)
Ionic Balance by PCT DA and Turbi SO4 DA	* EN055 - PG	WATER	In house: Referenced to APHA 1030F. This method is compliant with NEPM Schedule B(3)
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.

Environmental Division
Perth
Work Order Reference
EP2317628

Telephone : 61-8-9406 1301

Custody Document for Submissions via ALS Compass App

Project: WA_0089_PFASDMP_23 Client: Stantec Project Manager: [redacted]
Phone:

ALS Compass COC Reference: 61436, 61380, 61459, 61461 # Samples: 1 Esky Sampler: [redacted]
Phone:

Turnaround Requirements: Standard ~~Standard~~ Urgent

Special Instructions:	ALS Use Only			
	Custody seal intact?	YES	NO	N/A
	Free ice / frozen ice bricks upon receipt?	YES	NO	N/A
	Random sample temperature on receipt?		°C	

Custody:

Relinquished by:	Received by:	Relinquished by:	Received by:
[redacted]	[redacted]		
Date / Time: 12/12/23 ~ 4:00pm	Date / Time: 13/12 1215	Date / Time:	Date / Time:

CHAIN OF CUSTODY

ALS COC#: 61456 ALS Laboratory: EP Perth Environmental

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

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP_23

SITE: Stirling GW - JS

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted] SAMPLER MOBILE [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES 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	Rinsate WATER	WA OMP Water Suite WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
001	0089_MW203		12/12/2023 08:34 AM	WATER	ALS: 5 Non ALS: 0	No		X		
002	0089_MW123		12/12/2023 08:58 AM	WATER	ALS: 3 Non ALS: 0	No		X		
003	0089_QC108		12/12/2023 08:59 AM	WATER	ALS: 3 Non ALS: 0	No		X		
004	0089_MW121		12/12/2023 09:19 AM	WATER	ALS: 3 Non ALS: 0	No		X		
005	0089_QC112		12/12/2023 09:20 AM	WATER	ALS: 3 Non ALS: 0	No		X		
006	0089_MW120		12/12/2023 09:41 AM	WATER	ALS: 3 Non ALS: 0	No		X		
007	0089_MW500		12/12/2023 10:40 AM	WATER	ALS: 5 Non ALS: 0	No		X		

CHAIN OF CUSTODY

ALS COC#: 61456 ALS Laboratory: EP Perth Environmental

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

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP_23

SITE: Stirling GW - JS

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES 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	Rinsate WATER	WA OMP Water Suite WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
008	0089_MW109		12/12/2023 10:55 AM	WATER	ALS: 5 Non ALS: 0	No		X		
009	0089_MW112		12/12/2023 11:12 AM	WATER	ALS: 3 Non ALS: 0	No		X		
010	0089_QC113		12/12/2023 11:15 AM	WATER	ALS: 3 Non ALS: 0	No		X		
011	0089_MW199		12/12/2023 11:59 AM	WATER	ALS: 5 Non ALS: 0	No		X		
012	0089_MW158		12/12/2023 01:13 PM	WATER	ALS: 3 Non ALS: 0	No		X		
013	0089_MW166		12/12/2023 02:11 PM	WATER	ALS: 3 Non ALS: 0	No		X		
014	0089_MW171		12/12/2023 02:14 PM	WATER	ALS: 3 Non ALS: 0	No		X		

CHAIN OF CUSTODY

ALS COC#: 61456 ALS Laboratory: EP Perth Environmental

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

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP_23

SITE: Stirling GW - JS

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES 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	Rinsate WATER	WA OMP Water Suite WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
015	0089_MW128		12/12/2023 02:52 PM	WATER	ALS: 3 Non ALS: 0	No		X		
016	0089_QC301		12/12/2023 02:56 PM	WATER	ALS: 2 Non ALS: 0	No	X			
017	0089_QC302		12/12/2023 02:56 PM	WATER	ALS: 2 Non ALS: 0	No	X			
018	0089_QC401		12/12/2023 02:57 PM	WATER	ALS: 2 Non ALS: 0	No	X			
019	0089_QC402		12/12/2023 02:57 PM	WATER	ALS: 2 Non ALS: 0	No	X			

CHAIN OF CUSTODY

ALS COC#: 61456 ALS Laboratory: EP Perth Environmental

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP_23

SITE: Stirling GW - JS

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted]

SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO: [redacted]

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

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	0089_MW203	Clear Plastic Bottle - Natural	125 mL	00070522229670	Green	No	
001	0089_MW203	HDPE (no PTFE)	20 mL	00352309067999	Grey	No	
001	0089_MW203	HDPE (no PTFE)	20 mL	00352309068241	Grey	No	
001	0089_MW203	HDPE (no PTFE)	20 mL	00352309068138	Grey	No	
001	0089_MW203	HDPE (no PTFE)	20 mL	00352309068032	Grey	No	
002	0089_MW123	Clear Plastic Bottle - Natural	125 mL	00070522229874	Green	No	
002	0089_MW123	HDPE (no PTFE)	20 mL	00352309068247	Grey	No	
002	0089_MW123	HDPE (no PTFE)	20 mL	00352309068189	Grey	No	
003	0089_QC108	Clear Plastic Bottle - Natural	125 mL	00070522229592	Green	No	
003	0089_QC108	HDPE (no PTFE)	20 mL	00352309067946	Grey	No	
003	0089_QC108	HDPE (no PTFE)	20 mL	00352309067985	Grey	No	
004	0089_MW121	HDPE (no PTFE)	20 mL	00352309068112	Grey	No	
004	0089_MW121	HDPE (no PTFE)	20 mL	00352309068398	Grey	No	
004	0089_MW121	Clear Plastic Bottle - Natural	125 mL	00070522229710	Green	No	
005	0089_QC112	HDPE (no PTFE)	20 mL	00352309068009	Grey	No	
005	0089_QC112	HDPE (no PTFE)	20 mL	00352309068295	Grey	No	
005	0089_QC112	Clear Plastic Bottle - Natural	125 mL	00070522229645	Green	No	
006	0089_MW120	Clear Plastic Bottle - Natural	125 mL	00070522229911	Green	No	
006	0089_MW120	HDPE (no PTFE)	20 mL	00352309068223	Grey	No	
006	0089_MW120	HDPE (no PTFE)	20 mL	00352309030046	Grey	No	
007	0089_MW500	Clear Plastic Bottle - Natural	125 mL	00070522229912	Green	No	
007	0089_MW500	HDPE (no PTFE)	20 mL	00352309067881	Grey	No	
007	0089_MW500	HDPE (no PTFE)	20 mL	00352309068151	Grey	No	
007	0089_MW500	HDPE (no PTFE)	20 mL	00352309067922	Grey	No	
007	0089_MW500	HDPE (no PTFE)	20 mL	00352309068278	Grey	No	
008	0089_MW109	Clear Plastic Bottle - Natural	125 mL	00070522229610	Green	No	

CHAIN OF CUSTODY

ALS COC#: 61456 ALS Laboratory: EP Perth Environmental

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP_23

SITE: Stirling GW - JS

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted]

QUOTE NO: SY/139/19 B

SAMPLER MOBILE: [redacted]

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO: [redacted]

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

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:

008	0089_MW109	HDPE (no PTFE)	20 mL	00352309068261	Grey	No	
008	0089_MW109	HDPE (no PTFE)	20 mL	00352309067877	Grey	No	
008	0089_MW109	HDPE (no PTFE)	20 mL	00352309068202	Grey	No	
009	0089_MW112	HDPE (no PTFE)	20 mL	00352309068120	Grey	No	
009	0089_MW112	HDPE (no PTFE)	20 mL	00352309067873	Grey	No	
009	0089_MW112	Clear Plastic Bottle - Natural	125 mL	00070522229759	Green	No	
010	0089_QC113	Clear Plastic Bottle - Natural	125 mL	00070522229528	Green	No	
010	0089_QC113	HDPE (no PTFE)	20 mL	00352309068360	Grey	No	
010	0089_QC113	HDPE (no PTFE)	20 mL	00352309068191	Grey	No	
011	0089_MW199	HDPE (no PTFE)	20 mL	00352309068130	Grey	No	
011	0089_MW199	Clear Plastic Bottle - Natural	125 mL	00070522229682	Green	No	
011	0089_MW199	HDPE (no PTFE)	20 mL	00352309067958	Grey	No	
011	0089_MW199	HDPE (no PTFE)	20 mL	00352309067974	Grey	No	
012	0089_MW158	Clear Plastic Bottle - Natural	125 mL	00070522229875	Green	No	
012	0089_MW158	HDPE (no PTFE)	20 mL	00352309067957	Grey	No	
012	0089_MW158	HDPE (no PTFE)	20 mL	00352309067904	Grey	No	
013	0089_MW166	HDPE (no PTFE)	20 mL	00352309068034	Grey	No	
013	0089_MW166	Clear Plastic Bottle - Natural	125 mL	00070522229678	Green	No	
013	0089_MW166	Clear Plastic Bottle - Natural	125 mL	00070522229671	Green	No	
014	0089_MW171	HDPE (no PTFE)	20 mL	00352309067943	Grey	No	
014	0089_MW171	HDPE (no PTFE)	20 mL	00352309068119	Grey	No	
014	0089_MW171	Clear Plastic Bottle - Natural	125 mL	00070522229717	Green	No	
015	0089_MW128	HDPE (no PTFE)	20 mL	00352309068046	Grey	No	
015	0089_MW128	HDPE (no PTFE)	20 mL	00352309067900	Grey	No	

CHAIN OF CUSTODY

COC#: 61456 *ALS Laboratory:* EP Perth Environmental

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP_23

SITE: Stirling GW - JS

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH [redacted]

QUOTE NO: SY/139/19 B

SAMPLER MOBILE [redacted] / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO: [redacted]

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

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	0089_QC301	HDPE (no PTFE)	20 mL	00352309068088	Grey	No	
016	0089_QC301	HDPE (no PTFE)	20 mL	00352309068310	Grey	No	
017	0089_QC302	HDPE (no PTFE)	20 mL	00352309068419	Grey	No	
017	0089_QC302	HDPE (no PTFE)	20 mL	00352309030071	Grey	No	
018	0089_QC401	HDPE (no PTFE)	20 mL	00351221006234	Grey	No	
018	0089_QC401	HDPE (no PTFE)	20 mL	00351221006105	Grey	No	
019	0089_QC402	HDPE (no PTFE)	20 mL	00350822058723	Grey	No	
019	0089_QC402	HDPE (no PTFE)	20 mL	00350822058790	Grey	No	

Total Bottle Count: ALS: 61, Non ALS: 0

SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : **EP2317628**

Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: Customer Services EP
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
E-mail	: [redacted]stantec.com	E-mail	: ALSEnviro.Perth@alsglobal.com
Telephone	: ----	Telephone	: +61-8-9406 1301
Facsimile	: ----	Facsimile	: +61-8-9406 1399
Project	: WA_0089_PFASOMP_23	Page	: 1 of 3
Order number	: pfas-omp/Stirling	Quote number	: ES2022MWHAUS0002 (SY/139/19 B)
C-O-C number	: 61456	QC Level	: NEPM 2013 B3 & ALS QC Standard
Site	: Stirling GW - JS		
Sampler	: [redacted]		

Dates

Date Samples Received	: 13-Dec-2023 12:15	Issue Date	: 15-Dec-2023
Client Requested Due Date	: 27-Dec-2023	Scheduled Reporting Date	: **27-Dec-2023**

Delivery Details

Mode of Delivery	: Carrier	Security Seal	: Not Available
No. of coolers/boxes	: 1	Temperature	: 11.7 - Ice present
Receipt Detail	:	No. of samples received / analysed	: 19 / 19

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 see scanned COC for sample discrepencies: extra samples , samples not received etc.
- Please direct any queries related to sample condition / numbering / breakages to Sample Receipt (Samples.Perth@alsglobal.com)
- Analytical work for this work order will be conducted at ALS Environmental Perth.
- Please direct any turnaround / technical queries to the laboratory contact designated above.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months) from receipt of samples.
- **pH analysis should be conducted within 6 hours of sampling.**
- **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.**
- 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)	WATER - NT-01 & 02 Ca, Mg, Na, K, Cl, SO4, Alkalinity
EP2317628-001	12-Dec-2023 08:34	0089_MW203_231212	✓	✓
EP2317628-002	12-Dec-2023 08:58	0089_MW123_231212	✓	✓
EP2317628-003	12-Dec-2023 08:59	0089_QC108_231212	✓	✓
EP2317628-004	12-Dec-2023 09:19	0089_MW121_231212	✓	✓
EP2317628-005	12-Dec-2023 09:20	0089_QC112_231212	✓	✓
EP2317628-006	12-Dec-2023 09:41	0089_MW120_231212	✓	✓
EP2317628-007	12-Dec-2023 10:40	0089_MW500_231212	✓	✓
EP2317628-008	12-Dec-2023 10:55	0089_MW109_231212	✓	✓
EP2317628-009	12-Dec-2023 11:12	0089_MW112_231212	✓	✓
EP2317628-010	12-Dec-2023 11:15	0089_QC113_231212	✓	✓
EP2317628-011	12-Dec-2023 11:59	0089_MW199_231212	✓	✓
EP2317628-012	12-Dec-2023 13:13	0089_MW158_231212	✓	✓
EP2317628-013	12-Dec-2023 14:11	0089_MW166_231212	✓	✓
EP2317628-014	12-Dec-2023 14:14	0089_MW171_231212	✓	✓
EP2317628-015	12-Dec-2023 14:52	0089_MW128_231212	✓	✓
EP2317628-016	12-Dec-2023 14:56	0089_QC301_231212	✓	
EP2317628-017	12-Dec-2023 14:56	0089_QC302_231212	✓	
EP2317628-018	12-Dec-2023 14:57	0089_QC401_231212	✓	
EP2317628-019	12-Dec-2023 14:57	0089_QC402_231212	✓	

Proactive Holding Time Report

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

Requested Deliverables

[redacted]
- A4 - AU Tax Invoice (INV) — Email — [redacted]cardno.com.au

DERP LAB REPORTS
- EDI Format - ESDAT (ESDAT) — Email — derp.labreports@esdat.com.au

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

CERTIFICATE OF ANALYSIS

Work Order	: **EP2317628**	Page	: 1 of 14
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: Customer Services EP
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: +61-8-9406 1301
Project	: WA_0089_PFASOMP_23	Date Samples Received	: 13-Dec-2023 12:15
Order number	: pfas-omp/Stirling	Date Analysis Commenced	: 15-Dec-2023
C-O-C number	: 61456	Issue Date	: 28-Dec-2023 15:15
Sampler	: [redacted]		
Site	: Stirling GW - JS		
Quote number	: SY/139/19 B		
No. of samples received	: 19		
No. of samples analysed	: 19		

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]	Inorganics Supervisor	Perth Inorganics, Wangara, WA
[redacted]	Senior Organic Chemist	Perth Organics, Wangara, WA

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.
- As per QWI – EN55-3 Data Interpreting Procedures, Ionic balances are typically calculated using Major Anions - Chloride, Alkalinity and Sulfate; and Major Cations - Calcium, Magnesium, Potassium and Sodium. Where applicable and dependent upon sample matrix, the Ionic Balance may also include the additional contribution of Ammonia, Dissolved Metals by ICPMS and H+ to the Cations and Nitrate, SiO2 and Fluoride to the Anions.
- Sodium Adsorption Ratio (where reported): Where results for Na, Ca or Mg are <LOR, a concentration at half the reported LOR is incorporated into the SAR calculation. This represents a conservative approach for Na relative to the assumption that <LOR = zero concentration and a conservative approach for Ca & Mg relative to the assumption that <LOR is equivalent to the LOR concentration.
- 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.
- ED045G: The presence of Thiocyanate, Thiosulfate and Sulfite can positively contribute to the chloride result, thereby may bias results higher than expected. Results should be scrutinised accordingly.

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW203_231212	0089_MW123_231212	0089_QC108_231212	0089_MW121_231212	0089_QC112_231212
				Sampling date / time	12-Dec-2023 08:34	12-Dec-2023 08:58	12-Dec-2023 08:59	12-Dec-2023 09:19	12-Dec-2023 09:20
Compound	CAS Number	LOR	Unit		EP2317628-001	EP2317628-002	EP2317628-003	EP2317628-004	EP2317628-005
					Result	Result	Result	Result	Result
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	<1	<1	<1	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	<1	<1	<1	<1
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		403	226	227	295	253
Total Alkalinity as CaCO3	---	1	mg/L		403	226	227	295	253
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		119	17	17	7	19
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		109	44	44	13	52
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		88	87	88	75	81
Magnesium	7439-95-4	1	mg/L		54	15	15	12	21
Sodium	7440-23-5	1	mg/L		93	27	27	13	34
Potassium	7440-09-7	1	mg/L		8	5	5	2	3
EN055: Ionic Balance									
ø Total Anions	---	0.01	meq/L		13.6	6.11	6.13	6.41	6.92
ø Total Cations	---	0.01	meq/L		13.1	6.88	6.93	5.35	7.32
ø Ionic Balance	---	0.01	%		1.94	5.91	6.11	9.02	2.87
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		<0.02	0.50	0.53	<0.02	<0.02
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		0.03	1.63	1.75	<0.02	0.04
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		0.07	19.0	18.3	0.08	1.53
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		<0.02	0.91	1.05	<0.02	0.22
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		<0.01	36.9	40.0	0.12	0.48
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW203_231212	0089_MW123_231212	0089_QC108_231212	0089_MW121_231212	0089_QC112_231212
				Sampling date / time	12-Dec-2023 08:34	12-Dec-2023 08:58	12-Dec-2023 08:59	12-Dec-2023 09:19	12-Dec-2023 09:20
Compound	CAS Number	LOR	Unit		EP2317628-001	EP2317628-002	EP2317628-003	EP2317628-004	EP2317628-005
					Result	Result	Result	Result	Result
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	**0.27**	**0.29**	<0.02	<0.02
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		<0.02	**1.91**	**1.94**	<0.02	**0.06**
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		<0.02	**0.26**	**0.27**	<0.02	<0.02
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		<0.01	**1.61**	**1.73**	**0.01**	**0.08**
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	**0.10**	**0.11**	<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
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									

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW203_231212	0089_MW123_231212	0089_QC108_231212	0089_MW121_231212	0089_QC112_231212
				Sampling date / time	12-Dec-2023 08:34	12-Dec-2023 08:58	12-Dec-2023 08:59	12-Dec-2023 09:19	12-Dec-2023 09:20
Compound	CAS Number	LOR	Unit		EP2317628-001	EP2317628-002	EP2317628-003	EP2317628-004	EP2317628-005
					Result	Result	Result	Result	Result
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
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		**0.10**	**63.2**	**66.1**	**0.21**	**2.41**
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		**0.07**	**55.9**	**58.3**	**0.20**	**2.01**
Sum of PFAS (WA DER List)	---	0.01	µg/L		**0.07**	**60.6**	**63.2**	**0.21**	**2.15**
EP231S: PFAS Surrogate									
13C4-PFOS	---	0.02	%		**89.7**	**87.4**	**84.4**	**99.8**	**89.6**
13C8-PFOA	---	0.02	%		**93.9**	**102**	**104**	**104**	**92.9**

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW120_231212	0089_MW500_231212	0089_MW109_231212	0089_MW112_231212	0089_QC113_231212
				Sampling date / time	12-Dec-2023 09:41	12-Dec-2023 10:40	12-Dec-2023 10:55	12-Dec-2023 11:12	12-Dec-2023 11:15
Compound	CAS Number	LOR	Unit		EP2317628-006	EP2317628-007	EP2317628-008	EP2317628-009	EP2317628-010
					Result	Result	Result	Result	Result
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	<1	<1	<1	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	<1	<1	<1	<1
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		252	322	320	217	215
Total Alkalinity as CaCO3	---	1	mg/L		252	322	320	217	215
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		15	43	21	14	14
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		53	47	67	21	20
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		81	127	105	79	79
Magnesium	7439-95-4	1	mg/L		21	17	18	9	9
Sodium	7440-23-5	1	mg/L		35	28	57	14	14
Potassium	7440-09-7	1	mg/L		3	2	<1	<1	<1
EN055: Ionic Balance									
ø Total Anions	---	0.01	meq/L		6.84	8.65	8.72	5.22	5.15
ø Total Cations	---	0.01	meq/L		7.37	9.00	9.20	5.29	5.29
ø Ionic Balance	---	0.01	%		3.71	1.99	2.68	0.69	1.34
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		0.02	1.68	0.05	0.04	0.05
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		0.04	1.40	0.11	0.11	0.12
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		1.62	22.4	0.38	4.53	4.51
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		0.23	3.69	<0.02	0.40	0.40
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		0.46	56.8	0.12	27.1	27.3
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW120_231212	0089_MW500_231212	0089_MW109_231212	0089_MW112_231212	0089_QC113_231212
				Sampling date / time	12-Dec-2023 09:41	12-Dec-2023 10:40	12-Dec-2023 10:55	12-Dec-2023 11:12	12-Dec-2023 11:15
Compound	CAS Number	LOR	Unit		EP2317628-006	EP2317628-007	EP2317628-008	EP2317628-009	EP2317628-010
					Result	Result	Result	Result	Result
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		<0.1	**0.8**	<0.1	<0.1	<0.1
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		<0.02	**0.99**	<0.02	**0.08**	**0.08**
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		**0.06**	**4.46**	**0.06**	**0.32**	**0.32**
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		<0.02	**0.44**	<0.02	**0.16**	**0.17**
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		**0.10**	**1.40**	**0.01**	**1.31**	**1.23**
Perfluorononanoic acid (PFNA)	375-95-1	0 02	µg/L		0 02	0 02	0 02	**0.04**	**0.04**
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	**0.45**	**0.44**
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
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									

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW120_231212	0089_MW500_231212	0089_MW109_231212	0089_MW112_231212	0089_QC113_231212
				Sampling date / time	12-Dec-2023 09:41	12-Dec-2023 10:40	12-Dec-2023 10:55	12-Dec-2023 11:12	12-Dec-2023 11:15
Compound	CAS Number	LOR	Unit		EP2317628-006	EP2317628-007	EP2317628-008	EP2317628-009	EP2317628-010
					Result	Result	Result	Result	Result
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
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	**0.11**	**0.11**
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		**2.53**	**94.1**	**0.73**	**34.6**	**34.8**
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		**2.08**	**79.2**	**0.50**	**31.6**	**31.8**
Sum of PFAS (WA DER List)	---	0.01	µg/L		**2.26**	**89.0**	**0.62**	**33.6**	**33.8**
EP231S: PFAS Surrogate									
13C4-PFOS	---	0.02	%		**90.0**	**103**	**106**	**97.1**	**93.4**
13C8-PFOA	---	0.02	%		**95.7**	**98.7**	**96.6**	**98.1**	**93.9**

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW199_231212	0089_MW158_231212	0089_MW166_231212	0089_MW171_231212	0089_MW128_231212
				Sampling date / time	12-Dec-2023 11:59	12-Dec-2023 13:13	12-Dec-2023 14:11	12-Dec-2023 14:14	12-Dec-2023 14:52
Compound	CAS Number	LOR	Unit		EP2317628-011	EP2317628-012	EP2317628-013	EP2317628-014	EP2317628-015
					Result	Result	Result	Result	Result
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	<1	<1	<1	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	<1	<1	<1	<1
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		913	444	440	464	389
Total Alkalinity as CaCO3	---	1	mg/L		913	444	440	464	389
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		365	452	156	530	22
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		5720	4360	923	4090	174
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		236	199	143	180	114
Magnesium	7439-95-4	1	mg/L		407	334	98	339	41
Sodium	7440-23-5	1	mg/L		3120	2350	546	2280	86
Potassium	7440-09-7	1	mg/L		134	104	48	114	6
EN055: Ionic Balance									
ø Total Anions	---	0.01	meq/L		187	141	38.1	136	13.1
ø Total Cations	---	0.01	meq/L		184	142	40.2	139	13.0
ø Ionic Balance	---	0.01	%		0.75	0.36	2.69	1.20	0.69
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		<0.02	<0.02	0.03	0.39	<0.02
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		<0.02	<0.02	0.06	0.29	<0.02
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		<0.01	<0.01	0.20	1.18	<0.01
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		<0.02	<0.02	0.03	0.04	<0.02
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		0.01	<0.01	3.30	0.03	<0.01
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW199_231212	0089_MW158_231212	0089_MW166_231212	0089_MW171_231212	0089_MW128_231212
				Sampling date / time	12-Dec-2023 11:59	12-Dec-2023 13:13	12-Dec-2023 14:11	12-Dec-2023 14:14	12-Dec-2023 14:52
Compound	CAS Number	LOR	Unit		EP2317628-011	EP2317628-012	EP2317628-013	EP2317628-014	EP2317628-015
					Result	Result	Result	Result	Result
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		<0.1	<0.1	<0.1	**0.2**	<0.1
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		<0.02	<0.02	<0.02	**0.14**	<0.02
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		<0.02	<0.02	**0.03**	**0.63**	<0.02
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		<0.02	<0.02	<0.02	**0.04**	<0.02
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		<0.01	<0.01	**0.02**	**0.03**	<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
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									

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW199_231212	0089_MW158_231212	0089_MW166_231212	0089_MW171_231212	0089_MW128_231212
				Sampling date / time	12-Dec-2023 11:59	12-Dec-2023 13:13	12-Dec-2023 14:11	12-Dec-2023 14:14	12-Dec-2023 14:52
Compound	CAS Number	LOR	Unit		EP2317628-011	EP2317628-012	EP2317628-013	EP2317628-014	EP2317628-015
					Result	Result	Result	Result	Result
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
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	**3.67**	**2.97**	<0.01
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		**0.01**	<0.01	**3.50**	**1.21**	<0.01
Sum of PFAS (WA DER List)	---	0.01	µg/L		**0.01**	<0.01	**3.58**	**2.64**	<0.01
EP231S: PFAS Surrogate									
13C4-PFOS	---	0.02	%		**95.0**	**100**	**95.5**	**104**	**90.9**
13C8-PFOA	---	0.02	%		**96.4**	**98.9**	**101**	**94.0**	**96.0**

Analytical Results

Sub-Matrix: RINSATE (Matrix: WATER)				Sample ID	0089_QC301_231212	0089_QC302_231212	0089_QC401_231212	0089_QC402_231212	----
				Sampling date / time	12-Dec-2023 14:56	12-Dec-2023 14:56	12-Dec-2023 14:57	12-Dec-2023 14:57	----
Compound	CAS Number	LOR	Unit		EP2317628-016	EP2317628-017	EP2317628-018	EP2317628-019	--------
					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		<0.01	<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	----
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		<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	----
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		<0.02	<0.02	<0.02	<0.02	----
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
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	----

Analytical Results

Sub-Matrix: RINSATE (Matrix: WATER)				Sample ID	0089_QC301_231212	0089_QC302_231212	0089_QC401_231212	0089_QC402_231212	----
				Sampling date / time	12-Dec-2023 14:56	12-Dec-2023 14:56	12-Dec-2023 14:57	12-Dec-2023 14:57	----
Compound	CAS Number	LOR	Unit		EP2317628-016	EP2317628-017	EP2317628-018	EP2317628-019	--------
					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	----
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		<0.01	<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	----
Sum of PFAS (WA DER List)	---	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	----
EP231S: PFAS Surrogate									
13C4-PFOS	---	0.02	%		**101**	**102**	**101**	**103**	----
13C8-PFOA	---	0.02	%		**98.4**	**103**	**97.7**	**91.9**	----

Surrogate Control Limits

Sub-Matrix: GROUNDWATER		Recovery Limits (%)	
Compound	CAS Number	Low	High
EP231S: PFAS Surrogate			
13C4-PFOS	---	65	140
13C8-PFOA	---	71	133

Sub-Matrix: RINSATE		Recovery Limits (%)	
Compound	CAS Number	Low	High
EP231S: PFAS Surrogate			
13C4-PFOS	---	65	140
13C8-PFOA	---	71	133

QUALITY CONTROL REPORT

Work Order	: **EP2317628**	Page	: 1 of 12
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: Customer Services EP
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: +61-8-9406 1301
Project	: WA_0089_PFASOMP_23	Date Samples Received	: 13-Dec-2023
Order number	: pfas-omp/Stirling	Date Analysis Commenced	: 15-Dec-2023
C-O-C number	: 61456	Issue Date	: 28-Dec-2023
Sampler	: [redacted] [redacted]		
Site	: Stirling GW - JS		
Quote number	: SY/139/19 B		
No. of samples received	: 19		
No. of samples analysed	: 19		

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]	Inorganics Supervisor	Perth Inorganics, Wangara, WA
[redacted]	Senior Organic Chemist	Perth Organics, Wangara, WA

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 (%)
ED037P: Alkalinity by PC Titrator (QC Lot: 5501070)									
EP2317628-002	0089_MW123_231212	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	226	227	0.0	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	226	227	0.0	0% - 20%
EP2317628-012	0089_MW158_231212	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	444	447	0.9	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	444	447	0.9	0% - 20%
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QC Lot: 5507746)									
EP2317628-001	0089_MW203_231212	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	119	114	4.8	0% - 20%
EP2317628-011	0089_MW199_231212	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	365	363	0.5	0% - 20%
ED045G: Chloride by Discrete Analyser (QC Lot: 5507747)									
EP2317628-001	0089_MW203_231212	ED045G: Chloride	16887-00-6	1	mg/L	109	111	1.4	0% - 20%
EP2317628-011	0089_MW199_231212	ED045G: Chloride	16887-00-6	1	mg/L	5720	5670	0.9	0% - 20%
ED093F: Dissolved Major Cations (QC Lot: 5500558)									
EP2317627-001	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	201	201	0.0	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	255	255	0.0	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	1650	1630	1.0	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	87	86	1.2	0% - 20%
EP2317628-002	0089_MW123_231212	ED093F Calcium	7440-70-2	1	mg/L	87	89	2.4	0% - 20%

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 (%)
ED093F: Dissolved Major Cations (QC Lot: 5500558) - continued									
EP2317628-002	0089_MW123_231212	ED093F: Magnesium	7439-95-4	1	mg/L	15	15	0.0	0% - 50%
		ED093F: Sodium	7440-23-5	1	mg/L	27	27	0.0	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	5	5	0.0	No Limit
ED093F: Dissolved Major Cations (QC Lot: 5500559)									
EP2317628-012	0089_MW158_231212	ED093F: Calcium	7440-70-2	1	mg/L	199	200	0.0	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	334	337	0.9	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	2350	2380	1.4	0% - 20%
		ED093F: Potassium	7440 09 7	1	mg/L	104	107	2 4	0% 20%
EP2317629-007	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	449	454	1.0	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	1440	1460	1.4	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	11600	11700	1.3	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	565	571	1.1	0% - 20%
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 5502773)									
EP2317628-001	0089_MW203_231212	EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	0.07	0.07	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	0.03	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: 5502775)									
EP2317628-008	0089_MW109_231212	EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	0.38	0.38	0.0	0% - 20%
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	0.12	0.10	11.4	0% - 50%
		EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	0.05	0.06	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	0.11	0.11	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: 5502975)									
EP2317628-007	0089_MW500_231212	EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01 (0.04)*	µg/L	22.4	19.0	16.3	0% - 20%
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01 (0.04)*	µg/L	56.8	48.0	16.8	0% - 20%
		EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	1.68	1.60	5.4	0% - 20%
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02 (0.04)*	µg/L	1.40	1.15	19.0	0% - 20%
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	3.69	3.46	6.3	0% - 20%
		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: 5502773)									
EP2317628-001	0089_MW203_231212	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

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 (%)
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 5502773) - continued									
EP2317628-001	0089_MW203_231212	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: 5502775)									
EP2317628-008	0089_MW109_231212	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	0.06	0.06	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: 5502975)									
EP2317628-007	0089_MW500_231212	EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	1.40	1.28	8.3	0% - 20%
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	0.99	0.88	12.1	0% - 20%
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	4.46	3.73	17.7	0% - 20%
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	0.44	0.41	6.1	0% - 20%
		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	0.8	0.7	0.0	No Limit
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 5502773)									
EP2317628-001	0089_MW203_231212	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 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: 5502773) - continued									
EP2317628-001	0089_MW203_231212	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: 5502775)									
EP2317628-008	0089_MW109_231212	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: 5502975)									
EP2317628-007	0089_MW500_231212	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: 5502773)									
EP2317628-001	0089_MW203_231212	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: 5502773) - continued									
EP2317628-001	0089_MW203_231212	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: 5502775)									
EP2317628-008	0089_MW109_231212	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: 5502975)									
EP2317628-007	0089_MW500_231212	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: 5502773)									
EP2317628-001	0089_MW203_231212	EP231X: Sum of PFAS	----	0.01	µg/L	0.10	0.09	10.5	0% - 50%
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	0.07	0.07	0.0	No Limit
		EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	0.07	0.07	0.0	No Limit
EP231P: PFAS Sums (QC Lot: 5502775)									
EP2317628-008	0089_MW109_231212	EP231X: Sum of PFAS	----	0.01	µg/L	0.73	0.72	1.4	0% - 20%
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	0.50	0.48	4.1	0% - 20%
		EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	0.62	0.61	1.6	0% - 20%
EP231P: PFAS Sums (QC Lot: 5502975)									
EP2317628-007	0089_MW500_231212	EP231X: Sum of PFAS	----	0.01 (0.04)*	µg/L	94.1	80.2	15.9	0% - 20%
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01 (0.04)*	µg/L	79.2	67.0	16.7	0% - 20%
		EP231X: Sum of PFAS (WA DER List)	----	0.01 (0.04)*	µg/L	89.0	75.6	16.2	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
ED037P: Alkalinity by PC Titrator (QCLot: 5501070)								
ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	---	---	---	---
ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	---	---	---	---
ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	<1	---	---	---	---
ED037-P: Total Alkalinity as CaCO3	---	1	mg/L	<1	20 mg/L	95.2	85.1	126
				<1	200 mg/L	97.3	90.5	111
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 5507746)								
ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<1	25 mg/L	99.0	89.9	112
				<1	500 mg/L	96.9	89.9	112
ED045G: Chloride by Discrete Analyser (QCLot: 5507747)								
ED045G: Chloride	16887-00-6	1	mg/L	<1	10 mg/L	93.2	88.6	113
				<1	1000 mg/L	97.1	88.6	113
ED093F: Dissolved Major Cations (QCLot: 5500558)								
ED093F: Calcium	7440-70-2	1	mg/L	<1	50 mg/L	101	86.5	117
ED093F: Magnesium	7439-95-4	1	mg/L	<1	50 mg/L	100	88.4	110
ED093F: Sodium	7440-23-5	1	mg/L	<1	50 mg/L	98.4	91.4	113
ED093F: Potassium	7440-09-7	1	mg/L	<1	50 mg/L	96.3	84.6	108
ED093F: Dissolved Major Cations (QCLot: 5500559)								
ED093F: Calcium	7440-70-2	1	mg/L	<1	50 mg/L	100.0	86.5	117
ED093F: Magnesium	7439-95-4	1	mg/L	<1	50 mg/L	99.0	88.4	110
ED093F: Sodium	7440-23-5	1	mg/L	<1	50 mg/L	96.7	91.4	113
ED093F: Potassium	7440-09-7	1	mg/L	<1	50 mg/L	95.3	84.6	108
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5502773)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.2218 µg/L	92.9	72.0	130
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.2352 µg/L	108	71.0	127
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	0.2373 µg/L	92.7	68.0	131
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.238 µg/L	102	69.0	134
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.232 µg/L	97.2	65.0	140
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.241 µg/L	92.7	53.0	142
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5502775)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.2218 µg/L	97.8	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
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5502775) - continued								
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.2352 µg/L	111	71.0	127
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	0.2373 µg/L	97.1	68.0	131
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.238 µg/L	93.7	69.0	134
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.232 µg/L	88.4	65.0	140
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.241 µg/L	88.0	53.0	142
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5502975)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.2218 µg/L	96.2	72.0	130
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.2352 µg/L	101	71.0	127
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	0.2373 µg/L	94.2	68.0	131
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.238 µg/L	92.8	69.0	134
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.232 µg/L	90.1	65.0	140
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.241 µg/L	86.5	53.0	142
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5502773)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	1.25 µg/L	95.1	73.0	129
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	0.25 µg/L	93.2	72.0	129
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	0.25 µg/L	103	72.0	129
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	0.25 µg/L	101	72.0	130
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	0.25 µg/L	105	71.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	0.25 µg/L	94.6	69.0	130
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	0.25 µg/L	93.4	71.0	129
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	0.25 µg/L	88.2	69.0	133
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	0.25 µg/L	99.4	72.0	134
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	0.25 µg/L	102	65.0	144
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	0.25 µg/L	100	71.0	132
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5502775)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	1.25 µg/L	98.2	73.0	129
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	0.25 µg/L	91.2	72.0	129
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	0.25 µg/L	103	72.0	129
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	0.25 µg/L	101	72.0	130
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	0.25 µg/L	111	71.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	0.25 µg/L	117	69.0	130
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	0.25 µg/L	89.6	71.0	129
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	0.25 µg/L	95.8	69.0	133
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	0.25 µg/L	101	72.0	134

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
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5502775) - continued								
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	0.25 µg/L	94.6	65.0	144
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	0.25 µg/L	98.0	71.0	132
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5502975)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	1.25 µg/L	94.4	73.0	129
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	0.25 µg/L	98.6	72.0	129
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	0.25 µg/L	88.4	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
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	87.8	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	118	69.0	133
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	0.25 µg/L	88.8	72.0	134
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	0.25 µg/L	90.0	65.0	144
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	0.25 µg/L	104	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5502773)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.25 µg/L	82.0	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	92.4	60.5	138
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	0.625 µg/L	91.4	68.3	134
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	0.625 µg/L	104	62.2	138
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	0.25 µg/L	98.4	65.0	136
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	0.25 µg/L	104	61.0	135
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5502775)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.25 µg/L	70.4	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	0.625 µg/L	113	68.0	141
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	0.625 µg/L	106	60.5	138
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	0.625 µg/L	90.3	68.3	134
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	0.625 µg/L	110	62.2	138
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	0.25 µg/L	101	65.0	136

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: 5502775) - continued								
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	0.25 µg/L	79.6	61.0	135
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5502975)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.25 µg/L	95.6	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	0.625 µg/L	104	68.0	141
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	0.625 µg/L	78.3	60.5	138
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	0.625 µg/L	113	68.3	134
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	0.625 µg/L	92.8	62.2	138
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	0.25 µg/L	88.4	65.0	136
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	0.25 µg/L	108	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5502773)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.2343 µg/L	110	63.0	143
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	0.2378 µg/L	117	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	0.24 µg/L	115	67.0	138
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	0.241 µg/L	98.1	64.2	133
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5502775)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.2343 µg/L	101	63.0	143
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	0.2378 µg/L	94.4	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	0.24 µg/L	105	67.0	138
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	0.241 µg/L	78.6	64.2	133
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5502975)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.2343 µg/L	96.2	63.0	143
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	0.2378 µg/L	91.2	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	0.24 µg/L	86.4	67.0	138
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	0.241 µg/L	83.4	64.2	133
EP231P: PFAS Sums (QCLot: 5502773)								
EP231X: Sum of PFAS	---	0.01	µg/L	<0.01	---	---	---	---
EP231X: Sum of PFHxS and PFOS	355-46-4/17 63-23-1	0.01	µg/L	<0.01	---	---	---	---
EP231X: Sum of PFAS (WA DER List)	---	0.01	µg/L	<0.01	---	---	---	---
EP231P: PFAS Sums (QCLot: 5502775)								
EP231X: Sum of PFAS	---	0.01	µg/L	<0.01	---	---	---	---

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
EP231P: PFAS Sums (QCLot: 5502775) - continued								
EP231X: Sum of PFHxS and PFOS	355-46-4/17 63-23-1	0.01	µg/L	<0.01	---	---	---	---
EP231X: Sum of PFAS (WA DER List)	---	0.01	µg/L	<0.01	---	---	---	---
EP231P: PFAS Sums (QCLot: 5502975)								
EP231X: Sum of PFAS	---	0.01	µg/L	<0.01	---	---	---	---
EP231X: Sum of PFHxS and PFOS	355-46-4/17 63-23-1	0.01	µg/L	<0.01	---	---	---	---
EP231X: Sum of PFAS (WA DER List)	---	0.01	µg/L	<0.01	---	---	---	---

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
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 5507746)							
EP2317628-001	0089_MW203_231212	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	100 mg/L	122	70.4	130
ED045G: Chloride by Discrete Analyser (QCLot: 5507747)							
EP2317628-001	0089_MW203_231212	ED045G: Chloride	16887-00-6	200 mg/L	110	70.0	130
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5502975)							
EP2317628-011	0089_MW199_231212	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.2218 µg/L	93.5	72.0	129
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.232 µg/L	114	71.0	127
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.2352 µg/L	86.5	68.0	129
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.238 µg/L	91.6	69.0	134
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.232 µg/L	95.1	65.0	140
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.241 µg/L	80.1	53.0	129
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5502975)							
EP2317628-011	0089_MW199_231212	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	1.25 µg/L	97.5	73.0	142
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.25 µg/L	93.8	72.0	129
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.25 µg/L	97.2	72.0	129
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.25 µg/L	86.6	72.0	130
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.25 µg/L	98.4	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	103	71.0	134
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.25 µg/L	118	69.0	133
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.25 µg/L	91.0	72.0	134

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: 5502975) - continued							
EP2317628-011	0089_MW199_231212	EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.25 µg/L	90.6	65.0	144
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.25 µg/L	106	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5502975)							
EP2317628-011	0089_MW199_231212	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.25 µg/L	99.4	59.0	135
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.625 µg/L	88.0	70.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.625 µg/L	74.0	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.625 µg/L	98.1	70.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.625 µg/L	79.7	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.25 µg/L	86.8	65.0	136
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.25 µg/L	98.8	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5502975)							
EP2317628-011	0089_MW199_231212	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.234 µg/L	98.1	63.0	143
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.2378 µg/L	84.8	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.24 µg/L	83.1	67.0	138
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.2415 µg/L	88.2	70.0	130

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **EP2317628**	Page	: 1 of 7
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Telephone	: +61-8-9406 1301
Project	: WA_0089_PFASOMP_23	Date Samples Received	: 13-Dec-2023
Site	: Stirling GW - JS	Issue Date	: 28-Dec-2023
Sampler	: [redacted] [redacted]	No. of samples received	: 19
Order number	: pfas-omp/Stirling	No. of samples analysed	: 19

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	52	5.77	10.00	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)						
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	52	1.92	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*			*Analysis*		
			Date extracted	*Due for extraction*	*Evaluation*	*Date analysed*	*Due for analysis*	*Evaluation*
ED037P: Alkalinity by PC Titrator								
Clear Plastic Bottle - Natural (ED037-P)								
0089_MW203_231212,	0089_MW123_231212,	**12-Dec-2023**	**----**	----	----	**18-Dec-2023**	26-Dec-2023	✓
0089_QC108_231212,	0089_MW121_231212,							
0089_QC112_231212,	0089_MW120_231212,							
0089_MW500_231212,	0089_MW109_231212,							
0089_MW112_231212,	0089_QC113_231212,							
0089_MW199_231212,	0089_MW158_231212,							
0089_MW166_231212,	0089_MW171_231212,							
0089_MW128_231212								
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA								
Clear Plastic Bottle - Natural (ED041G)								
0089_MW203_231212,	0089_MW123_231212,	**12-Dec-2023**	**----**	----	----	**23-Dec-2023**	09-Jan-2024	✓
0089_QC108_231212,	0089_MW121_231212,							
0089_QC112_231212,	0089_MW120_231212,							
0089_MW500_231212,	0089_MW109_231212,							
0089_MW112_231212,	0089_QC113_231212,							
0089_MW199_231212,	0089_MW158_231212,							
0089_MW166_231212,	0089_MW171_231212,							
0089_MW128_231212								

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
ED045G: Chloride by Discrete Analyser							
Clear Plastic Bottle - Natural (ED045G)							
0089_MW203_231212, 0089_MW123_231212, 0089_QC108_231212, 0089_MW121_231212, 0089_QC112_231212, 0089_MW120_231212, 0089_MW500_231212, 0089_MW109_231212, 0089_MW112_231212, 0089_QC113_231212, 0089_MW199_231212, 0089_MW158_231212, 0089_MW166_231212, 0089_MW171_231212, 0089_MW128_231212	**12-Dec-2023**	**----**	----	----	**23-Dec-2023**	09-Jan-2024	✓
ED093F: Dissolved Major Cations							
Clear Plastic Bottle - Natural (ED093F)							
0089_MW203_231212, 0089_MW123_231212, 0089_QC108_231212, 0089_MW121_231212, 0089_QC112_231212, 0089_MW120_231212, 0089_MW500_231212, 0089_MW109_231212, 0089_MW112_231212, 0089_QC113_231212, 0089_MW199_231212, 0089_MW158_231212, 0089_MW166_231212, 0089_MW171_231212, 0089_MW128_231212	**12-Dec-2023**	**----**	----	----	**19-Dec-2023**	19-Dec-2023	✓
EP231A: Perfluoroalkyl Sulfonic Acids							
HDPE (no PTFE) (EP231X)							
0089_MW203_231212, 0089_QC112_231212, 0089_MW120_231212, 0089_MW109_231212, 0089_MW158_231212, 0089_MW171_231212, 0089_QC301_231212, 0089_QC302_231212, 0089_QC401_231212, 0089_QC402_231212	**12-Dec-2023**	**19-Dec-2023**	09-Jun-2024	✓	**19-Dec-2023**	09-Jun-2024	✓
HDPE (no PTFE) (EP231X)							
0089_MW123_231212, 0089_QC108_231212, 0089_MW121_231212, 0089_MW500_231212, 0089_MW112_231212, 0089_QC113_231212, 0089_MW199_231212, 0089_MW166_231212, 0089_MW128_231212	**12-Dec-2023**	**19-Dec-2023**	09-Jun-2024	✓	**20-Dec-2023**	09-Jun-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)							
0089_MW203_231212, 0089_QC112_231212, 0089_MW120_231212, 0089_MW109_231212, 0089_MW158_231212, 0089_MW171_231212, 0089_QC301_231212, 0089_QC302_231212, 0089_QC401_231212, 0089_QC402_231212	**12-Dec-2023**	**19-Dec-2023**	09-Jun-2024	✓	**19-Dec-2023**	09-Jun-2024	✓
HDPE (no PTFE) (EP231X)							
0089_MW123_231212, 0089_QC108_231212, 0089_MW121_231212, 0089_MW500_231212, 0089_MW112_231212, 0089_QC113_231212, 0089_MW199_231212, 0089_MW166_231212, 0089_MW128_231212	**12-Dec-2023**	**19-Dec-2023**	09-Jun-2024	✓	**20-Dec-2023**	09-Jun-2024	✓
EP231C: Perfluoroalkyl Sulfonamides							
HDPE (no PTFE) (EP231X)							
0089_MW203_231212, 0089_QC112_231212, 0089_MW120_231212, 0089_MW109_231212, 0089_MW158_231212, 0089_MW171_231212, 0089_QC301_231212, 0089_QC302_231212, 0089_QC401_231212, 0089_QC402_231212	**12-Dec-2023**	**19-Dec-2023**	09-Jun-2024	✓	**19-Dec-2023**	09-Jun-2024	✓
HDPE (no PTFE) (EP231X)							
0089_MW123_231212, 0089_QC108_231212, 0089_MW121_231212, 0089_MW500_231212, 0089_MW112_231212, 0089_QC113_231212, 0089_MW199_231212, 0089_MW166_231212, 0089_MW128_231212	**12-Dec-2023**	**19-Dec-2023**	09-Jun-2024	✓	**20-Dec-2023**	09-Jun-2024	✓
EP231D: (n:2) Fluorotelomer Sulfonic Acids							
HDPE (no PTFE) (EP231X)							
0089_MW203_231212, 0089_QC112_231212, 0089_MW120_231212, 0089_MW109_231212, 0089_MW158_231212, 0089_MW171_231212, 0089_QC301_231212, 0089_QC302_231212, 0089_QC401_231212, 0089_QC402_231212	**12-Dec-2023**	**19-Dec-2023**	09-Jun-2024	✓	**19-Dec-2023**	09-Jun-2024	✓
HDPE (no PTFE) (EP231X)							
0089_MW123_231212, 0089_QC108_231212, 0089_MW121_231212, 0089_MW500_231212, 0089_MW112_231212, 0089_QC113_231212, 0089_MW199_231212, 0089_MW166_231212, 0089_MW128_231212	**12-Dec-2023**	**19-Dec-2023**	09-Jun-2024	✓	**20-Dec-2023**	09-Jun-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)							
0089_MW203_231212, 0089_QC112_231212, 0089_MW120_231212, 0089_MW109_231212, 0089_MW158_231212, 0089_MW171_231212, 0089_QC301_231212, 0089_QC302_231212, 0089_QC401_231212, 0089_QC402_231212	**12-Dec-2023**	**19-Dec-2023**	09-Jun-2024	✓	**19-Dec-2023**	09-Jun-2024	✓
HDPE (no PTFE) (EP231X)							
0089_MW123_231212, 0089_QC108_231212, 0089_MW121_231212, 0089_MW500_231212, 0089_MW112_231212, 0089_QC113_231212, 0089_MW199_231212, 0089_MW166_231212, 0089_MW128_231212	**12-Dec-2023**	**19-Dec-2023**	09-Jun-2024	✓	**20-Dec-2023**	09-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)							
Alkalinity by Auto Titrator	ED037-P	2	15	**13.33**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	4	32	**12.50**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	3	52	**5.77**	**10.00**	×	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Alkalinity by Auto Titrator	ED037-P	2	15	**13.33**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	2	32	**6.25**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	3	52	**5.77**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Alkalinity by Auto Titrator	ED037-P	1	15	**6.67**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	2	32	**6.25**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	3	52	**5.77**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Chloride by Discrete Analyser	ED045G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	52	**1.92**	**5.00**	×	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	20	**5.00**	**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
Alkalinity by Auto Titrator	ED037-P	WATER	In house: Referenced to APHA 2320 B This procedure determines alkalinity by automated measurement (e.g. PC Titrate) on a settled supernatant aliquot of the sample using pH 4.5 for indicating the total alkalinity end-point. This method is compliant with NEPM Schedule B(3)
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	WATER	In house: Referenced to APHA 4500-SO4. Dissolved sulfate is determined in a 0.45um filtered sample. Sulfate ions are converted to a barium sulfate suspension in an acetic acid medium with barium chloride. Light absorbance of the BaSO4 suspension is measured by a photometer and the SO4-2 concentration is determined by comparison of the reading with a standard curve. This method is compliant with NEPM Schedule B(3)
Chloride by Discrete Analyser	ED045G	WATER	In house: Referenced to APHA 4500 Cl - G.The thiocyanate ion is liberated from mercuric thiocyanate through sequestration of mercury by the chloride ion to form non-ionised mercuric chloride. In the presence of ferric ions the liberated thiocynate forms highly-coloured ferric thiocynate which is measured at 480 nm.
Major Cations - Dissolved	ED093F	WATER	In house: Referenced to APHA 3120 and 3125; USEPA SW 846 - 6010 and 6020; Cations are determined by either ICP-AES or ICP-MS techniques. This method is compliant with NEPM Schedule B(3) Sodium Adsorption Ratio is calculated from Ca, Mg and Na which determined by ALS in house method QWI-EN/ED093F. This method is compliant with NEPM Schedule B(3) Hardness parameters are calculated based on APHA 2340 B. This method is compliant with NEPM Schedule B(3)
Ionic Balance by PCT DA and Turbi SO4 DA	* EN055 - PG	WATER	In house: Referenced to APHA 1030F. This method is compliant with NEPM Schedule B(3)
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.

Environmental Division
Perth
Work Order Reference
EP2317629

Telephone - 61-8-9406 1301

ALSCompass
SAMPLING Intelligence

Custody Document for Submissions via ALS Compass App

Project: WA_0089_PFASDMP_23 Client: Stantec Project Manage [redacted]
Phone:
Sampler: [redacted]
ALS Compass COC Reference: 61456, 61386, 61459, 61461 # Samples: 4 Eskies. Phone:
Turnaround Requirements: Standard Urgent

Special Instructions:	ALS Use Only			
	Custody seal intact?	YES	NO	N/A
	Free ice / frozen ice bricks upon receipt?	YES	NO	N/A
	Random sample temperature on receipt?		°C	

Custody:	Received by:	Relinquished by:	Received by:
Re [redacted]	[redacted]		
Date / Time: 12/12/23 ~ 3:00pm	Date / Time: 13/12 1215	Date / Time:	Date / Time:

CHAIN OF CUSTODY

COC#: 61459 *ALS Laboratory:* EP Perth Environmental

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

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP_23

SITE: Stirling SW/PW - AH

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER [redacted]

PRIMARY SAMPLER: [redacted]

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO: [redacted]

CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

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	WA OMP Water Suite WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
001	0089_SW318		12/12/2023 09:22 AM	WATER	ALS: 3 Non ALS: 0	No	X		
002	0089_QC109		12/12/2023 09:23 AM	WATER	ALS: 3 Non ALS: 0	No	X		
003	0089_SW319		12/12/2023 09:23 AM	WATER	ALS: 3 Non ALS: 0	No	X		
004	0089_SW317		12/12/2023 09:24 AM	WATER	ALS: 3 Non ALS: 0	No	X		
005	0089_PW374		12/12/2023 09:25 AM	WATER	ALS: 3 Non ALS: 0	No	X		
006	0089_PW378		12/12/2023 09:25 AM	WATER	ALS: 3 Non ALS: 0	No	X		
007	0089_PW375		12/12/2023 09:26 AM	WATER	ALS: 3 Non ALS: 0	No	X		

CHAIN OF CUSTODY

COC#: **61459** *ALS Laboratory:* EP Perth Environmental

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

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP_23

SITE: Stirling SW/PW - AH

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES 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	WA OMP Water Suite WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
008	0089_QC110		12/12/2023 09:27 AM	WATER	ALS: 3 Non ALS: 0	No	X		

CHAIN OF CUSTODY

COC#: 61459 *ALS Laboratory:* EP Perth Environmental

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

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP_23

SITE: Stirling SW/PW - AH

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO: [redacted]

CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

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	0089_SW318	Clear Plastic Bottle - Natural	125 mL	00070522229558	Green	No	
001	0089_SW318	HDPE (no PTFE)	20 mL	00352309067945	Grey	No	
001	0089_SW318	HDPE (no PTFE)	20 mL	00352309068408	Grey	No	
002	0089_QC109	Clear Plastic Bottle - Natural	125 mL	00070522229687	Green	No	
002	0089_QC109	HDPE (no PTFE)	20 mL	00352309068260	Grey	No	
002	0089_QC109	HDPE (no PTFE)	20 mL	00352309067961	Grey	No	
003	0089_SW319	Clear Plastic Bottle - Natural	125 mL	00070522229731	Green	No	
003	0089_SW319	HDPE (no PTFE)	20 mL	00352309068177	Grey	No	
003	0089_SW319	HDPE (no PTFE)	20 mL	00352309067925	Grey	No	
004	0089_SW317	HDPE (no PTFE)	20 mL	00352309067895	Grey	No	
004	0089_SW317	Clear Plastic Bottle - Natural	125 mL	00070522229850	Green	No	
004	0089_SW317	Clear Plastic Bottle - Natural	125 mL	00070522229949	Green	No	
005	0089_PW374	HDPE (no PTFE)	20 mL	00352309067935	Grey	No	
005	0089_PW374	HDPE (no PTFE)	20 mL	00352309067894	Grey	No	
005	0089_PW374	HDPE (no PTFE)	20 mL	00352309068035	Grey	No	
006	0089_PW378	Clear Plastic Bottle - Natural	125 mL	00070522229635	Green	No	
006	0089_PW378	HDPE (no PTFE)	20 mL	00352309067913	Grey	No	
006	0089_PW378	Clear Plastic Bottle - Natural	125 mL	00070522229603	Green	No	
007	0089_PW375	HDPE (no PTFE)	20 mL	00352309067878	Grey	No	
007	0089_PW375	HDPE (no PTFE)	20 mL	00352309068215	Grey	No	
007	0089_PW375	Clear Plastic Bottle - Natural	125 mL	00070522229517	Green	No	
008	0089_QC110	HDPE (no PTFE)	20 mL	00352309068388	Grey	No	
008	0089_QC110	HDPE (no PTFE)	20 mL	00352309067983	Grey	No	
008	0089_QC110						

Total Bottle Count: ALS: 24, Non ALS: 0

SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : **EP2317629**

Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: Customer Services EP
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
E-mail	: [redacted]stantec.com	E-mail	: ALSEnviro.Perth@alsglobal.com
Telephone	: ----	Telephone	: +61-8-9406 1301
Facsimile	: ----	Facsimile	: +61-8-9406 1399
Project	: WA_0089_PFASOMP_23	Page	: 1 of 2
Order number	: pfas-omp/Stirling	Quote number	: ES2022MWHAUS0002 (SY/139/19 B)
C-O-C number	: 61459	QC Level	: NEPM 2013 B3 & ALS QC Standard
Site	: Stirling SW/PW - AH		
Sampler	: [redacted]		

Dates

Date Samples Received	: 13-Dec-2023 12:15	Issue Date	: 15-Dec-2023
Client Requested Due Date	: 27-Dec-2023	Scheduled Reporting Date	: **27-Dec-2023**

Delivery Details

Mode of Delivery	: Carrier	Security Seal	: Not Available
No. of coolers/boxes	: 1	Temperature	: 11.7 - Ice present
Receipt Detail	:	No. of samples received / analysed	: 8 / 8

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 see scanned COC for sample discrepencies: extra samples , samples not received etc.
- Please direct any queries related to sample condition / numbering / breakages to Sample Receipt (Samples.Perth@alsglobal.com)
- Analytical work for this work order will be conducted at ALS Environmental Perth.
- Please direct any turnaround / technical queries to the laboratory contact designated above.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months) from receipt of samples.
- **pH analysis should be conducted within 6 hours of sampling.**
- **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.**
- 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)	WATER - NT-01 & 02 Ca, Mg, Na, K, Cl, SO4, Alkalinity
EP2317629-001	12-Dec-2023 09:22	0089_SW318_231212	✓	✓
EP2317629-002	12-Dec-2023 09:23	0089_QC109_231212	✓	✓
EP2317629-003	12-Dec-2023 09:23	0089_SW319_231212	✓	✓
EP2317629-004	12-Dec-2023 09:24	0089_SW317_231212	✓	✓
EP2317629-005	12-Dec-2023 09:25	0089_PW374_231212	✓	✓
EP2317629-006	12-Dec-2023 09:25	0089_PW378_231212	✓	✓
EP2317629-007	12-Dec-2023 09:26	0089_PW375_231212	✓	✓
EP2317629-008	12-Dec-2023 09:27	0089_QC110_231212	✓	✓

Proactive Holding Time Report

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

Requested Deliverables

[redacted]
- A4 - AU Tax Invoice (INV) — Email — [redacted]cardno.com.au

DERP LAB REPORTS
- EDI Format - ESDAT (ESDAT) — Email — derp.labreports@esdat.com.au

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

CERTIFICATE OF ANALYSIS

Work Order	: **EP2317629**	Page	: 1 of 9
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: Customer Services EP
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: +61-8-9406 1301
Project	: WA_0089_PFASOMP_23	Date Samples Received	: 13-Dec-2023 12:15
Order number	: pfas-omp/Stirling	Date Analysis Commenced	: 15-Dec-2023
C-O-C number	: 61459	Issue Date	: 27-Dec-2023 17:32
Sampler	: [redacted]		
Site	: Stirling SW/PW - AH		
Quote number	: SY/139/19 B		
No. of samples received	: 8		
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]	Inorganics Supervisor	Perth Inorganics, Wangara, WA
[redacted]	Senior Organic Chemist	Perth Organics, Wangara, WA

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.
- As per QWI – EN55-3 Data Interpreting Procedures, Ionic balances are typically calculated using Major Anions - Chloride, Alkalinity and Sulfate; and Major Cations - Calcium, Magnesium, Potassium and Sodium. Where applicable and dependent upon sample matrix, the Ionic Balance may also include the additional contribution of Ammonia, Dissolved Metals by ICPMS and H+ to the Cations and Nitrate, SiO2 and Fluoride to the Anions.
- Sodium Adsorption Ratio (where reported): Where results for Na, Ca or Mg are <LOR, a concentration at half the reported LOR is incorporated into the SAR calculation. This represents a conservative approach for Na relative to the assumption that <LOR = zero concentration and a conservative approach for Ca & Mg relative to the assumption that <LOR is equivalent to the LOR concentration.
- 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.
- ED045G: The presence of Thiocyanate, Thiosulfate and Sulfite can positively contribute to the chloride result, thereby may bias results higher than expected. Results should be scrutinised accordingly.

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_SW318_231212	0089_QC109_231212	0089_SW319_231212	0089_SW317_231212	0089_PW374_231212
				Sampling date / time	12-Dec-2023 09:22	12-Dec-2023 09:23	12-Dec-2023 09:23	12-Dec-2023 09:24	12-Dec-2023 09:25
Compound	CAS Number	LOR	Unit		EP2317629-001	EP2317629-002	EP2317629-003	EP2317629-004	EP2317629-005
					Result	Result	Result	Result	Result
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	<1	<1	<1	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	<1	<1	<1	<1
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		130	130	129	131	177
Total Alkalinity as CaCO3	---	1	mg/L		130	130	129	131	177
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		2770	2780	2780	2770	2720
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		20600	20600	20700	20500	20200
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		464	445	446	444	439
Magnesium	7439-95-4	1	mg/L		1470	1410	1430	1420	1400
Sodium	7440-23-5	1	mg/L		11800	11300	11500	11400	11200
Potassium	7440-09-7	1	mg/L		573	550	559	556	547
EN055: Ionic Balance									
ø Total Anions	---	0.01	meq/L		641	642	644	638	630
ø Total Cations	---	0.01	meq/L		672	644	654	649	638
ø Ionic Balance	---	0.01	%		2.34	0.18	0.78	0.82	0.65
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	0.02	<0.01
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_SW318_231212	0089_QC109_231212	0089_SW319_231212	0089_SW317_231212	0089_PW374_231212
				Sampling date / time	12-Dec-2023 09:22	12-Dec-2023 09:23	12-Dec-2023 09:23	12-Dec-2023 09:24	12-Dec-2023 09:25
Compound	CAS Number	LOR	Unit		EP2317629-001	EP2317629-002	EP2317629-003	EP2317629-004	EP2317629-005
					Result	Result	Result	Result	Result
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
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									

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_SW318_231212	0089_QC109_231212	0089_SW319_231212	0089_SW317_231212	0089_PW374_231212
				Sampling date / time	12-Dec-2023 09:22	12-Dec-2023 09:23	12-Dec-2023 09:23	12-Dec-2023 09:24	12-Dec-2023 09:25
Compound	CAS Number	LOR	Unit		EP2317629-001	EP2317629-002	EP2317629-003	EP2317629-004	EP2317629-005
					Result	Result	Result	Result	Result
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
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	**0.02**	<0.01
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		<0.01	<0.01	<0.01	**0.02**	<0.01
Sum of PFAS (WA DER List)	---	0.01	µg/L		<0.01	<0.01	<0.01	**0.02**	<0.01
EP231S: PFAS Surrogate									
13C4-PFOS	---	0.02	%		**106**	**96.9**	**100**	**95.7**	**92.0**
13C8-PFOA	---	0.02	%		**93.9**	**100**	**95.9**	**102**	**100**

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_PW378_231212	0089_PW375_231212	0089_QC110_231212	----	----
				Sampling date / time	12-Dec-2023 09:25	12-Dec-2023 09:26	12-Dec-2023 09:27	----	----
Compound	CAS Number	LOR	Unit		EP2317629-006	EP2317629-007	EP2317629-008	--------	--------
					Result	Result	Result	----	----
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	<1	<1	----	----
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	<1	<1	----	----
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		140	131	142	----	----
Total Alkalinity as CaCO3	----	1	mg/L		140	131	142	----	----
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		2850	3130	2910	----	----
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		21200	21200	21200	----	----
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		455	449	444	----	----
Magnesium	7439-95-4	1	mg/L		1450	1440	1420	----	----
Sodium	7440-23-5	1	mg/L		11700	11600	11400	----	----
Potassium	7440-09-7	1	mg/L		569	565	560	----	----
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		660	666	661	----	----
ø Total Cations	----	0.01	meq/L		666	660	649	----	----
ø Ionic Balance	----	0.01	%		0.40	0.44	0.93	----	----
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		0.02	<0.01	<0.01	----	----
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	<0.02	<0.02	----	----

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_PW378_231212	0089_PW375_231212	0089_QC110_231212	----	----
				Sampling date / time	12-Dec-2023 09:25	12-Dec-2023 09:26	12-Dec-2023 09:27	----	----
Compound	CAS Number	LOR	Unit		EP2317629-006	EP2317629-007	EP2317629-008	--------	--------
					Result	Result	Result	----	----
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	----	----
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									

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_PW378_231212	0089_PW375_231212	0089_QC110_231212	----	----
				Sampling date / time	12-Dec-2023 09:25	12-Dec-2023 09:26	12-Dec-2023 09:27	----	----
Compound	CAS Number	LOR	Unit		EP2317629-006	EP2317629-007	EP2317629-008	--------	--------
					Result	Result	Result	----	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
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		**0.02**	<0.01	<0.01	----	----
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		**0.02**	<0.01	<0.01	----	----
Sum of PFAS (WA DER List)	---	0.01	µg/L		**0.02**	<0.01	<0.01	----	----
EP231S: PFAS Surrogate									
13C4-PFOS	---	0.02	%		**92.9**	**105**	**100**	----	----
13C8-PFOA	---	0.02	%		**101**	**104**	**94.0**	----	----

Surrogate Control Limits

Sub-Matrix: SURFACE WATER		Recovery Limits (%)	
Compound	CAS Number	Low	High
EP231S: PFAS Surrogate			
13C4-PFOS	---	65	140
13C8-PFOA	---	71	133

QUALITY CONTROL REPORT

Work Order	: **EP2317629**	Page	: 1 of 10
Client	: **STANTEC AUSTRALIA PY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: Customer Services EP
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: +61-8-9406 1301
Project	: WA_0089_PFASOMP_23	Date Samples Received	: 13-Dec-2023
Order number	: pfas-omp/Stirling	Date Analysis Commenced	: 15-Dec-2023
C-O-C number	: 61459	Issue Date	: 27-Dec-2023
Sampler	: [redacted] [redacted]		
Site	: Stirling SW/PW - AH		
Quote number	: SY/139/19 B		
No. of samples received	: 8		
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]	Inorganics Supervisor	Perth Inorganics, Wangara, WA
[redacted]	Senior Organic Chemist	Perth Organics, Wangara, WA

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 (%)
ED037P: Alkalinity by PC Titrator (QC Lot: 5502420)									
EP2317627-002	Anonymous	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	464	463	0.3	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	464	463	0.3	0% - 20%
EP2317629-002	0089_QC109_231212	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	130	131	0.0	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	130	131	0.0	0% - 20%
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QC Lot: 5507743)									
EP2317629-001	0089_SW318_231212	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	2770	2810	1.3	0% - 20%
EP2317787-003	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	1660	1630	1.6	0% - 20%
ED045G: Chloride by Discrete Analyser (QC Lot: 5507744)									
EP2317629-001	0089_SW318_231212	ED045G: Chloride	16887-00-6	1	mg/L	20600	20700	0.3	0% - 20%
EP2317787-003	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	3420	3410	0.4	0% - 20%
ED093F: Dissolved Major Cations (QC Lot: 5500559)									
EP2317628-012	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	199	200	0.0	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	334	337	0.9	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	2350	2380	1.4	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	104	107	2.4	0% - 20%
EP2317629-007	0089_PW375_231212	ED093F Calcium	7440-70-2	1	mg/L	449	454	1.0	0% - 20%

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 (%)
ED093F: Dissolved Major Cations (QC Lot: 5500559) - continued									
EP2317629-007	0089_PW375_231212	ED093F: Magnesium	7439-95-4	1	mg/L	1440	1460	1.4	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	11600	11700	1.3	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	565	571	1.1	0% - 20%
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 5502775)									
EP2317628-008	Anonymous	EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	0.38	0.38	0.0	0% - 20%
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	0.12	0.10	11.4	0% - 50%
		EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	0.05	0.06	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	0.11	0.11	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: 5502975)									
EP2317628-007	Anonymous	EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01 (0.04)*	µg/L	22.4	19.0	16.3	0% - 20%
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01 (0.04)*	µg/L	56.8	48.0	16.8	0% - 20%
		EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	1.68	1.60	5.4	0% - 20%
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02 (0.04)*	µg/L	1.40	1.15	19.0	0% - 20%
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	3.69	3.46	6.3	0% - 20%
		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: 5502775)									
EP2317628-008	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	0.06	0.06	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: 5502975)									
EP2317628-007	Anonymous	EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	1.40	1.28	8.3	0% - 20%
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	0.99	0.88	12.1	0% - 20%
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	4.46	3.73	17.7	0% - 20%
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	0.44	0.41	6.1	0% - 20%
		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

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 (%)
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 5502975) - continued									
EP2317628-007	Anonymous	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	0.8	0.7	0.0	No Limit
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 5502775)									
EP2317628-008	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
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 5502975)									
EP2317628-007	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: 5502775)									
EP2317628-008	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

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: 5502775) - continued									
EP2317628-008	Anonymous	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: 5502975)									
EP2317628-007	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: 5502775)									
EP2317628-008	Anonymous	EP231X: Sum of PFAS	----	0.01	µg/L	0.73	0.72	1.4	0% - 20%
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	0.50	0.48	4.1	0% - 20%
		EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	0.62	0.61	1.6	0% - 20%
EP231P: PFAS Sums (QC Lot: 5502975)									
EP2317628-007	Anonymous	EP231X: Sum of PFAS	----	0.01 (0.04)*	µg/L	94.1	80.2	15.9	0% - 20%
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01 (0.04)*	µg/L	79.2	67.0	16.7	0% - 20%
		EP231X: Sum of PFAS (WA DER List)	----	0.01 (0.04)*	µg/L	89.0	75.6	16.2	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
ED037P: Alkalinity by PC Titrator (QCLot: 5502420)								
ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	---	---	---	---
ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	---	---	---	---
ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	<1	---	---	---	---
ED037-P: Total Alkalinity as CaCO3	---	1	mg/L	<1	20 mg/L	96.8	85.1	126
				<1	200 mg/L	97.1	90.5	111
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 5507743)								
ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<1	25 mg/L	98.9	89.9	112
				<1	500 mg/L	97.1	89.9	112
ED045G: Chloride by Discrete Analyser (QCLot: 5507744)								
ED045G: Chloride	16887-00-6	1	mg/L	<1	10 mg/L	98.0	88.6	113
				<1	1000 mg/L	97.5	88.6	113
ED093F: Dissolved Major Cations (QCLot: 5500559)								
ED093F: Calcium	7440-70-2	1	mg/L	<1	50 mg/L	100.0	86.5	117
ED093F: Magnesium	7439-95-4	1	mg/L	<1	50 mg/L	99.0	88.4	110
ED093F: Sodium	7440-23-5	1	mg/L	<1	50 mg/L	96.7	91.4	113
ED093F: Potassium	7440-09-7	1	mg/L	<1	50 mg/L	95.3	84.6	108
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5502775)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.2218 µg/L	97.8	72.0	130
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.2352 µg/L	111	71.0	127
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	0.2373 µg/L	97.1	68.0	131
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.238 µg/L	93.7	69.0	134
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.232 µg/L	88.4	65.0	140
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.241 µg/L	88.0	53.0	142
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5502975)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.2218 µg/L	96.2	72.0	130
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.2352 µg/L	101	71.0	127
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	0.2373 µg/L	94.2	68.0	131
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.238 µg/L	92.8	69.0	134
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.232 µg/L	90.1	65.0	140
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.241 µg/L	86.5	53.0	142

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: 5502775)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	1.25 µg/L	98.2	73.0	129
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	0.25 µg/L	91.2	72.0	129
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	0.25 µg/L	103	72.0	129
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	0.25 µg/L	101	72.0	130
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	0.25 µg/L	111	71.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	0.25 µg/L	117	69.0	130
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	0.25 µg/L	89.6	71.0	129
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	0.25 µg/L	95.8	69.0	133
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	0.25 µg/L	101	72.0	134
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	0.25 µg/L	94.6	65.0	144
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	0.25 µg/L	98.0	71.0	132
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5502975)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	1.25 µg/L	94.4	73.0	129
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	0.25 µg/L	98.6	72.0	129
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	0.25 µg/L	88.4	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
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	87.8	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	118	69.0	133
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	0.25 µg/L	88.8	72.0	134
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	0.25 µg/L	90.0	65.0	144
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	0.25 µg/L	104	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5502775)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.25 µg/L	70.4	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	0.625 µg/L	113	68.0	141
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	0.625 µg/L	106	60.5	138
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	0.625 µg/L	90.3	68.3	134
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	0.625 µg/L	110	62.2	138
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	0.25 µg/L	101	65.0	136
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	0.25 µg/L	79.6	61.0	135

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: 5502975)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.25 µg/L	95.6	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	0.625 µg/L	104	68.0	141
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	0.625 µg/L	78.3	60.5	138
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	0.625 µg/L	113	68.3	134
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	0.625 µg/L	92.8	62.2	138
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	0.25 µg/L	88.4	65.0	136
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	0.25 µg/L	108	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5502775)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.2343 µg/L	101	63.0	143
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	0.2378 µg/L	94.4	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	0.24 µg/L	105	67.0	138
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	0.241 µg/L	78.6	64.2	133
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5502975)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.2343 µg/L	96.2	63.0	143
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	0.2378 µg/L	91.2	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	0.24 µg/L	86.4	67.0	138
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	0.241 µg/L	83.4	64.2	133
EP231P: PFAS Sums (QCLot: 5502775)								
EP231X: Sum of PFAS	---	0.01	µg/L	<0.01	---	---	---	---
EP231X: Sum of PFHxS and PFOS	355-46-4/17 63-23-1	0.01	µg/L	<0.01	---	---	---	---
EP231X: Sum of PFAS (WA DER List)	---	0.01	µg/L	<0.01	---	---	---	---
EP231P: PFAS Sums (QCLot: 5502975)								
EP231X: Sum of PFAS	---	0.01	µg/L	<0.01	---	---	---	---
EP231X: Sum of PFHxS and PFOS	355-46-4/17 63-23-1	0.01	µg/L	<0.01	---	---	---	---
EP231X: Sum of PFAS (WA DER List)	---	0.01	µg/L	<0.01	---	---	---	---

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**

Matrix Spike (MS) Report

Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 5507743)							
EP2317629-001	0089_SW318_231212	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	100 mg/L	# Not Determined	70.4	130
ED045G: Chloride by Discrete Analyser (QCLot: 5507744)							
EP2317629-001	0089_SW318_231212	ED045G: Chloride	16887-00-6	200 mg/L	# Not Determined	70.0	130
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5502975)							
EP2317628-011	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.2218 µg/L	93.5	72.0	129
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.232 µg/L	114	71.0	127
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.2352 µg/L	86.5	68.0	129
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.238 µg/L	91.6	69.0	134
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.232 µg/L	95.1	65.0	140
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.241 µg/L	80.1	53.0	129
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5502975)							
EP2317628-011	Anonymous	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	1.25 µg/L	97.5	73.0	142
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.25 µg/L	93.8	72.0	129
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.25 µg/L	97.2	72.0	129
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.25 µg/L	86.6	72.0	130
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.25 µg/L	98.4	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	103	71.0	134
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.25 µg/L	118	69.0	133
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.25 µg/L	91.0	72.0	134
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.25 µg/L	90.6	65.0	144
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.25 µg/L	106	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5502975)							
EP2317628-011	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.25 µg/L	99.4	59.0	135
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.625 µg/L	88.0	70.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.625 µg/L	74.0	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.625 µg/L	98.1	70.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.625 µg/L	79.7	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.25 µg/L	86.8	65.0	136
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.25 µg/L	98.8	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5502975)							

Sub-Matrix: **WATER**

Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report: Spike Concentration	Matrix Spike (MS) Report: SpikeRecovery(%) MS	Matrix Spike (MS) Report: Acceptable Limits (%) Low	Matrix Spike (MS) Report: Acceptable Limits (%) High
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5502975) - continued							
EP2317628-011	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.234 µg/L	98.1	63.0	143
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.2378 µg/L	84.8	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.24 µg/L	83.1	67.0	138
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.2415 µg/L	88.2	70.0	130

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **EP2317629**	Page	: 1 of 6
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Telephone	: +61-8-9406 1301
Project	: WA_0089_PFASOMP_23	Date Samples Received	: 13-Dec-2023
Site	: Stirling SW/PW - AH	Issue Date	: 27-Dec-2023
Sampler	: [redacted]	No. of samples received	: 8
Order number	: pfas-omp/Stirling	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.**
- **Matrix Spike outliers exist - please see following pages for full details.**
- **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 : Quality Control Samples

Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

Matrix: **WATER**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
Matrix Spike (MS) Recoveries							
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA	EP2317629--001	0089_SW318_231212	**Sulfate as SO4 - Turbidimetric**	14808-79-8	Not Determined	---	**MS recovery not determined, background level greater than or equal to 4x spike level.**
ED045G: Chloride by Discrete Analyser	EP2317629--001	0089_SW318_231212	**Chloride**	16887-00-6	Not Determined	---	**MS recovery not determined, background level greater than or equal to 4x spike level.**

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	2	32	6.25	10.00	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)						
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	32	3.13	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*			*Analysis*		
			Date extracted	*Due for extraction*	*Evaluation*	*Date analysed*	*Due for analysis*	*Evaluation*
ED037P: Alkalinity by PC Titrator								
Clear Plastic Bottle - Natural (ED037-P)								
0089_SW318_231212,	0089_QC109_231212,	**12-Dec-2023**	---	---	---	**19-Dec-2023**	26-Dec-2023	✓
0089_SW319_231212,	0089_SW317_231212,							
0089_PW374_231212,	0089_PW378_231212,							
0089_PW375_231212,	0089_QC110_231212							
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA								
Clear Plastic Bottle - Natural (ED041G)								
0089_SW318_231212,	0089_QC109_231212,	**12-Dec-2023**	---	---	---	**23-Dec-2023**	09-Jan-2024	✓
0089_SW319_231212,	0089_SW317_231212,							
0089_PW374_231212,	0089_PW378_231212,							
0089_PW375_231212,	0089_QC110_231212							

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
ED045G: Chloride by Discrete Analyser							
Clear Plastic Bottle - Natural (ED045G)							
0089_SW318_231212, 0089_QC109_231212, 0089_SW319_231212, 0089_SW317_231212, 0089_PW374_231212, 0089_PW378_231212, 0089_PW375_231212, 0089_QC110_231212	**12-Dec-2023**	**----**	----	----	**23-Dec-2023**	09-Jan-2024	✓
ED093F: Dissolved Major Cations							
Clear Plastic Bottle - Natural (ED093F)							
0089_SW318_231212, 0089_QC109_231212, 0089_SW319_231212, 0089_SW317_231212, 0089_PW374_231212, 0089_PW378_231212, 0089_PW375_231212, 0089_QC110_231212	**12-Dec-2023**	**----**	----	----	**19-Dec-2023**	19-Dec-2023	✓
EP231A: Perfluoroalkyl Sulfonic Acids							
HDPE (no PTFE) (EP231X)							
0089_SW318_231212, 0089_SW319_231212, 0089_PW375_231212, 0089_QC110_231212	**12-Dec-2023**	**19-Dec-2023**	09-Jun-2024	✓	**19-Dec-2023**	09-Jun-2024	✓
HDPE (no PTFE) (EP231X)							
0089_QC109_231212, 0089_SW317_231212, 0089_PW374_231212, 0089_PW378_231212	**12-Dec-2023**	**19-Dec-2023**	09-Jun-2024	✓	**20-Dec-2023**	09-Jun-2024	✓
EP231B: Perfluoroalkyl Carboxylic Acids							
HDPE (no PTFE) (EP231X)							
0089_SW318_231212, 0089_SW319_231212, 0089_PW375_231212, 0089_QC110_231212	**12-Dec-2023**	**19-Dec-2023**	09-Jun-2024	✓	**19-Dec-2023**	09-Jun-2024	✓
HDPE (no PTFE) (EP231X)							
0089_QC109_231212, 0089_SW317_231212, 0089_PW374_231212, 0089_PW378_231212	**12-Dec-2023**	**19-Dec-2023**	09-Jun-2024	✓	**20-Dec-2023**	09-Jun-2024	✓
EP231C: Perfluoroalkyl Sulfonamides							
HDPE (no PTFE) (EP231X)							
0089_SW318_231212, 0089_SW319_231212, 0089_PW375_231212, 0089_QC110_231212	**12-Dec-2023**	**19-Dec-2023**	09-Jun-2024	✓	**19-Dec-2023**	09-Jun-2024	✓
HDPE (no PTFE) (EP231X)							
0089_QC109_231212, 0089_SW317_231212, 0089_PW374_231212, 0089_PW378_231212	**12-Dec-2023**	**19-Dec-2023**	09-Jun-2024	✓	**20-Dec-2023**	09-Jun-2024	✓
EP231D: (n:2) Fluorotelomer Sulfonic Acids							
HDPE (no PTFE) (EP231X)							
0089_SW318_231212, 0089_SW319_231212, 0089_PW375_231212, 0089_QC110_231212	**12-Dec-2023**	**19-Dec-2023**	09-Jun-2024	✓	**19-Dec-2023**	09-Jun-2024	✓
HDPE (no PTFE) (EP231X)							
0089_QC109_231212, 0089_SW317_231212, 0089_PW374_231212, 0089_PW378_231212	**12-Dec-2023**	**19-Dec-2023**	09-Jun-2024	✓	**20-Dec-2023**	09-Jun-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)							
0089_SW318_231212, 0089_SW319_231212, 0089_PW375_231212, 0089_QC110_231212	**12-Dec-2023**	**19-Dec-2023**	09-Jun-2024	✓	**19-Dec-2023**	09-Jun-2024	✓
HDPE (no PTFE) (EP231X)							
0089_QC109_231212, 0089_SW317_231212, 0089_PW374_231212, 0089_PW378_231212	**12-Dec-2023**	**19-Dec-2023**	09-Jun-2024	✓	**20-Dec-2023**	09-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)							
Alkalinity by Auto Titrator	ED037-P	2	17	**11.76**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	2	12	**16.67**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	32	**6.25**	**10.00**	×	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Alkalinity by Auto Titrator	ED037-P	2	17	**11.76**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	1	12	**8.33**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	32	**6.25**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Alkalinity by Auto Titrator	ED037-P	1	17	**5.88**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	1	12	**8.33**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	32	**6.25**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Chloride by Discrete Analyser	ED045G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	32	**3.13**	**5.00**	×	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	20	**5.00**	**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
Alkalinity by Auto Titrator	ED037-P	WATER	In house: Referenced to APHA 2320 B This procedure determines alkalinity by automated measurement (e.g. PC Titrate) on a settled supernatant aliquot of the sample using pH 4.5 for indicating the total alkalinity end-point. This method is compliant with NEPM Schedule B(3)
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	WATER	In house: Referenced to APHA 4500-SO4. Dissolved sulfate is determined in a 0.45um filtered sample. Sulfate ions are converted to a barium sulfate suspension in an acetic acid medium with barium chloride. Light absorbance of the BaSO4 suspension is measured by a photometer and the SO4-2 concentration is determined by comparison of the reading with a standard curve. This method is compliant with NEPM Schedule B(3)
Chloride by Discrete Analyser	ED045G	WATER	In house: Referenced to APHA 4500 Cl - G.The thiocyanate ion is liberated from mercuric thiocyanate through sequestration of mercury by the chloride ion to form non-ionised mercuric chloride. In the presence of ferric ions the liberated thiocynate forms highly-coloured ferric thiocynate which is measured at 480 nm.
Major Cations - Dissolved	ED093F	WATER	In house: Referenced to APHA 3120 and 3125; USEPA SW 846 - 6010 and 6020; Cations are determined by either ICP-AES or ICP-MS techniques. This method is compliant with NEPM Schedule B(3) Sodium Adsorption Ratio is calculated from Ca, Mg and Na which determined by ALS in house method QWI-EN/ED093F. This method is compliant with NEPM Schedule B(3) Hardness parameters are calculated based on APHA 2340 B. This method is compliant with NEPM Schedule B(3)
Ionic Balance by PCT DA and Turbi SO4 DA	* EN055 - PG	WATER	In house: Referenced to APHA 1030F. This method is compliant with NEPM Schedule B(3)
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.

Perth
Work Order Reference
EP2317630

Telephone : +61-8-9406 1301

Custody Document for Submissions via ALS Compass App

Project: WA_0089_PFASDMP_23 Client: Stantec Project Manager: [redacted]

Phone:

ALS Compass COC Reference: 61436, 61386, 61459, 61461 # Samples: 4 Eskies. Sampler: [redacted]

Phone:

Turnaround Requirements: Standard Urgent

Special Instructions:	ALS Use Only			
	Custody seal intact?	YES	NO	N/A
	Free ice / frozen ice bricks upon receipt?	YES	NO	N/A
	Random sample temperature on receipt?		°C	

Custody:

Relinquished by: [redacted]	Received by: [redacted]	Relinquished by:	Received by:
Date / Time: 12/12/23 ~ 4:00pm	Date / Time: 13/12 1215	Date / Time:	Date / Time:

CHAIN OF CUSTODY

COC#: 61461 *ALS Laboratory:* EP Perth Environmental

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

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP_23

SITE: Stirling SD - AH

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES 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 Sediments SEDIMENT	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
001	0089_SD374		12/12/2023 09:27 AM	SOIL	ALS: 1 Non ALS: 0	No	X		
002	0089_SDQC111		12/12/2023 09:28 AM	SOIL	ALS: 1 Non ALS: 0	No	X		
003	0089_SD378		12/12/2023 09:28 AM	SOIL	ALS: 1 Non ALS: 0	No	X		
004	0089_SD375		12/12/2023 09:28 AM	SOIL	ALS: 1 Non ALS: 0	No	X		

Tuesday, December 12, 2023 8:48:27 AM

CHAIN OF CUSTODY

ALS COC#: 61461 ALS Laboratory: EP Perth Environmental

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

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP_23

SITE: Stirling SD - AH

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES 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	0089_SD374	HDPE Soil Jar	200 mL	00621122011109	Grey	No	
002	0089_SDQC111	HDPE Soil Jar	200 mL	00621122011196	Grey	No	
003	0089_SD378	HDPE Soil Jar	200 mL	00621122011202	Grey	No	
004	0089_SD375	HDPE Soil Jar	200 mL	00621122011097	Grey	No	

Total Bottle Count: ALS: 4, Non ALS: 0

SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order	: **EP2317630**		
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: Customer Services EP
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
E-mail	: [redacted]stantec.com	E-mail	: ALSEnviro.Perth@alsglobal.com
Telephone	: ----	Telephone	: +61-8-9406 1301
Facsimile	: ----	Facsimile	: +61-8-9406 1399
Project	: WA_0089_PFASOMP_23	Page	: 1 of 2
Order number	: pfas-omp/Stirling	Quote number	: ES2022MWHAUS0002 (SY/139/19 B)
C-O-C number	: 61461	QC Level	: NEPM 2013 B3 & ALS QC Standard
Site	: Stirling SD - AH		
Sampler	: [redacted]		

Dates

Date Samples Received	: 13-Dec-2023 12:15	Issue Date	: 15-Dec-2023
Client Requested Due Date	: 27-Dec-2023	Scheduled Reporting Date	: **27-Dec-2023**

Delivery Details

Mode of Delivery	: Carrier	Security Seal	: Not Available
No. of coolers/boxes	: 1	Temperature	: 11.7 - Ice present
Receipt Detail	:	No. of samples received / analysed	: 4 / 4

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 see scanned COC for sample discrepencies: extra samples , samples not received etc.
- Please direct any queries related to sample condition / numbering / breakages to Sample Receipt (Samples.Perth@alsglobal.com)
- Analytical work for this work order will be conducted at ALS Environmental Perth.
- Please direct any turnaround / technical queries to the laboratory contact designated above.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months) from receipt of samples.
- **pH analysis should be conducted within 6 hours of sampling.**
- **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.**
- 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: **SOIL**

Laboratory sample ID	*Sampling date / time*	*Sample ID*	SOIL - EA055-103 Moisture Content	SOIL - EP231X (solids) PFAS - Full Suite (28 analytes)
EP2317630-001	12-Dec-2023 09:27	0089_SD374_231212	✓	✓
EP2317630-002	12-Dec-2023 09:28	0089_QC111_231212	✓	✓
EP2317630-003	12-Dec-2023 09:28	0089_SD378_231212	✓	✓
EP2317630-004	12-Dec-2023 09:28	0089_SD375_231212	✓	✓

Proactive Holding Time Report

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

Requested Deliverables

[redacted]
- A4 - AU Tax Invoice (INV) — Email — [redacted]cardno.com.au

DERP LAB REPORTS
- EDI Format - ESDAT (ESDAT) — Email — derp.labreports@esdat.com.au

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

CERTIFICATE OF ANALYSIS

Work Order	: **EP2317630**	Page	: 1 of 5
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: Customer Services EP
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: +61-8-9406 1301
Project	: WA_0089_PFASOMP_23	Date Samples Received	: 13-Dec-2023 12:15
Order number	: pfas-omp/Stirling	Date Analysis Commenced	: 18-Dec-2023
C-O-C number	: 61461	Issue Date	: 21-Dec-2023 15:54
Sampler	: [redacted]		
Site	: Stirling SD - AH		
Quote number	: SY/139/19 B		
No. of samples received	: 4		
No. of samples analysed	: 4		

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]	Inorganics Supervisor	Perth Inorganics, Wangara, WA
[redacted]	Senior Organic Chemist	Perth Organics, Wangara, WA

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.

- 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: SEDIMENT (Matrix: SOIL)				Sample ID	0089_SD374_231212	0089_QC111_231212	0089_SD378_231212	0089_SD375_231212	----
				Sampling date / time	12-Dec-2023 09:27	12-Dec-2023 09:28	12-Dec-2023 09:28	12-Dec-2023 09:28	----
Compound	CAS Number	LOR	Unit		EP2317630-001	EP2317630-002	EP2317630-003	EP2317630-004	--------
					Result	Result	Result	Result	---
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content	---	0.1	%		19.5	8.6	6.2	20.8	----
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	----
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	----
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	----
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	----
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	----
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	----
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg		<0.001	<0.001	<0.001	<0.001	----
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	----
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	----
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	----
Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	----
Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	----
Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	----
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	----
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	----
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	----
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	----
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	----

Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)				Sample ID	0089_SD374_231212	0089_QC111_231212	0089_SD378_231212	0089_SD375_231212	----
				Sampling date / time	12-Dec-2023 09:27	12-Dec-2023 09:28	12-Dec-2023 09:28	12-Dec-2023 09:28	----
Compound	CAS Number	LOR	Unit		EP2317630-001	EP2317630-002	EP2317630-003	EP2317630-004	--------
					Result	Result	Result	Result	---
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	----
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	----
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	----
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	----
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	----
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	----
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	----
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	----
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	----
EP231P: PFAS Sums									
Sum of PFAS	---	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	----
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	----
Sum of PFAS (WA DER List)	---	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	----
EP231S: PFAS Surrogate									
13C4-PFOS	---	0.0002	%		**98.0**	**99.0**	**116**	**97.5**	----
13C8-PFOA	---	0.0002	%		**106**	**104**	**100**	**100**	----

Surrogate Control Limits

Sub-Matrix: **SEDIMENT**		Recovery Limits (%)	
Compound	*CAS Number*	*Low*	*High*
EP231S: PFAS Surrogate			
13C4-PFOS	---	76	136
13C8-PFOA	---	78	131

QUALITY CONTROL REPORT

Work Order	: **EP2317630**	Page	: 1 of 7
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: Customer Services EP
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: +61-8-9406 1301
Project	: WA_0089_PFASOMP_23	Date Samples Received	: 13-Dec-2023
Order number	: pfas-omp/Stirling	Date Analysis Commenced	: 18-Dec-2023
C-O-C number	: 61461	Issue Date	: 21-Dec-2023
Sampler	: [redacted]		
Site	: Stirling SD - AH		
Quote number	: SY/139/19 B		
No. of samples received	: 4		
No. of samples analysed	: 4		

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]	Inorganics Supervisor	Perth Inorganics, Wangara, WA
[redacted]	Senior Organic Chemist	Perth Organics, Wangara, WA

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: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
EA055: Moisture Content (Dried @ 105-110°C) (QC Lot: 5499441)									
EP2317630-001	0089_SD374_231212	EA055: Moisture Content	----	0.1	%	19.5	19.7	1.1	0% - 20%
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 5496797)									
EP2317630-001	0089_SD374_231212	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
EP2317829-011	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 5496797)									
EP2317630-001	0089_SD374_231212	EP231X: Perfluoropentanoic acid (PFPeA)	2706 90 3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335 76 2	0 0002	mg/kg	0 0002	0 0002	0 0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit

Sub-Matrix: **SOIL**

				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: 5496797) - continued									
EP2317630-001	0089_SD374_231212	EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	<0.001	0.0	No Limit
EP2317829-011	Anonymous	EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	<0.001	0.0	No Limit
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 5496797)									
EP2317630-001	0089_SD374_231212	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355 31 9	0 0002	mg/kg	0 0002	0 0002	0 0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691 99 2	0 0005	mg/kg	0 0005	0 0005	0 0	No Limit
EP2317829-011	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506 32 8	0 0005	mg/kg	0 0005	0 0005	0 0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit

Sub-Matrix: **SOIL**

				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: 5496797) - continued									
EP2317829-011	Anonymous	EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 5496797)									
EP2317630-001	0089_SD374_231212	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
EP2317829-011	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
EP231P: PFAS Sums (QC Lot: 5496797)									
EP2317630-001	0089_SD374_231212	EP231X: Sum of PFAS	----	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Sum of PFAS (WA DER List)	----	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
EP2317829-011	Anonymous	EP231X: Sum of PFAS	----	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Sum of PFAS (WA DER List)	----	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit

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: **SOIL**

				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: 5496797)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	0.0011 mg/kg	97.7	72.0	128
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	0.00125 mg/kg	91.6	73.0	123
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	0.00118 mg/kg	94.5	67.0	130
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	0.00119 mg/kg	103	70.0	132
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	0.00116 mg/kg	93.5	68.0	136
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	0.0012 mg/kg	95.0	59.0	134
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5496797)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	0.00625 mg/kg	93.5	71.0	135
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	0.00125 mg/kg	102	69.0	132
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	0.00125 mg/kg	93.2	70.0	132
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	0.00125 mg/kg	98.0	71.0	131
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	96.0	69.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	91.2	72.0	129
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	0.00125 mg/kg	104	69.0	133
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	109	64.0	136
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	104	69.0	135
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	112	66.0	139
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	0.00125 mg/kg	116	69.0	133
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5496797)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	0.00125 mg/kg	111	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	0.00312 mg/kg	90.7	59.6	143
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	0.00312 mg/kg	89.7	62.8	140
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	0.00312 mg/kg	105	61.5	139
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	0.00312 mg/kg	99.4	61.9	139
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	0.00125 mg/kg	117	63.0	144
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	0.00125 mg/kg	102	61.0	139
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5496797)								

Sub-Matrix: **SOIL**

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: 5496797) - continued								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	0.00117 mg/kg	88.5	62.0	145
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	0.00118 mg/kg	109	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	0.0012 mg/kg	104	65.0	137
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	0.0012 mg/kg	92.9	54.8	124
EP231P: PFAS Sums (QCLot: 5496797)								
EP231X: Sum of PFAS	---	0.0002	mg/kg	<0.0002	---	---	---	---
EP231X: Sum of PFHxS and PFOS	355-46-4/17 63-23-1	0.0002	mg/kg	<0.0002	---	---	---	---
EP231X: Sum of PFAS (WA DER List)	---	0.0002	mg/kg	<0.0002	---	---	---	---

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: **SOIL**

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: 5496797)							
EP2317630-002	0089_QC111_231212	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0011 mg/kg	99.6	72.0	128
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.00117 mg/kg	105	73.0	123
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.00118 mg/kg	99.5	67.0	130
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.00119 mg/kg	104	70.0	132
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.00116 mg/kg	91.0	68.0	136
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0012 mg/kg	95.5	59.0	134
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5496797)							
EP2317630-002	0089_QC111_231212	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.00625 mg/kg	100.0	71.0	135
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.00125 mg/kg	97.2	69.0	132
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.00125 mg/kg	103	70.0	132
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.00125 mg/kg	108	71.0	131
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.00125 mg/kg	102	69.0	133
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.00125 mg/kg	99.9	72.0	129
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.00125 mg/kg	98.3	69.0	133
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.00125 mg/kg	93.5	64.0	136
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.00125 mg/kg	113	69.0	135
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.00125 mg/kg	100	66.0	139
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.00125 mg/kg	116	69.0	133
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5496797)							

Sub-Matrix: **SOIL**

				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: 5496797) - continued							
EP2317630-002	0089_QC111_231212	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.00125 mg/kg	99.2	48.0	128
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.00312 mg/kg	109	60.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.00312 mg/kg	101	60.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.00312 mg/kg	107	60.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.00312 mg/kg	99.7	60.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.00125 mg/kg	123	63.0	144
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.00125 mg/kg	101	61.0	139
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5496797)							
EP2317630-002	0089_QC111_231212	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.00117 mg/kg	91.9	62.0	145
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.00118 mg/kg	107	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0012 mg/kg	105	65.0	137
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0012 mg/kg	96.4	60.0	130

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **EP2317630**	Page	: 1 of 4
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Telephone	: +61-8-9406 1301
Project	: WA_0089_PFASOMP_23	Date Samples Received	: 13-Dec-2023
Site	: Stirling SD - AH	Issue Date	: 21-Dec-2023
Sampler	: [redacted]	No. of samples received	: 4
Order number	: pfas-omp/Stirling	No. of samples analysed	: 4

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: **SOIL**

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
EA055: Moisture Content (Dried @ 105-110°C)								
HDPE Soil Jar (EA055)								
0089_SD374_231212,	0089_QC111_231212,	**12-Dec-2023**	**----**	----	----	**20-Dec-2023**	26-Dec-2023	✓
0089_SD378_231212,	0089_SD375_231212							
EP231A: Perfluoroalkyl Sulfonic Acids								
HDPE Soil Jar (EP231X)								
0089_SD374_231212,	0089_QC111_231212,	**12-Dec-2023**	**18-Dec-2023**	09-Jun-2024	✓	**18-Dec-2023**	27-Jan-2024	✓
0089_SD378_231212,	0089_SD375_231212							
EP231B: Perfluoroalkyl Carboxylic Acids								
HDPE Soil Jar (EP231X)								
0089_SD374_231212,	0089_QC111_231212,	**12-Dec-2023**	**18-Dec-2023**	09-Jun-2024	✓	**18-Dec-2023**	27-Jan-2024	✓
0089_SD378_231212,	0089_SD375_231212							
EP231C: Perfluoroalkyl Sulfonamides								
HDPE Soil Jar (EP231X)								
0089_SD374_231212,	0089_QC111_231212,	**12-Dec-2023**	**18-Dec-2023**	09-Jun-2024	✓	**18-Dec-2023**	27-Jan-2024	✓
0089_SD378_231212,	0089_SD375_231212							
EP231D: (n:2) Fluorotelomer Sulfonic Acids								
HDPE Soil Jar (EP231X)								
0089_SD374_231212,	0089_QC111_231212,	**12-Dec-2023**	**18-Dec-2023**	09-Jun-2024	✓	**18-Dec-2023**	27-Jan-2024	✓
0089_SD378_231212,	0089_SD375_231212							
EP231P: PFAS Sums								
HDPE Soil Jar (EP231X)								
0089_SD374_231212,	0089_QC111_231212,	**12-Dec-2023**	**18-Dec-2023**	09-Jun-2024	✓	**18-Dec-2023**	27-Jan-2024	✓
0089_SD378_231212,	0089_SD375_231212							

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: **SOIL**

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)							
Moisture Content	EA055	1	10	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	17	**11.76**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	17	**5.88**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	17	**5.88**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	17	**5.88**	**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
Moisture Content	EA055	SOIL	In house: A gravimetric procedure based on weight loss over a 12 hour drying period at 105-110 degrees C. This method is compliant with NEPM Schedule B(3).
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	SOIL	In-house: Analysis of soils by solvent extraction followed by LC-Electrospray-MS-MS, Negative Mode using MRM using internal standard quantitation. Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to a portion of soil which is then extracted with MTBE and an ion pairing reagent. A portion of extract is exchanged into the analytical solvent mixture, combined with an equal volume reagent water and 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
QuECheRS Extraction of Solids	* ORG71	SOIL	In house: Sequential extractions with Acetonitrile/Methanol by shaking. Extraction efficiency aided by the addition of salts under acidic conditions. Where relevant, interferences from co-extracted organics are removed with dispersive clean-up media (dSPE). The extract is either diluted or concentrated and exchanged into the analytical solvent.

ALSCompass
SAMPLING *Intelligence*

Environmental Division
Perth
Work Order Reference
EP2317690

Telephone - 61-8-9406 1301

Custody Document for Submissions via ALS Compass App

Project: WA_0089_PFASOMP_23 **Client:** Stantec

Project Manager: [redacted]
Phone:

ALS Compass COC Reference: 61564; 61565; 61534; 61532; 61516; 61523; 61521; 61529; 61533 **# Samples:** 2 Eskies

Sampler: [redacted]
Phone:

Turnaround Requirements: Standard Urgent

Special Instructions:

Custody:

Relinquished by:	Received by:	Relinquished by:	Received by:
[redacted]	[redacted]		
Date / Time: 8/12/23	Date / Time: 13/12@1700.	Date / Time:	Date / Time:

CHAIN OF CUSTODY

(ALS) COC#: **61520** *ALS Laboratory:* EP Perth Environmental

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

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP_23

SITE: Stirling SW/PW - MB

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH [redacted] SAMPLER MOBILE [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS T [redacted]

EMAIL INVOICES T [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	WA OMP Water Suite WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
001	0089_PW367		13/12/2023 09:18 AM	WATER	ALS: 3 Non ALS: 0	No	X		
002	0089_QC115		13/12/2023 09:18 AM	WATER	ALS: 2 Non ALS: 0	No	Partial 1/2		
003	0089_SW370		13/12/2023 09:29 AM	WATER	ALS: 5 Non ALS: 0	No	X		Extra pfas bottles for lab qc
004	0089_PW345		13/12/2023 09:40 AM	WATER	ALS: 3 Non ALS: 0	No	X		
005	0089_PW369		13/12/2023 10:04 AM	WATER	ALS: 3 Non ALS: 0	No	X		

CHAIN OF CUSTODY

ALS COC#: 61520 ALS Laboratory: EP Perth Environmental

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

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP_23

SITE: Stirling SW/PW - MB

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES 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
002	0089_QC115	WA OMP Water Suite WATER	WATER	- EP231X PFAS - Full Suite (28 analytes)

CHAIN OF CUSTODY

ALS COC#: 61520 ALS Laboratory: EP Perth Environmental

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP_23

SITE: Stirling SW/PW - MB

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted]

SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO: [redacted]

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

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	0089_PW367	Clear Plastic Bottle - Natural	125 mL	00070522229833	Green	No	
001	0089_PW367	HDPE (no PTFE)	20 mL	00352309068196	Grey	No	
001	0089_PW367	HDPE (no PTFE)	20 mL	00352309068125	Grey	No	
002	0089_QC115	HDPE (no PTFE)	20 mL	00350822058760	Grey	No	
002	0089_QC115	HDPE (no PTFE)	20 mL	00350822058863	Grey	No	
003	0089_SW370	HDPE (no PTFE)	20 mL	00352309067908	Grey	No	
003	0089_SW370	HDPE (no PTFE)	20 mL	00351221006179	Grey	No	
003	0089_SW370	Clear Plastic Bottle - Natural	125 mL	00070522229642	Green	No	
003	0089_SW370	HDPE (no PTFE)	20 mL	00352309068213	Grey	No	
003	0089_SW370	HDPE (no PTFE)	20 mL	00351221005952	Grey	No	
004	0089_PW345	Clear Plastic Bottle - Natural	125 mL	00070522229703	Green	No	
004	0089_PW345	HDPE (no PTFE)	20 mL	00352309067960	Grey	No	
004	0089_PW345	HDPE (no PTFE)	20 mL	00352309068173	Grey	No	
005	0089_PW369	Clear Plastic Bottle - Natural	125 mL	00070522229787	Green	No	
005	0089_PW369	HDPE (no PTFE)	20 mL	00352309068199	Grey	No	
005	0089_PW369	HDPE (no PTFE)	20 mL	00352309068296	Grey	No	

Total Bottle Count: ALS: 16, Non ALS: 0

SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : **EP2317690**

Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: Customer Services EP
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
E-mail	: [redacted]stantec.com	E-mail	: ALSEnviro.Perth@alsglobal.com
Telephone	: ----	Telephone	: +61-8-9406 1301
Facsimile	: ----	Facsimile	: +61-8-9406 1399
Project	: WA_0089_PFASOMP_23	Page	: 1 of 2
Order number	: pfas-omp/Stirling	Quote number	: ES2022MWHAUS0002 (SY/139/19 B)
C-O-C number	: 61520	QC Level	: NEPM 2013 B3 & ALS QC Standard
Site	: Stirling SW/PW - MB		
Sampler	: [redacted]		

Dates

Date Samples Received	: 13-Dec-2023 17:00	Issue Date	: 16-Dec-2023
Client Requested Due Date	: 22-Dec-2023	Scheduled Reporting Date	: **22-Dec-2023**

Delivery Details

Mode of Delivery	: Carrier	Security Seal	: Not Available
No. of coolers/boxes	: 2	Temperature	: 6.7 - Ice present
Receipt Detail	:	No. of samples received / analysed	: 5 / 5

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 see scanned COC for sample discrepencies: extra samples , samples not received etc.
- Please direct any queries related to sample condition / numbering / breakages to Sample Receipt (Samples.Perth@alsglobal.com)
- Analytical work for this work order will be conducted at ALS Environmental Perth.
- Please direct any turnaround / technical queries to the laboratory contact designated above.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months) from receipt of samples.
- **pH analysis should be conducted within 6 hours of sampling.**
- **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.**
- 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)	WATER - NT-01 & 02 Ca, Mg, Na, K, Cl, SO4, Alkalinity
EP2317690-001	13-Dec-2023 09:18	0089_PW367_231213	✓	✓
EP2317690-002	13-Dec-2023 09:18	0089_QC115_231213	✓	
EP2317690-003	13-Dec-2023 09:29	0089_SW370_231213	✓	✓
EP2317690-004	13-Dec-2023 09:40	0089_PW345_231213	✓	✓
EP2317690-005	13-Dec-2023 10:04	0089_PW369_231213	✓	✓

Proactive Holding Time Report

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

Requested Deliverables

[redacted]
- A4 - AU Tax Invoice (INV) — Email — [redacted]cardno.com.au

DERP LAB REPORTS
- EDI Format - ESDAT (ESDAT) — Email — derp.labreports@esdat.com.au

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

CERTIFICATE OF ANALYSIS

Work Order	: **EP2317690**	Page	: 1 of 6
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: Customer Services EP
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: +61-8-9406 1301
Project	: WA_0089_PFASOMP_23	Date Samples Received	: 13-Dec-2023 17:00
Order number	: pfas-omp/Stirling	Date Analysis Commenced	: 19-Dec-2023
C-O-C number	: 61520	Issue Date	: 22-Dec-2023 14:43
Sampler	: [redacted]		
Site	: Stirling SW/PW - MB		
Quote number	: SY/139/19 B		
No. of samples received	: 5		
No. of samples analysed	: 5		

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]	Inorganics Supervisor	Perth Inorganics, Wangara, WA
[redacted]	Senior Organic Chemist	Perth Organics, Wangara, WA

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.
- As per QWI – EN55-3 Data Interpreting Procedures, Ionic balances are typically calculated using Major Anions - Chloride, Alkalinity and Sulfate; and Major Cations - Calcium, Magnesium, Potassium and Sodium. Where applicable and dependent upon sample matrix, the Ionic Balance may also include the additional contribution of Ammonia, Dissolved Metals by ICPMS and H+ to the Cations and Nitrate, SiO2 and Fluoride to the Anions.
- Sodium Adsorption Ratio (where reported): Where results for Na, Ca or Mg are <LOR, a concentration at half the reported LOR is incorporated into the SAR calculation. This represents a conservative approach for Na relative to the assumption that <LOR = zero concentration and a conservative approach for Ca & Mg relative to the assumption that <LOR is equivalent to the LOR concentration.
- 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.
- ED045G: The presence of Thiocyanate, Thiosulfate and Sulfite can positively contribute to the chloride result, thereby may bias results higher than expected. Results should be scrutinised accordingly.

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_PW367_231213	0089_QC115_231213	0089_SW370_231213	0089_PW345_231213	0089_PW369_231213
				Sampling date / time	13-Dec-2023 09:18	13-Dec-2023 09:18	13-Dec-2023 09:29	13-Dec-2023 09:40	13-Dec-2023 10:04
Compound	CAS Number	LOR	Unit		EP2317690-001	EP2317690-002	EP2317690-003	EP2317690-004	EP2317690-005
					Result	Result	Result	Result	Result
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	----	<1	<1	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	----	<1	<1	<1
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		861	----	122	524	384
Total Alkalinity as CaCO3	----	1	mg/L		861	----	122	524	384
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		2650	----	2940	3320	3300
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		22500	----	20700	24000	23800
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		578	----	468	682	522
Magnesium	7439-95-4	1	mg/L		1470	----	1370	1840	1680
Sodium	7440-23-5	1	mg/L		11900	----	11200	14600	13300
Potassium	7440-09-7	1	mg/L		460	----	423	734	654
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		707	----	648	757	748
ø Total Cations	----	0.01	meq/L		679	----	634	839	760
ø Ionic Balance	----	0.01	%		2.01	----	1.05	5.18	0.78
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	0.02	<0.01	0.03	0.02
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_PW367_231213	0089_QC115_231213	0089_SW370_231213	0089_PW345_231213	0089_PW369_231213
				Sampling date / time	13-Dec-2023 09:18	13-Dec-2023 09:18	13-Dec-2023 09:29	13-Dec-2023 09:40	13-Dec-2023 10:04
Compound	CAS Number	LOR	Unit		EP2317690-001	EP2317690-002	EP2317690-003	EP2317690-004	EP2317690-005
					Result	Result	Result	Result	Result
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
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									

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_PW367_231213	0089_QC115_231213	0089_SW370_231213	0089_PW345_231213	0089_PW369_231213
				Sampling date / time	13-Dec-2023 09:18	13-Dec-2023 09:18	13-Dec-2023 09:29	13-Dec-2023 09:40	13-Dec-2023 10:04
Compound	CAS Number	LOR	Unit		EP2317690-001	EP2317690-002	EP2317690-003	EP2317690-004	EP2317690-005
					Result	Result	Result	Result	Result
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
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**	**0.02**	<0.01	**0.03**	**0.02**
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		**0.02**	**0.02**	<0.01	**0.03**	**0.02**
Sum of PFAS (WA DER List)	---	0.01	µg/L		**0.02**	**0.02**	<0.01	**0.03**	**0.02**
EP231S: PFAS Surrogate									
13C4-PFOS	---	0.02	%		**101**	**95.3**	**93.2**	**97.3**	**98.3**
13C8-PFOA	---	0.02	%		**98.5**	**102**	**95.5**	**101**	**105**

Surrogate Control Limits

Sub-Matrix: SURFACE WATER		Recovery Limits (%)	
Compound	CAS Number	Low	High
EP231S: PFAS Surrogate			
13C4-PFOS	---	65	140
13C8-PFOA	---	71	133

QUALITY CONTROL REPORT

Work Order	: **EP2317690**	Page	: 1 of 13
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: Customer Services EP
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: +61-8-9406 1301
Project	: WA_0089_PFASOMP_23	Date Samples Received	: 13-Dec-2023
Order number	: pfas-omp/Stirling	Date Analysis Commenced	: 19-Dec-2023
C-O-C number	: 61520	Issue Date	: 22-Dec-2023
Sampler	: [redacted]		
Site	: Stirling SW/PW - MB		
Quote number	: SY/139/19 B		
No. of samples received	: 5		
No. of samples analysed	: 5		

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]	Inorganics Supervisor	Perth Inorganics, Wangara, WA
[redacted]	Senior Organic Chemist	Perth Organics, Wangara, WA

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 (%)*
ED037P: Alkalinity by PC Titrator (QC Lot: 5505346)									
EP2317690-003	0089_SW370_231213	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	122	138	12.3	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	122	138	12.3	0% - 20%
EP2317701-007	Anonymous	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	441	441	0.0	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	441	441	0.0	0% - 20%
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QC Lot: 5501016)									
EP2317690-001	0089_PW367_231213	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	2650	2690	1.7	0% - 20%
EP2317701-004	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	2730	2730	0.0	0% - 20%
ED045G: Chloride by Discrete Analyser (QC Lot: 5501017)									
EP2317690-001	0089_PW367_231213	ED045G: Chloride	16887-00-6	1	mg/L	22500	22400	0.5	0% - 20%
EP2317701-004	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	19500	19600	0.3	0% - 20%
ED093F: Dissolved Major Cations (QC Lot: 5500564)									
EP2317690-001	0089_PW367_231213	ED093F: Calcium	7440-70-2	1	mg/L	578	594	2.8	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	1470	1490	1.2	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	11900	12000	1.1	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	460	454	1.3	0% - 20%
EP2317700-009	Anonymous	ED093F Calcium	7440-70-2	1	mg/L	<1	<1	0.0	No Limit
		ED093F: Magnesium	7439-95-4	1	mg/L	<1	<1	0.0	No Limit
		ED093F: Sodium	7440-23-5	1	mg/L	<1	<1	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 (%)
ED093F: Dissolved Major Cations (QC Lot: 5500564) - continued									
EP2317700-009	Anonymous	ED093F: Potassium	7440-09-7	1	mg/L	<1	<1	0.0	No Limit
ED093F: Dissolved Major Cations (QC Lot: 5500583)									
EP2317690 004	0089 PW345 231213	ED093F: Calcium	7440 70 2	1	mg/L	682	635	7 2	0% 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	1840	1720	7.0	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	14600	13500	7.3	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	734	678	7.9	0% - 20%
EP2317850-002	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	481	460	4.4	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	1460	1450	0.6	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	11600	11400	1.2	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	570	565	0.9	0% - 20%
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 5503827)									
EP2317700-011	Anonymous	EP231X Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	0.05	0.04	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	0.12	0.11	11.1	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
EP2317849-002	Anonymous	EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	28.8	32.1	10.7	0% - 20%
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	62.8	69.7	10.4	0% - 20%
		EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	1.29	1.24	3.6	0% - 20%
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	5.68	6.29	10.2	0% - 20%
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	4.98	5.47	9.5	0% - 20%
		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: 5503834)									
EP2317690 003	0089 SW370 231213	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
EP2317729-002	Anonymous	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
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 5503827)									

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 (%)
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 5503827) - continued									
EP2317700-011	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
EP2317849-002	Anonymous	EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	4.14	4.17	0.9	0% - 20%
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	0.75	0.77	2.4	0% - 20%
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	6.23	6.27	0.6	0% - 20%
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	1.98	1.87	5.7	0% - 20%
		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	0.6	0.6	0.0	No Limit
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 5503834)									
EP2317690-003	0089_SW370_231213	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
EP2317729-002	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

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 (%)
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 5503834) - continued									
EP2317729-002	Anonymous	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: 5503827)									
EP2317700-011	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
EP2317849-002	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
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 5503834)									
EP2317690-003	0089_SW370_231213	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: 5503834) - continued									
EP2317690-003	0089_SW370_231213	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
EP2317729-002	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: 5503827)									
EP2317700-011	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
EP2317849-002	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
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 5503834)									
EP2317690-003	0089_SW370_231213	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 sample ID	Sample ID	Method: Compound	CAS Number	Laboratory Duplicate (DUP) Report					
				LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 5503834) - continued									
EP2317690-003	0089_SW370_231213	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
EP2317729-002	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: 5503827)									
EP2317700-011	Anonymous	EP231X: Sum of PFAS	----	0.01	µg/L	0.17	0.15	12.5	0% - 50%
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	0.17	0.15	12.5	0% - 50%
		EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	0.17	0.15	12.5	0% - 50%
EP2317849-002	Anonymous	EP231X: Sum of PFAS	----	0.01	µg/L	117	128	9.1	0% - 20%
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	91.6	102	10.5	0% - 20%
		EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	106	117	9.1	0% - 20%
EP231P: PFAS Sums (QC Lot: 5503834)									
EP2317690-003	0089_SW370_231213	EP231X: Sum of PFAS	----	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	<0.01	<0.01	0.0	No Limit
EP2317729-002	Anonymous	EP231X: Sum of PFAS	----	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	<0.01	<0.01	0.0	No Limit

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
ED037P: Alkalinity by PC Titrator (QCLot: 5505346)								
ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	---	---	---	---
ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	---	---	---	---
ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	<1	---	---	---	---
ED037-P: Total Alkalinity as CaCO3	---	1	mg/L	<1	20 mg/L	112	85.1	126
				<1	200 mg/L	102	90.5	111
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 5501016)								
ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<1	25 mg/L	97.3	89.9	112
				<1	500 mg/L	103	89.9	112
ED045G: Chloride by Discrete Analyser (QCLot: 5501017)								
ED045G: Chloride	16887-00-6	1	mg/L	<1	10 mg/L	97.3	88.6	113
				<1	1000 mg/L	98.6	88.6	113
ED093F: Dissolved Major Cations (QCLot: 5500564)								
ED093F: Calcium	7440-70-2	1	mg/L	<1	50 mg/L	105	86.5	117
ED093F: Magnesium	7439-95-4	1	mg/L	<1	50 mg/L	101	88.4	110
ED093F: Sodium	7440-23-5	1	mg/L	<1	50 mg/L	100	91.4	113
ED093F: Potassium	7440-09-7	1	mg/L	<1	50 mg/L	103	84.6	108
ED093F: Dissolved Major Cations (QCLot: 5500583)								
ED093F: Calcium	7440-70-2	1	mg/L	<1	50 mg/L	102	86.5	117
ED093F: Magnesium	7439-95-4	1	mg/L	<1	50 mg/L	102	88.4	110
ED093F: Sodium	7440-23-5	1	mg/L	<1	50 mg/L	106	91.4	113
ED093F: Potassium	7440-09-7	1	mg/L	<1	50 mg/L	99.5	84.6	108
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5503827)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.2218 µg/L	98.7	72.0	130
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.2352 µg/L	117	71.0	127
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	0.2373 µg/L	98.0	68.0	131
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.238 µg/L	105	69.0	134
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.232 µg/L	92.2	65.0	140
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.241 µg/L	89.4	53.0	142
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5503834)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.2218 µg/L	92.9	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
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5503834) - continued								
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.2352 µg/L	106	71.0	127
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	0.2373 µg/L	87.0	68.0	131
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.238 µg/L	101	69.0	134
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.232 µg/L	93.8	65.0	140
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.241 µg/L	92.5	53.0	142
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5503827)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	1.25 µg/L	105	73.0	129
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	0.25 µg/L	88.6	72.0	129
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	0.25 µg/L	112	72.0	129
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	0.25 µg/L	103	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	109	69.0	130
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	0.25 µg/L	87.0	71.0	129
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	0.25 µg/L	97.0	69.0	133
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	0.25 µg/L	93.0	72.0	134
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	0.25 µg/L	88.2	65.0	144
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	0.25 µg/L	102	71.0	132
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5503834)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	1.25 µg/L	87.8	73.0	129
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	0.25 µg/L	93.6	72.0	129
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	0.25 µg/L	87.4	72.0	129
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	0.25 µg/L	92.8	72.0	130
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	0.25 µg/L	93.2	71.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	0.25 µg/L	101	69.0	130
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	0.25 µg/L	87.4	71.0	129
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	0.25 µg/L	95.2	69.0	133
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	0.25 µg/L	86.6	72.0	134
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	0.25 µg/L	77.4	65.0	144
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	0.25 µg/L	82.4	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5503827)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.25 µg/L	74.8	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	0.625 µg/L	108	68.0	141
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	0.625 µg/L	90.2	60.5	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
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5503827) - continued								
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	0.625 µg/L	103	68.3	134
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	0.625 µg/L	96.1	62.2	138
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	0.25 µg/L	91.2	65.0	136
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	0.25 µg/L	122	61.0	135
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5503834)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.25 µg/L	89.8	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	0.625 µg/L	122	68.0	141
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	0.625 µg/L	81.2	60.5	138
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	0.625 µg/L	90.8	68.3	134
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	0.625 µg/L	113	62.2	138
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	0.25 µg/L	101	65.0	136
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	0.25 µg/L	88.6	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5503827)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.2343 µg/L	116	63.0	143
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	0.2378 µg/L	107	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	0.24 µg/L	115	67.0	138
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	0.241 µg/L	96.3	64.2	133
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5503834)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.2343 µg/L	106	63.0	143
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	0.2378 µg/L	97.4	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	0.24 µg/L	97.1	67.0	138
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	0.241 µg/L	92.3	64.2	133
EP231P: PFAS Sums (QCLot: 5503827)								
EP231X: Sum of PFAS	---	0.01	µg/L	<0.01	---	---	---	---
EP231X: Sum of PFHxS and PFOS	355-46-4/17 63-23-1	0.01	µg/L	<0.01	---	---	---	---
EP231X: Sum of PFAS (WA DER List)	---	0.01	µg/L	<0.01	---	---	---	---
EP231P: PFAS Sums (QCLot: 5503834)								
EP231X: Sum of PFAS	---	0.01	µg/L	<0.01	---	---	---	---

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	LCS: Spike Recovery (%)	Acceptable Limits (%): Low	Acceptable Limits (%): High
EP231P: PFAS Sums (QCLot: 5503834) - continued								
EP231X: Sum of PFHxS and PFOS	355-46-4/17 63-23-1	0.01	µg/L	<0.01	---	---	---	---
EP231X: Sum of PFAS (WA DER List)	---	0.01	µg/L	<0.01	---	---	---	---

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
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 5501016)							
EP2317690-001	0089_PW367_231213	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	100 mg/L	# Not Determined	70.4	130
ED045G: Chloride by Discrete Analyser (QCLot: 5501017)							
EP2317690-001	0089_PW367_231213	ED045G: Chloride	16887-00-6	200 mg/L	# Not Determined	70.0	130
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5503827)							
EP2317849-001	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.2218 µg/L	97.3	72.0	129
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.232 µg/L	122	71.0	127
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.2352 µg/L	109	68.0	129
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.238 µg/L	110	69.0	134
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.232 µg/L	92.1	65.0	140
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.241 µg/L	91.3	53.0	129
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5503834)							
EP2317700-008	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.2218 µg/L	102	72.0	129
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.232 µg/L	126	71.0	127
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.2352 µg/L	85.3	68.0	129
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.238 µg/L	103	69.0	134
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.232 µg/L	98.8	65.0	140
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.241 µg/L	90.0	53.0	129
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5503827)							
EP2317849-001	Anonymous	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	1.25 µg/L	102	73.0	142
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.25 µg/L	104	72.0	129
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.25 µg/L	111	72.0	129
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.25 µg/L	108	72.0	130
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.25 µg/L	114	71.0	133
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.25 µg/L	105	69.0	130

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: 5503827) - continued							
EP2317849-001	Anonymous	EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.25 µg/L	92.0	71.0	134
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.25 µg/L	103	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	118	65.0	144
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.25 µg/L	115	71.0	132
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5503834)							
EP2317700-008	Anonymous	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	1.25 µg/L	85.4	73.0	142
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.25 µg/L	89.4	72.0	129
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.25 µg/L	85.7	72.0	129
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.25 µg/L	88.8	72.0	130
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.25 µg/L	84.4	71.0	133
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.25 µg/L	98.4	69.0	130
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.25 µg/L	81.1	71.0	134
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.25 µg/L	91.4	69.0	133
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.25 µg/L	93.0	72.0	134
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.25 µg/L	77.6	65.0	144
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.25 µg/L	91.2	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5503827)							
EP2317849-001	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.25 µg/L	75.2	59.0	135
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.625 µg/L	124	70.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.625 µg/L	93.4	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.625 µg/L	89.8	70.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.625 µg/L	105	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.25 µg/L	87.4	65.0	136
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.25 µg/L	114	61.0	135
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5503834)							
EP2317700-008	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.25 µg/L	92.4	59.0	135
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.625 µg/L	121	70.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.625 µg/L	77.6	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.625 µg/L	87.7	70.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.625 µg/L	92.4	70.0	130

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: 5503834) - continued							
EP2317700-008	Anonymous	EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.25 µg/L	99.4	65.0	136
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.25 µg/L	91.8	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5503827)							
EP2317849-001	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.234 µg/L	114	63.0	143
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.2378 µg/L	111	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.24 µg/L	106	67.0	138
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.2415 µg/L	90.2	70.0	130
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5503834)							
EP2317700-008	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.234 µg/L	104	63.0	143
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.2378 µg/L	97.2	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.24 µg/L	101	67.0	138
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.2415 µg/L	86.3	70.0	130

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **EP2317690**	Page	: 1 of 5
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Telephone	: +61-8-9406 1301
Project	: WA_0089_PFASOMP_23	Date Samples Received	: 13-Dec-2023
Site	: Stirling SW/PW - MB	Issue Date	: 22-Dec-2023
Sampler	: [redacted]	No. of samples received	: 5
Order number	: pfas-omp/Stirling	No. of samples analysed	: 5

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.**
- **Matrix Spike outliers exist - please see following pages for full details.**
- **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.**

Outliers : Quality Control Samples

Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

Matrix: **WATER**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
Matrix Spike (MS) Recoveries							
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA	EP2317690--001	0089_PW367_231213	**Sulfate as SO4 - Turbidimetric**	14808-79-8	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
ED045G: Chloride by Discrete Analyser	EP2317690--001	0089_PW367_231213	**Chloride**	16887-00-6	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**

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*
ED037P: Alkalinity by PC Titrator							
Clear Plastic Bottle - Natural (ED037-P)							
0089_PW367_231213, 0089_SW370_231213, 0089_PW345_231213, 0089_PW369_231213	**13-Dec-2023**	**----**	----	----	**20-Dec-2023**	27-Dec-2023	✓
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA							
Clear Plastic Bottle - Natural (ED041G)							
0089_PW367_231213, 0089_SW370_231213, 0089_PW345_231213, 0089_PW369_231213	**13-Dec-2023**	**----**			**22-Dec-2023**	10 Jan 2024	✓
ED045G: Chloride by Discrete Analyser							
Clear Plastic Bottle - Natural (ED045G)							
0089 PW367 231213, 0089 SW370 231213, 0089 PW345 231213, 0089 PW369 231213	**13-Dec-2023**	**----**	----	----	**22-Dec-2023**	10-Jan-2024	✓
ED093F: Dissolved Major Cations							
Clear Plastic Bottle - Natural (ED093F)							
0089_PW367_231213, 0089_SW370_231213	**13-Dec-2023**	**----**	----	----	**19-Dec-2023**	20-Dec-2023	✓
Clear Plastic Bottle - Natural (ED093F)							
0089_PW345_231213, 0089_PW369_231213	**13-Dec-2023**	**----**	----	----	**20-Dec-2023**	20-Dec-2023	✓

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)								
0089_PW367_231213,	0089_QC115_231213,	**13-Dec-2023**	**19-Dec-2023**	10-Jun-2024	✓	**19-Dec-2023**	10-Jun-2024	✓
0089_SW370_231213,	0089_PW345_231213,							
0089_PW369_231213								
EP231B: Perfluoroalkyl Carboxylic Acids								
HDPE (no PTFE) (EP231X)								
0089_PW367_231213,	0089_QC115_231213,	**13-Dec-2023**	**19-Dec-2023**	10-Jun-2024	✓	**19-Dec-2023**	10-Jun-2024	✓
0089_SW370_231213,	0089_PW345_231213,							
0089_PW369_231213								
EP231C: Perfluoroalkyl Sulfonamides								
HDPE (no PTFE) (EP231X)								
0089_PW367_231213,	0089_QC115_231213,	**13-Dec-2023**	**19-Dec-2023**	10-Jun-2024	✓	**19-Dec-2023**	10-Jun-2024	✓
0089_SW370_231213,	0089_PW345_231213,							
0089_PW369_231213								
EP231D: (n:2) Fluorotelomer Sulfonic Acids								
HDPE (no PTFE) (EP231X)								
0089_PW367_231213,	0089_QC115_231213,	**13-Dec-2023**	**19-Dec-2023**	10-Jun-2024	✓	**19-Dec-2023**	10-Jun-2024	✓
0089_SW370_231213,	0089_PW345_231213,							
0089_PW369_231213								
EP231P: PFAS Sums								
HDPE (no PTFE) (EP231X)								
0089_PW367_231213,	0089_QC115_231213,	**13-Dec-2023**	**19-Dec-2023**	10-Jun-2024	✓	**19-Dec-2023**	10-Jun-2024	✓
0089_SW370_231213,	0089_PW345_231213,							
0089_PW369_231213								

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)							
Alkalinity by Auto Titrator	ED037-P	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	17	**11.76**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	4	40	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	4	40	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	17	**11.76**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Alkalinity by Auto Titrator	ED037-P	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	17	**11.76**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	2	40	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	40	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	17	**11.76**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Alkalinity by Auto Titrator	ED037-P	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	1	17	**5.88**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	2	40	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	40	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	17	**5.88**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Chloride by Discrete Analyser	ED045G	1	17	**5.88**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	40	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	17	**5.88**	**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
Alkalinity by Auto Titrator	ED037-P	WATER	In house: Referenced to APHA 2320 B This procedure determines alkalinity by automated measurement (e.g. PC Titrate) on a settled supernatant aliquot of the sample using pH 4.5 for indicating the total alkalinity end-point. This method is compliant with NEPM Schedule B(3)
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	WATER	In house: Referenced to APHA 4500-SO4. Dissolved sulfate is determined in a 0.45um filtered sample. Sulfate ions are converted to a barium sulfate suspension in an acetic acid medium with barium chloride. Light absorbance of the BaSO4 suspension is measured by a photometer and the SO4-2 concentration is determined by comparison of the reading with a standard curve. This method is compliant with NEPM Schedule B(3)
Chloride by Discrete Analyser	ED045G	WATER	In house: Referenced to APHA 4500 Cl - G.The thiocyanate ion is liberated from mercuric thiocyanate through sequestration of mercury by the chloride ion to form non-ionised mercuric chloride. In the presence of ferric ions the liberated thiocynate forms highly-coloured ferric thiocynate which is measured at 480 nm.
Major Cations - Dissolved	ED093F	WATER	In house: Referenced to APHA 3120 and 3125; USEPA SW 846 - 6010 and 6020; Cations are determined by either ICP-AES or ICP-MS techniques. This method is compliant with NEPM Schedule B(3) Sodium Adsorption Ratio is calculated from Ca, Mg and Na which determined by ALS in house method QWI-EN/ED093F. This method is compliant with NEPM Schedule B(3) Hardness parameters are calculated based on APHA 2340 B. This method is compliant with NEPM Schedule B(3)
Ionic Balance by PCT DA and Turbi SO4 DA	* EN055 - PG	WATER	In house: Referenced to APHA 1030F. This method is compliant with NEPM Schedule B(3)
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.

ALSCompass
SAMPLING *Intelligence*

ALS

Environmental Division
Perth
Work Order Reference
EP2317691

Telephone +61-8-9406 1301

Custody Document for Submissions via ALS Compass App

Project: WA_0054_PFASOMP_23 **Client:** Stantec **Project Manager:** [redacted]

Phone:

ALS Compass COC Reference: 61564; 61565; 61534; 61532; 61516; 61523; 61521; 61520; 61533 **# Samples:** 2 Eskies **Sampler:**

Phone:

Turnaround Requirements: Standard ____ Urgent ____

Special Instructions:

Custody:

Relinquished by:	Received by:	Relinquished by:	Received by:
[redacted]	[redacted]		
Date / Time: 8/12/23	Date / Time: 13/12@1700.	Date / Time:	Date / Time:

CHAIN OF CUSTODY

COC#: 61521 ALS Laboratory: EP Perth Environmental

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

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP_23

SITE: Stirling SD - MB

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO [redacted]

EMAIL INVOICES 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 Sediments SEDIMENT	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
001	0089_SD367		13/12/2023 09:11 AM	SOIL	ALS: 1 Non ALS: 0	No	X		
002	0089_QC116		13/12/2023 09:12 AM	SOIL	ALS: 1 Non ALS: 0	No	X		
003	0089_SD345		13/12/2023 09:41 AM	SOIL	ALS: 1 Non ALS: 0	No	X		
004	0089_SD369		13/12/2023 10:03 AM	SOIL	ALS: 1 Non ALS: 0	No	X		

CHAIN OF CUSTODY

COC#: **61521** *ALS Laboratory:* EP Perth Environmental

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

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP_23

SITE: Stirling SD - MB

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER [redacted]

PRIMARY SAMPLER [redacted]

CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES 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	0089_SD367	HDPE Soil Jar	200 mL	00521122011172	Grey	No	
002	0089_QC116	HDPE Soil Jar	200 mL	00521122011198	Grey	No	
003	0089_SD345	HDPE Soil Jar	200 mL	00521122011120	Grey	No	
004	0089_SD369	HDPE Soil Jar	200 mL	00521122011203	Grey	No	

Total Bottle Count: ALS: 4, Non ALS: 0

SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : **EP2317691**

Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: Customer Services EP
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
E-mail	: [redacted]stantec.com	E-mail	: ALSEnviro.Perth@alsglobal.com
Telephone	: ----	Telephone	: +61-8-9406 1301
Facsimile	: ----	Facsimile	: +61-8-9406 1399
Project	: WA_0089_PFASOMP_23	Page	: 1 of 2
Order number	: pfas-omp/Stirling	Quote number	: ES2022MWHAUS0002 (SY/139/19 B)
C-O-C number	: 61521	QC Level	: NEPM 2013 B3 & ALS QC Standard
Site	: Stirling SD - MB		
Sampler	: [redacted]		

Dates

Date Samples Received	: 13-Dec-2023 17:00	Issue Date	: 16-Dec-2023
Client Requested Due Date	: 22-Dec-2023	Scheduled Reporting Date	: **22-Dec-2023**

Delivery Details

Mode of Delivery	: Carrier	Security Seal	: Not Available
No. of coolers/boxes	: 2	Temperature	: 6.7 - Ice present
Receipt Detail	:	No. of samples received / analysed	: 4 / 4

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 see scanned COC for sample discrepencies: extra samples , samples not received etc.
- Please direct any queries related to sample condition / numbering / breakages to Sample Receipt (Samples.Perth@alsglobal.com)
- Analytical work for this work order will be conducted at ALS Environmental Perth.
- Please direct any turnaround / technical queries to the laboratory contact designated above.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months) from receipt of samples.
- **pH analysis should be conducted within 6 hours of sampling.**
- **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.**
- 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: **SOIL**

Laboratory sample ID	*Sampling date / time*	*Sample ID*	SOIL - EA055-103 Moisture Content	SOIL - EP231X (solids) PFAS - Full Suite (28 analytes)
EP2317691-001	13-Dec-2023 09:11	0089_SD367_231213	✓	✓
EP2317691-002	13-Dec-2023 09:12	0089_QC116_231213	✓	✓
EP2317691-003	13-Dec-2023 09:41	0089_SD345_231213	✓	✓
EP2317691-004	13-Dec-2023 10:03	0089_SD369_231213	✓	✓

Proactive Holding Time Report

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

Requested Deliverables

[redacted]
- A4 - AU Tax Invoice (INV) — Email — [redacted]cardno.com.au

DERP LAB REPORTS
- EDI Format - ESDAT (ESDAT) — Email — derp.labreports@esdat.com.au

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

CERTIFICATE OF ANALYSIS

Work Order	: **EP2317691**	Page	: 1 of 5
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: Customer Services EP
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: +61-8-9406 1301
Project	: WA_0089_PFASOMP_23	Date Samples Received	: 13-Dec-2023 17:00
Order number	: pfas-omp/Stirling	Date Analysis Commenced	: 18-Dec-2023
C-O-C number	: 61521	Issue Date	: 21-Dec-2023 15:51
Sampler	: [redacted]		
Site	: Stirling SD - MB		
Quote number	: SY/139/19 B		
No. of samples received	: 4		
No. of samples analysed	: 4		

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]	Laboratory Manager (Perth)	Perth Inorganics, Wangara, WA
[redacted]	Senior Organic Chemist	Perth Organics, Wangara, WA

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.

- 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: SEDIMENT (Matrix: SOIL)				Sample ID	0089_SD367_231213	0089_QC116_231213	0089_SD345_231213	0089_SD369_231213	----
				Sampling date / time	13-Dec-2023 09:11	13-Dec-2023 09:12	13-Dec-2023 09:41	13-Dec-2023 10:03	----
Compound	CAS Number	LOR	Unit		EP2317691-001	EP2317691-002	EP2317691-003	EP2317691-004	--------
					Result	Result	Result	Result	---
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content	---	0.1	%		**28.5**	**31.2**	**31.9**	**28.7**	----
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	----
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	----
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	----
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	----
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg		**0.0003**	**0.0003**	**0.0002**	<0.0002	----
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	----
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg		<0.001	<0.001	<0.001	<0.001	----
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	----
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	----
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	----
Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	----
Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	----
Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	----
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	----
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	----
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	----
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	----
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	----

Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)				Sample ID	0089_SD367_231213	0089_QC116_231213	0089_SD345_231213	0089_SD369_231213	----
				Sampling date / time	13-Dec-2023 09:11	13-Dec-2023 09:12	13-Dec-2023 09:41	13-Dec-2023 10:03	----
Compound	CAS Number	LOR	Unit		EP2317691-001	EP2317691-002	EP2317691-003	EP2317691-004	--------
					Result	Result	Result	Result	---
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	----
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	----
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	----
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	----
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	----
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	----
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	----
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	----
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	----
EP231P: PFAS Sums									
Sum of PFAS	---	0.0002	mg/kg		**0.0003**	**0.0003**	**0.0002**	<0.0002	----
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg		**0.0003**	**0.0003**	**0.0002**	<0.0002	----
Sum of PFAS (WA DER List)	---	0.0002	mg/kg		**0.0003**	**0.0003**	**0.0002**	<0.0002	----
EP231S: PFAS Surrogate									
13C4-PFOS	---	0.0002	%		**87.5**	**100**	**89.0**	**96.5**	----
13C8-PFOA	---	0.0002	%		**102**	**108**	**106**	**104**	----

Surrogate Control Limits

Sub-Matrix: **SEDIMENT**		Recovery Limits (%)	
Compound	*CAS Number*	*Low*	*High*
EP231S: PFAS Surrogate			
13C4-PFOS	---	76	136
13C8-PFOA	---	78	131

QUALITY CONTROL REPORT

Work Order	: **EP2317691**	Page	: 1 of 7
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: Customer Services EP
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: +61-8-9406 1301
Project	: WA_0089_PFASOMP_23	Date Samples Received	: 13-Dec-2023
Order number	: pfas-omp/Stirling	Date Analysis Commenced	: 18-Dec-2023
C-O-C number	: 61521	Issue Date	: 21-Dec-2023
Sampler	: [redacted]		
Site	: Stirling SD - MB		
Quote number	: SY/139/19 B		
No. of samples received	: 4		
No. of samples analysed	: 4		

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]	Laboratory Manager (Perth)	Perth Inorganics, Wangara, WA
[redacted]	Senior Organic Chemist	Perth Organics, Wangara, WA

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: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
EA055: Moisture Content (Dried @ 105-110°C) (QC Lot: 5499343)									
EP2317691-001	0089_SD367_231213	EA055: Moisture Content	----	0.1	%	28.5	27.9	2.2	0% - 20%
EP2317763-001	Anonymous	EA055: Moisture Content	----	0.1 (1.0)*	%	2.5	2.6	4.6	No Limit
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 5500708)									
EP2317564-045	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
EP2317691-002	0089_QC116_231213	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	0.0003	0.0003	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 5500708)									
EP2317564-045	Anonymous	EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit

Sub-Matrix: **SOIL**

				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: 5500708) - continued									
EP2317564-045	Anonymous	EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	<0.001	0.0	No Limit
EP2317691-002	0089_QC116_231213	EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	<0.001	0.0	No Limit
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 5500708)									
EP2317564-045	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448 09 7	0 0005	mg/kg	0 0005	0 0005	0 0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
EP2317691-002	0089_QC116_231213	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991 50 6	0 0002	mg/kg	0 0002	0 0002	0 0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit

Sub-Matrix: **SOIL**

				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: 5500708) - continued									
EP2317691-002	0089_QC116_231213	EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 5500708)									
EP2317564-045	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
EP2317691-002	0089_QC116_231213	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
EP231P: PFAS Sums (QC Lot: 5500708)									
EP2317564-045	Anonymous	EP231X: Sum of PFAS	----	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Sum of PFAS (WA DER List)	----	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
EP2317691-002	0089_QC116_231213	EP231X: Sum of PFAS	----	0.0002	mg/kg	0.0003	0.0003	0.0	No Limit
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg	0.0003	0.0003	0.0	No Limit
		EP231X: Sum of PFAS (WA DER List)	----	0.0002	mg/kg	0.0003	0.0003	0.0	No Limit

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: **SOIL**

				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: 5500708)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	0.0011 mg/kg	101	72.0	128
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	0.00125 mg/kg	99.2	73.0	123
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	0.00118 mg/kg	92.8	67.0	130
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	0.00119 mg/kg	103	70.0	132
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	0.00116 mg/kg	102	68.0	136
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	0.0012 mg/kg	102	59.0	134
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5500708)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	0.00625 mg/kg	84.6	71.0	135
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	0.00125 mg/kg	98.4	69.0	132
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	0.00125 mg/kg	96.4	70.0	132
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	0.00125 mg/kg	95.2	71.0	131
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	110	69.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	96.8	72.0	129
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	0.00125 mg/kg	103	69.0	133
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	109	64.0	136
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	99.2	69.0	135
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	106	66.0	139
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	0.00125 mg/kg	114	69.0	133
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5500708)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	0.00125 mg/kg	98.4	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	0.00312 mg/kg	114	59.6	143
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	0.00312 mg/kg	86.0	62.8	140
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	0.00312 mg/kg	105	61.5	139
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	0.00312 mg/kg	94.2	61.9	139
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	0.00125 mg/kg	100	63.0	144
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	0.00125 mg/kg	108	61.0	139
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5500708)								

Sub-Matrix: **SOIL**

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: 5500708) - continued								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	0.00117 mg/kg	100	62.0	145
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	0.00118 mg/kg	97.9	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	0.0012 mg/kg	92.1	65.0	137
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	0.0012 mg/kg	93.8	54.8	124
EP231P: PFAS Sums (QCLot: 5500708)								
EP231X: Sum of PFAS	---	0.0002	mg/kg	<0.0002	---	---	---	---
EP231X: Sum of PFHxS and PFOS	355-46-4/17 63-23-1	0.0002	mg/kg	<0.0002	---	---	---	---
EP231X: Sum of PFAS (WA DER List)	---	0.0002	mg/kg	<0.0002	---	---	---	---

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: **SOIL**

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: 5500708)							
EP2317564-046	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0011 mg/kg	111	72.0	128
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.00117 mg/kg	120	73.0	123
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.00118 mg/kg	91.0	67.0	130
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.00119 mg/kg	95.0	70.0	132
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.00116 mg/kg	95.6	68.0	136
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0012 mg/kg	95.0	59.0	134
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5500708)							
EP2317564-046	Anonymous	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.00625 mg/kg	89.7	71.0	135
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.00125 mg/kg	91.7	69.0	132
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.00125 mg/kg	116	70.0	132
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.00125 mg/kg	86.5	71.0	131
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.00125 mg/kg	95.9	69.0	133
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.00125 mg/kg	95.2	72.0	129
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.00125 mg/kg	84.4	69.0	133
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.00125 mg/kg	98.0	64.0	136
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.00125 mg/kg	97.2	69.0	135
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.00125 mg/kg	110	66.0	139
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.00125 mg/kg	116	69.0	133
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5500708)							

Sub-Matrix: **SOIL**

				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: 5500708) - continued							
EP2317564-046	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.00125 mg/kg	108	48.0	128
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.00312 mg/kg	115	60.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.00312 mg/kg	80.1	60.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.00312 mg/kg	106	60.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.00312 mg/kg	103	60.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.00125 mg/kg	93.2	63.0	144
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.00125 mg/kg	109	61.0	139
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5500708)							
EP2317564-046	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.00117 mg/kg	110	62.0	145
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.00118 mg/kg	97.7	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0012 mg/kg	88.3	65.0	137
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0012 mg/kg	94.6	60.0	130

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **EP2317691**	Page	: 1 of 4
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Telephone	: +61-8-9406 1301
Project	: WA_0089_PFASOMP_23	Date Samples Received	: 13-Dec-2023
Site	: Stirling SD - MB	Issue Date	: 21-Dec-2023
Sampler	: [redacted]	No. of samples received	: 4
Order number	: pfas-omp/Stirling	No. of samples analysed	: 4

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: **SOIL**

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
EA055: Moisture Content (Dried @ 105-110°C)								
HDPE Soil Jar (EA055)								
0089_SD367_231213,	0089_QC116_231213,	**13-Dec-2023**	**----**	----	----	**18-Dec-2023**	27-Dec-2023	✓
0089_SD345_231213,	0089_SD369_231213							
EP231A: Perfluoroalkyl Sulfonic Acids								
HDPE Soil Jar (EP231X)								
0089_SD367_231213,	0089_QC116_231213,	**13-Dec-2023**	**19-Dec-2023**	10-Jun-2024	✓	**20-Dec-2023**	28-Jan-2024	✓
0089_SD345_231213,	0089_SD369_231213							
EP231B: Perfluoroalkyl Carboxylic Acids								
HDPE Soil Jar (EP231X)								
0089_SD367_231213,	0089_QC116_231213,	**13-Dec-2023**	**19-Dec-2023**	10-Jun-2024	✓	**20-Dec-2023**	28-Jan-2024	✓
0089_SD345_231213,	0089_SD369_231213							
EP231C: Perfluoroalkyl Sulfonamides								
HDPE Soil Jar (EP231X)								
0089_SD367_231213,	0089_QC116_231213,	**13-Dec-2023**	**19-Dec-2023**	10-Jun-2024	✓	**20-Dec-2023**	28-Jan-2024	✓
0089_SD345_231213,	0089_SD369_231213							
EP231D: (n:2) Fluorotelomer Sulfonic Acids								
HDPE Soil Jar (EP231X)								
0089_SD367_231213,	0089_QC116_231213,	**13-Dec-2023**	**19-Dec-2023**	10-Jun-2024	✓	**20-Dec-2023**	28-Jan-2024	✓
0089_SD345_231213,	0089_SD369_231213							
EP231P: PFAS Sums								
HDPE Soil Jar (EP231X)								
0089_SD367_231213,	0089_QC116_231213,	**13-Dec-2023**	**19-Dec-2023**	10-Jun-2024	✓	**20-Dec-2023**	28-Jan-2024	✓
0089_SD345_231213,	0089_SD369_231213							

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: **SOIL**

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)							
Moisture Content	EA055	2	11	**18.18**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	20	**5.00**	**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
Moisture Content	EA055	SOIL	In house: A gravimetric procedure based on weight loss over a 12 hour drying period at 105-110 degrees C. This method is compliant with NEPM Schedule B(3).
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	SOIL	In-house: Analysis of soils by solvent extraction followed by LC-Electrospray-MS-MS, Negative Mode using MRM using internal standard quantitation. Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to a portion of soil which is then extracted with MTBE and an ion pairing reagent. A portion of extract is exchanged into the analytical solvent mixture, combined with an equal volume reagent water and 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
QuECheRS Extraction of Solids	* ORG71	SOIL	In house: Sequential extractions with Acetonitrile/Methanol by shaking. Extraction efficiency aided by the addition of salts under acidic conditions. Where relevant, interferences from co-extracted organics are removed with dispersive clean-up media (dSPE). The extract is either diluted or concentrated and exchanged into the analytical solvent.

ALSCompass
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ALS

Environmental Division
Perth
Work Order Reference
EP2317693

Telephone - 61-8-9406 1301

Custody Document for Submissions via ALS Compass App

Project: WA_0059_PFASCMP_23 **Client:** Stantec **Project Manager:** [redacted]

ALS Compass COC Reference: 61562; 61565; 61534; 61532; 61516; 61523; 61521; 61520; 61533 **# Samples:** 2 Eskies **Phone:**

Sampler: [redacted]

Turnaround Requirements: Standard _____ Urgent _____ **Phone:**

Special Instructions:

Custody:

Relinquished by:	Received by:	Relinquished by:	Received by:
[redacted]	[redacted]		
Date / Time: 8/12/23	Date / Time: 13/12@1700.	Date / Time:	Date / Time:

CHAIN OF CUSTODY

COC#: **61564** *ALS Laboratory:* EP Perth Environmental

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

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP_23

SITE: Stirling SD - JS

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER [redacted]

PRIMARY SAMPLER [redacted]

CONTACT PH: [redacted]

QUOTE NO: SY/139/19 B

SAMPLER MOBILE: [redacted]

/ ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES 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 Sediments SEDIMENT	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
001	0089_SD411		13/12/2023 10:31 AM	SOIL	ALS: 1 Non ALS: 0	No	X		
002	0089_SD413		13/12/2023 10:31 AM	SOIL	ALS: 1 Non ALS: 0	No	X		
003	0089_SD415		13/12/2023 10:30 AM	SOIL	ALS: 1 Non ALS: 0	No	X		

CHAIN OF CUSTODY

COC#: **61564** *ALS Laboratory:* EP Perth Environmental

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

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP_23

SITE: Stirling SD - JS

ORDER NO: pfas-cmp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted]

QUOTE NO: SY/139/19 B

SAMPLER MOBILE: [redacted] / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES 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	0089_SD411	HDPE Soil Jar	200 mL	00621122024475	Grey	No	
002	0089_SD413	HDPE Soil Jar	200 mL	00621122024439	Grey	No	
003	0089_SD415	HDPE Soil Jar	200 mL	00621122024430	Grey	No	

Total Bottle Count: ALS: 3, Non ALS: 0

SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : **EP2317693**

Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: Customer Services EP
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
E-mail	: [redacted]stantec.com	E-mail	: ALSEnviro.Perth@alsglobal.com
Telephone	: ----	Telephone	: +61-8-9406 1301
Facsimile	: ----	Facsimile	: +61-8-9406 1399
Project	: WA_0089_PFASOMP_23	Page	: 1 of 2
Order number	: pfas-omp/Stirling	Quote number	: ES2022MWHAUS0002 (SY/139/19 B)
C-O-C number	: 61564	QC Level	: NEPM 2013 B3 & ALS QC Standard
Site	: Stirling SD - JS		
Sampler	: [redacted]		

Dates

Date Samples Received	: 13-Dec-2023 17:00	Issue Date	: 16-Dec-2023
Client Requested Due Date	: 22-Dec-2023	Scheduled Reporting Date	: **22-Dec-2023**

Delivery Details

Mode of Delivery	: Carrier	Security Seal	: Not Available
No. of coolers/boxes	: 2	Temperature	: 6.7 - Ice present
Receipt Detail	:	No. of samples received / analysed	: 3 / 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 see scanned COC for sample discrepencies: extra samples , samples not received etc.
- Please direct any queries related to sample condition / numbering / breakages to Sample Receipt (Samples.Perth@alsglobal.com)
- Analytical work for this work order will be conducted at ALS Environmental Perth.
- Please direct any turnaround / technical queries to the laboratory contact designated above.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months) from receipt of samples.
- **pH analysis should be conducted within 6 hours of sampling.**
- **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.**
- 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: **SOIL**

Laboratory sample ID	Sampling date / time	Sample ID	SOIL - EA055-103 Moisture Content	SOIL - EP231X (solids) PFAS - Full Suite (28 analytes)
EP2317693-001	13-Dec-2023 10:31	0089_SD411_231213	✓	✓
EP2317693-002	13-Dec-2023 10:31	0089_SD413_231213	✓	✓
EP2317693-003	13-Dec-2023 10:30	0089_SD415_231213	✓	✓

Proactive Holding Time Report

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

Requested Deliverables

[redacted]
- A4 - AU Tax Invoice (INV) — Email — [redacted]cardno.com.au

DERP LAB REPORTS
- EDI Format - ESDAT (ESDAT) — Email — derp.labreports@esdat.com.au

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

CERTIFICATE OF ANALYSIS

Work Order	: **EP2317693**	Page	: 1 of 5
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: Customer Services EP
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: +61-8-9406 1301
Project	: WA_0089_PFASOMP_23	Date Samples Received	: 13-Dec-2023 17:00
Order number	: pfas-omp/Stirling	Date Analysis Commenced	: 18-Dec-2023
C-O-C number	: 61564	Issue Date	: 21-Dec-2023 15:13
Sampler	: [redacted]		
Site	: Stirling SD - JS		
Quote number	: SY/139/19 B		
No. of samples received	: 3		
No. of samples analysed	: 3		

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]	Laboratory Manager (Perth)	Perth Inorganics, Wangara, WA
[redacted]	Senior Organic Chemist	Perth Organics, Wangara, WA

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.

- 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: SEDIMENT (Matrix: SOIL)			Sample ID	0089_SD411_231213	0089_SD413_231213	0089_SD415_231213	----	----
			Sampling date / time	13-Dec-2023 10:31	13-Dec-2023 10:31	13-Dec-2023 10:30	----	----
Compound	CAS Number	LOR	Unit	EP2317693-001	EP2317693-002	EP2317693-003	--------	--------
				Result	Result	Result	----	----
EA055: Moisture Content (Dried @ 105-110°C)								
Moisture Content	----	0.1	%	20.1	23.2	26.0	----	----
EP231A: Perfluoroalkyl Sulfonic Acids								
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	----	----
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	----	----
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	----	----
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	----	----
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	----	----
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	----	----
EP231B: Perfluoroalkyl Carboxylic Acids								
Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	<0.001	<0.001	----	----
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	----	----
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	----	----
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	----	----
Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	----	----
Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	----	----
Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	----	----
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	----	----
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	----	----
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	----	----
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	----	----
EP231C: Perfluoroalkyl Sulfonamides								
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	----	----

Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)				Sample ID	0089_SD411_231213	0089_SD413_231213	0089_SD415_231213	----	----
				Sampling date / time	13-Dec-2023 10:31	13-Dec-2023 10:31	13-Dec-2023 10:30	----	----
Compound	CAS Number	LOR	Unit		EP2317693-001	EP2317693-002	EP2317693-003	--------	--------
					Result	Result	Result	----	----
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	----	----
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	----	----
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	----	----
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	----	----
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	----	----
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	----	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	----	----
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	----	----
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	----	----
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	----	----
EP231P: PFAS Sums									
Sum of PFAS	---	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	----	----
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	----	----
Sum of PFAS (WA DER List)	---	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	----	----
EP231S: PFAS Surrogate									
13C4-PFOS	---	0.0002	%		99.0	93.5	87.0	----	----
13C8-PFOA	---	0.0002	%		106	100	102	----	----

Surrogate Control Limits

Sub-Matrix: **SEDIMENT**		Recovery Limits (%)	
Compound	*CAS Number*	*Low*	*High*
EP231S: PFAS Surrogate			
13C4-PFOS	---	76	136
13C8-PFOA	---	78	131

QUALITY CONTROL REPORT

Work Order	: **EP2317693**	Page	: 1 of 7
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: Customer Services EP
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: +61-8-9406 1301
Project	: WA_0089_PFASOMP_23	Date Samples Received	: 13-Dec-2023
Order number	: pfas-omp/Stirling	Date Analysis Commenced	: 18-Dec-2023
C-O-C number	: 61564	Issue Date	: 21-Dec-2023
Sampler	: [redacted]		
Site	: Stirling SD - JS		
Quote number	: SY/139/19 B		
No. of samples received	: 3		
No. of samples analysed	: 3		

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]	Laboratory Manager (Perth)	Perth Inorganics, Wangara, WA
[redacted]	Senior Organic Chemist	Perth Organics, Wangara, WA

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: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EA055: Moisture Content (Dried @ 105-110°C) (QC Lot: 5499343)									
EP2317691-001	Anonymous	EA055: Moisture Content	----	0.1	%	28.5	27.9	2.2	0% - 20%
EP2317763-001	Anonymous	EA055: Moisture Content	----	0.1 (1.0)*	%	2.5	2.6	4.6	No Limit
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 5500708)									
EP2317564-045	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
EP2317691-002	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	0.0003	0.0003	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 5500708)									
EP2317564-045	Anonymous	EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit

Sub-Matrix: **SOIL**

Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Laboratory Duplicate (DUP) Report					
				LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 5500708) - continued									
EP2317564-045	Anonymous	EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	<0.001	0.0	No Limit
EP2317691-002	Anonymous	EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	<0.001	0.0	No Limit
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 5500708)									
EP2317564-045	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448 09 7	0 0005	mg/kg	0 0005	0 0005	0 0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
EP2317691-002	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991 50 6	0 0002	mg/kg	0 0002	0 0002	0 0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit

Sub-Matrix: **SOIL**

				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: 5500708) - continued									
EP2317691-002	Anonymous	EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 5500708)									
EP2317564-045	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
EP2317691-002	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
EP231P: PFAS Sums (QC Lot: 5500708)									
EP2317564-045	Anonymous	EP231X: Sum of PFAS	---	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Sum of PFAS (WA DER List)	---	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
EP2317691-002	Anonymous	EP231X: Sum of PFAS	---	0.0002	mg/kg	0.0003	0.0003	0.0	No Limit
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg	0.0003	0.0003	0.0	No Limit
		EP231X: Sum of PFAS (WA DER List)	---	0.0002	mg/kg	0.0003	0.0003	0.0	No Limit

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: **SOIL**

				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: 5500708)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	0.0011 mg/kg	101	72.0	128
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	0.00125 mg/kg	99.2	73.0	123
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	0.00118 mg/kg	92.8	67.0	130
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	0.00119 mg/kg	103	70.0	132
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	0.00116 mg/kg	102	68.0	136
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	0.0012 mg/kg	102	59.0	134
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5500708)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	0.00625 mg/kg	84.6	71.0	135
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	0.00125 mg/kg	98.4	69.0	132
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	0.00125 mg/kg	96.4	70.0	132
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	0.00125 mg/kg	95.2	71.0	131
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	110	69.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	96.8	72.0	129
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	0.00125 mg/kg	103	69.0	133
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	109	64.0	136
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	99.2	69.0	135
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	106	66.0	139
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	0.00125 mg/kg	114	69.0	133
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5500708)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	0.00125 mg/kg	98.4	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	0.00312 mg/kg	114	59.6	143
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	0.00312 mg/kg	86.0	62.8	140
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	0.00312 mg/kg	105	61.5	139
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	0.00312 mg/kg	94.2	61.9	139
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	0.00125 mg/kg	100	63.0	144
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	0.00125 mg/kg	108	61.0	139
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5500708)								

Sub-Matrix: **SOIL**

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: 5500708) - continued								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	0.00117 mg/kg	100	62.0	145
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	0.00118 mg/kg	97.9	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	0.0012 mg/kg	92.1	65.0	137
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	0.0012 mg/kg	93.8	54.8	124
EP231P: PFAS Sums (QCLot: 5500708)								
EP231X: Sum of PFAS	---	0.0002	mg/kg	<0.0002	---	---	---	---
EP231X: Sum of PFHxS and PFOS	355-46-4/17 63-23-1	0.0002	mg/kg	<0.0002	---	---	---	---
EP231X: Sum of PFAS (WA DER List)	---	0.0002	mg/kg	<0.0002	---	---	---	---

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: **SOIL**

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: 5500708)							
EP2317564-046	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0011 mg/kg	111	72.0	128
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.00117 mg/kg	120	73.0	123
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.00118 mg/kg	91.0	67.0	130
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.00119 mg/kg	95.0	70.0	132
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.00116 mg/kg	95.6	68.0	136
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0012 mg/kg	95.0	59.0	134
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5500708)							
EP2317564-046	Anonymous	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.00625 mg/kg	89.7	71.0	135
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.00125 mg/kg	91.7	69.0	132
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.00125 mg/kg	116	70.0	132
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.00125 mg/kg	86.5	71.0	131
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.00125 mg/kg	95.9	69.0	133
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.00125 mg/kg	95.2	72.0	129
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.00125 mg/kg	84.4	69.0	133
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.00125 mg/kg	98.0	64.0	136
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.00125 mg/kg	97.2	69.0	135
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.00125 mg/kg	110	66.0	139
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.00125 mg/kg	116	69.0	133
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5500708)							

Sub-Matrix: **SOIL**

				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: 5500708) - continued							
EP2317564-046	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.00125 mg/kg	108	48.0	128
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.00312 mg/kg	115	60.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.00312 mg/kg	80.1	60.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.00312 mg/kg	106	60.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.00312 mg/kg	103	60.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.00125 mg/kg	93.2	63.0	144
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.00125 mg/kg	109	61.0	139
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5500708)							
EP2317564-046	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.00117 mg/kg	110	62.0	145
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.00118 mg/kg	97.7	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0012 mg/kg	88.3	65.0	137
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0012 mg/kg	94.6	60.0	130

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **EP2317693**	Page	: 1 of 4
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Telephone	: +61-8-9406 1301
Project	: WA_0089_PFASOMP_23	Date Samples Received	: 13-Dec-2023
Site	: Stirling SD - JS	Issue Date	: 21-Dec-2023
Sampler	: [redacted] [redacted]	No. of samples received	: 3
Order number	: pfas-omp/Stirling	No. of samples analysed	: 3

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: **SOIL**

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
EA055: Moisture Content (Dried @ 105-110°C)							
HDPE Soil Jar (EA055)							
0089_SD411_231213, 0089_SD413_231213, 0089_SD415_231213	**13-Dec-2023**	----	----	----	**18-Dec-2023**	27-Dec-2023	✓
EP231A: Perfluoroalkyl Sulfonic Acids							
HDPE Soil Jar (EP231X)							
0089_SD411_231213, 0089_SD413_231213, 0089_SD415_231213	**13-Dec-2023**	**19-Dec-2023**	10-Jun-2024	✓	**20-Dec-2023**	28-Jan-2024	✓
EP231B: Perfluoroalkyl Carboxylic Acids							
HDPE Soil Jar (EP231X)							
0089_SD411_231213, 0089_SD413_231213, 0089_SD415_231213	**13-Dec-2023**	**19-Dec-2023**	10-Jun-2024	✓	**20-Dec-2023**	28-Jan-2024	✓
EP231C: Perfluoroalkyl Sulfonamides							
HDPE Soil Jar (EP231X)							
0089_SD411_231213, 0089_SD413_231213, 0089_SD415_231213	**13-Dec-2023**	**19-Dec-2023**	10-Jun-2024	✓	**20-Dec-2023**	28-Jan-2024	✓
EP231D: (n:2) Fluorotelomer Sulfonic Acids							
HDPE Soil Jar (EP231X)							
0089_SD411_231213, 0089_SD413_231213, 0089_SD415_231213	**13-Dec-2023**	**19-Dec-2023**	10-Jun-2024	✓	**20-Dec-2023**	28-Jan-2024	✓
EP231P: PFAS Sums							
HDPE Soil Jar (EP231X)							
0089_SD411_231213, 0089_SD413_231213, 0089_SD415_231213	**13-Dec-2023**	**19-Dec-2023**	10-Jun-2024	✓	**20-Dec-2023**	28-Jan-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: **SOIL**

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)							
Moisture Content	EA055	2	11	**18.18**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	20	**5.00**	**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
Moisture Content	EA055	SOIL	In house: A gravimetric procedure based on weight loss over a 12 hour drying period at 105-110 degrees C. This method is compliant with NEPM Schedule B(3).
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	SOIL	In-house: Analysis of soils by solvent extraction followed by LC-Electrospray-MS-MS, Negative Mode using MRM using internal standard quantitation. Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to a portion of soil which is then extracted with MTBE and an ion pairing reagent. A portion of extract is exchanged into the analytical solvent mixture, combined with an equal volume reagent water and 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
QuECheRS Extraction of Solids	* ORG71	SOIL	In house: Sequential extractions with Acetonitrile/Methanol by shaking. Extraction efficiency aided by the addition of salts under acidic conditions. Where relevant, interferences from co-extracted organics are removed with dispersive clean-up media (dSPE). The extract is either diluted or concentrated and exchanged into the analytical solvent.

ALSCompass
SAMPLING *Intelligence*

Environmental Division
Perth
Work Order Reference
EP2317700

Telephone : +61-8-9406 1301

Custody Document for Submissions via ALS Compass App

Project: WA_0059_PFASOMP_23 **Client:** Stantec **Project Manager:** [redacted]

ALS Compass COC Reference: 61564; 61565; 61534; 61532; 61516; 61523; 61521; 61520; 61533 **# Samples:** 2 Eskies **Phone:**

Sampler: [redacted]

Turnaround Requirements: Standard _____ Urgent _____ **Phone:**

Special Instructions:

Custody:

Relinquished by:	Received by:	Relinquished by:	Received by:
[redacted]	[redacted]		
Date / Time: 8/12/23	Date / Time: 13/12@1700.	Date / Time:	Date / Time:

CHAIN OF CUSTODY

COC#: 61516 *ALS Laboratory:* EP Perth Environmental

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

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP_23

SITE: Stirling GW - CG

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES 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	WA OMP Water Suite WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
001	0089_MW257		13/12/2023 06:53 AM	WATER	ALS: 3 Non ALS: 0	No	X		
002	0089_MW258		13/12/2023 07:08 AM	WATER	ALS: 3 Non ALS: 0	No	X		
003	0089_MW259		13/12/2023 07:21 AM	WATER	ALS: 3 Non ALS: 0	No	X		
004	0089_QC114		13/12/2023 07:25 AM	WATER	ALS: 3 Non ALS: 0	No	X		
005	0089_MW256		13/12/2023 07:40 AM	WATER	ALS: 3 Non ALS: 0	No	X		
006	0089_MW255		13/12/2023 07:51 AM	WATER	ALS: 3 Non ALS: 0	No	X		
007	0089_MW242		13/12/2023 08:12 AM	WATER	ALS: 3 Non ALS: 0	No	X		

CHAIN OF CUSTODY

COC#: **61516** *ALS Laboratory:* EP Perth Environmental

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

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP_23

SITE: Stirling GW - CG

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted] SAMPLER MOBILE [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES 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	WA OMP Water Suite WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
008	0089_MW288		13/12/2023 08:48 AM	WATER	ALS: 5 Non ALS: 0	No	X		
009	0089_MW202		13/12/2023 09:34 AM	WATER	ALS: 3 Non ALS: 0	No	X		
010	0089_QC117		13/12/2023 09:35 AM	WATER	ALS: 3 Non ALS: 0	No	X		
011	0089_MW233		13/12/2023 10:40 AM	WATER	ALS: 5 Non ALS: 0	No	X		

CHAIN OF CUSTODY

(ALS) COC#: 61516 ALS Laboratory: EP Perth Environmental

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

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP_23

SITE: Stirling GW - CG

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES 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	0089_MW257	Clear Plastic Bottle - Natural	125 mL	00070522229638	Green	No	
001	0089_MW257	HDPE (no PTFE)	20 mL	00352309068116	Grey	No	
001	0089_MW257	HDPE (no PTFE)	20 mL	00352309068192	Grey	No	
002	0089_MW258	Clear Plastic Bottle - Natural	125 mL	00070522229561	Green	No	
002	0089_MW258	HDPE (no PTFE)	20 mL	00352309068203	Grey	No	
002	0089_MW258	HDPE (no PTFE)	20 mL	00352309068209	Grey	No	
003	0089_MW259	Clear Plastic Bottle - Natural	125 mL	00070522229877	Green	No	
003	0089_MW259	HDPE (no PTFE)	20 mL	00352309068064	Grey	No	
003	0089_MW259	HDPE (no PTFE)	20 mL	00352309068030	Grey	No	
004	0089_QC114	Clear Plastic Bottle - Natural	125 mL	00070522229785	Green	No	
004	0089_QC114	HDPE (no PTFE)	20 mL	00352309068021	Grey	No	
004	0089_QC114	HDPE (no PTFE)	20 mL	00352309067887	Grey	No	
005	0089_MW256	Clear Plastic Bottle - Natural	125 mL	00070522229579	Green	No	
005	0089_MW256	HDPE (no PTFE)	20 mL	00352309068148	Grey	No	
005	0089_MW256	HDPE (no PTFE)	20 mL	00352309067982	Grey	No	
006	0089_MW255	Clear Plastic Bottle - Natural	125 mL	00070522229660	Green	No	
006	0089_MW255	HDPE (no PTFE)	20 mL	00352309068401	Grey	No	
006	0089_MW255	HDPE (no PTFE)	20 mL	00352309068265	Grey	No	
007	0089_MW242	Clear Plastic Bottle - Natural	125 mL	00070522229583	Green	No	
007	0089_MW242	HDPE (no PTFE)	20 mL	00352309067905	Grey	No	
007	0089_MW242	HDPE (no PTFE)	20 mL	00352309067944	Grey	No	
008	0089_MW288	HDPE (no PTFE)	20 mL	00352309068228	Grey	No	
008	0089_MW288	HDPE (no PTFE)	20 mL	00352309068123	Grey	No	
008	0089_MW288	Clear Plastic Bottle - Natural	125 mL	00070522229853	Green	No	
008	0089_MW288	HDPE (no PTFE)	20 mL	00352309068403	Grey	No	
008	0089_MW288	HDPE (no PTFE)	20 mL	00352309068271	Grey	No	

CHAIN OF CUSTODY

COC#: **61516** *ALS Laboratory:* EP Perth Environmental

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

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP_23

SITE: Stirling GW - CG

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES 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:

009	0089_MW202	Clear Plastic Bottle - Natural	125 mL	00070522229647	Green	No	
009	0089_MW202	HDPE (no PTFE)	20 mL	00352309068188	Grey	No	
009	0089_MW202	HDPE (no PTFE)	20 mL	00352309068256	Grey	No	
010	0089_QC117	HDPE (no PTFE)	20 mL	00352309068118	Grey	No	
010	0089_QC117	HDPE (no PTFE)	20 mL	00352309068171	Grey	No	
010	0089_QC117	Clear Plastic Bottle - Natural	125 mL	00070522229585	Green	No	
011	0089_MW233	HDPE (no PTFE)	20 mL	00352309067968	Grey	No	
011	0089_MW233	HDPE (no PTFE)	20 mL	00352309068043	Grey	No	
011	0089_MW233	Clear Plastic Bottle - Natural	125 mL	00070522229775	Green	No	
011	0089_MW233	HDPE (no PTFE)	20 mL	00352309068150	Grey	No	
011	0089_MW233	HDPE (no PTFE)	20 mL	00352309068392	Grey	No	

Total Bottle Count: ALS: 37, Non ALS: 0

SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : **EP2317700**

Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: Customer Services EP
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
E-mail	: [redacted]stantec.com	E-mail	: ALSEnviro.Perth@alsglobal.com
Telephone	: ----	Telephone	: +61-8-9406 1301
Facsimile	: ----	Facsimile	: +61-8-9406 1399
Project	: WA_0089_PFASOMP_23	Page	: 1 of 2
Order number	: pfas-omp/Stirling	Quote number	: ES2022MWHAUS0002 (SY/139/19 B)
C-O-C number	: 61516	QC Level	: NEPM 2013 B3 & ALS QC Standard
Site	: Stirling GW - CG		
Sampler	: [redacted]		

Dates

Date Samples Received	: 13-Dec-2023 17:00	Issue Date	: 16-Dec-2023
Client Requested Due Date	: 22-Dec-2023	Scheduled Reporting Date	: **22-Dec-2023**

Delivery Details

Mode of Delivery	: Carrier	Security Seal	: Not Available
No. of coolers/boxes	: 2	Temperature	: 6.7 - Ice present
Receipt Detail	:	No. of samples received / analysed	: 11 / 11

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 see scanned COC for sample discrepencies: extra samples , samples not received etc.
- Please direct any queries related to sample condition / numbering / breakages to Sample Receipt (Samples.Perth@alsglobal.com)
- Analytical work for this work order will be conducted at ALS Environmental Perth.
- Please direct any turnaround / technical queries to the laboratory contact designated above.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months) from receipt of samples.
- **pH analysis should be conducted within 6 hours of sampling.**
- **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.**
- 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)	WATER - NT-01 & 02 Ca, Mg, Na, K, Cl, SO4, Alkalinity
EP2317700-001	13-Dec-2023 06:53	0089_MW257_231213	✓	✓
EP2317700-002	13-Dec-2023 07:08	0089_MW258_231213	✓	✓
EP2317700-003	13-Dec-2023 07:21	0089_MW259_231213	✓	✓
EP2317700-004	13-Dec-2023 07:25	0089_QC114_231213	✓	✓
EP2317700-005	13-Dec-2023 07:40	0089_MW256_231213	✓	✓
EP2317700-006	13-Dec-2023 07:51	0089_MW255_231213	✓	✓
EP2317700-007	13-Dec-2023 08:12	0089_MW242_231213	✓	✓
EP2317700-008	13-Dec-2023 08:48	0089_MW288_231213	✓	✓
EP2317700-009	13-Dec-2023 09:34	0089_MW202_231213	✓	✓
EP2317700-010	13-Dec-2023 09:35	0089_QC117_231213	✓	✓
EP2317700-011	13-Dec-2023 10:40	0089_MW233_231213	✓	✓

Proactive Holding Time Report

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

Requested Deliverables

[redacted]
- A4 - AU Tax Invoice (INV) — Email — [redacted]cardno.com.au

DERP LAB REPORTS
- EDI Format - ESDAT (ESDAT) — Email — derp.labreports@esdat.com.au

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

CERTIFICATE OF ANALYSIS

Work Order	: **EP2317700**	Page	: 1 of 12
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: Customer Services EP
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: +61-8-9406 1301
Project	: WA_0089_PFASOMP_23	Date Samples Received	: 13-Dec-2023 17:00
Order number	: pfas-omp/Stirling	Date Analysis Commenced	: 19-Dec-2023
C-O-C number	: 61516	Issue Date	: 22-Dec-2023 15:37
Sampler	: [redacted] [redacted]		
Site	: Stirling GW - CG		
Quote number	: SY/139/19 B		
No. of samples received	: 11		
No. of samples analysed	: 11		

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]	Inorganics Supervisor	Perth Inorganics, Wangara, WA
[redacted]	Laboratory Manager (Perth)	Perth Inorganics, Wangara, WA
[redacted]	Senior Organic Chemist	Perth Organics, Wangara, WA

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.
- As per QWI – EN55-3 Data Interpreting Procedures, Ionic balances are typically calculated using Major Anions - Chloride, Alkalinity and Sulfate; and Major Cations - Calcium, Magnesium, Potassium and Sodium. Where applicable and dependent upon sample matrix, the Ionic Balance may also include the additional contribution of Ammonia, Dissolved Metals by ICPMS and H+ to the Cations and Nitrate, SiO2 and Fluoride to the Anions.
- Sodium Adsorption Ratio (where reported): Where results for Na, Ca or Mg are <LOR, a concentration at half the reported LOR is incorporated into the SAR calculation. This represents a conservative approach for Na relative to the assumption that <LOR = zero concentration and a conservative approach for Ca & Mg relative to the assumption that <LOR is equivalent to the LOR concentration.
- 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.
- ED045G: The presence of Thiocyanate, Thiosulfate and Sulfite can positively contribute to the chloride result, thereby may bias results higher than expected. Results should be scrutinised accordingly.

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW257_231213	0089_MW258_231213	0089_MW259_231213	0089_QC114_231213	0089_MW256_231213
				Sampling date / time	13-Dec-2023 06:53	13-Dec-2023 07:08	13-Dec-2023 07:21	13-Dec-2023 07:25	13-Dec-2023 07:40
Compound	CAS Number	LOR	Unit		EP2317700-001	EP2317700-002	EP2317700-003	EP2317700-004	EP2317700-005
					Result	Result	Result	Result	Result
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	<1	<1	<1	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	<1	<1	<1	<1
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		216	387	285	285	385
Total Alkalinity as CaCO3	---	1	mg/L		216	387	285	285	385
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		19	106	14	14	30
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		37	114	29	30	139
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		70	141	95	98	118
Magnesium	7439-95-4	1	mg/L		9	38	16	17	24
Sodium	7440-23-5	1	mg/L		26	83	25	23	94
Potassium	7440-09-7	1	mg/L		5	17	3	3	5
EN055: Ionic Balance									
ø Total Anions	---	0.01	meq/L		5.75	13.2	6.80	6.83	12.2
ø Total Cations	---	0.01	meq/L		5.49	14.2	7.22	7.37	12.1
ø Ionic Balance	---	0.01	%		2.33	3.85	2.98	3.76	0.65
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		<0.02	4.99	<0.02	<0.02	2.62
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		<0.02	5.51	<0.02	<0.02	3.15
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		0.16	13.6	0.05	0.05	8.24
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		<0.02	0.67	<0.02	<0.02	0.28
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		0.05	6.03	0.06	0.06	3.82
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW257_231213	0089_MW258_231213	0089_MW259_231213	0089_QC114_231213	0089_MW256_231213
				Sampling date / time	13-Dec-2023 06:53	13-Dec-2023 07:08	13-Dec-2023 07:21	13-Dec-2023 07:25	13-Dec-2023 07:40
Compound	CAS Number	LOR	Unit		EP2317700-001	EP2317700-002	EP2317700-003	EP2317700-004	EP2317700-005
					Result	Result	Result	Result	Result
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		<0.1	**1.3**	<0.1	<0.1	**0.7**
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		**0.20**	**1.78**	**0.06**	**0.06**	**0.90**
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		**0.13**	**7.04**	**0.04**	**0.04**	**5.50**
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		<0.02	**0.72**	<0.02	<0.02	**0.38**
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		**0.01**	**0.62**	<0.01	<0.01	**0.34**
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
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									

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW257_231213	0089_MW258_231213	0089_MW259_231213	0089_QC114_231213	0089_MW256_231213
				Sampling date / time	13-Dec-2023 06:53	13-Dec-2023 07:08	13-Dec-2023 07:21	13-Dec-2023 07:25	13-Dec-2023 07:40
Compound	CAS Number	LOR	Unit		EP2317700-001	EP2317700-002	EP2317700-003	EP2317700-004	EP2317700-005
					Result	Result	Result	Result	Result
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
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	**0.16**	<0.05	<0.05	**0.36**
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		**0.55**	**42.4**	**0.21**	**0.21**	**26.3**
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		**0.21**	**19.6**	**0.11**	**0.11**	**12.1**
Sum of PFAS (WA DER List)	---	0.01	µg/L		**0.55**	**36.2**	**0.21**	**0.21**	**22.9**
EP231S: PFAS Surrogate									
13C4-PFOS	---	0.02	%		**88.9**	**93.4**	**90.8**	**97.6**	**86.1**
13C8-PFOA	---	0.02	%		**95.8**	**109**	**93.3**	**98.2**	**102**

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW255_231213	0089_MW242_231213	0089_MW288_231213	0089_MW202_231213	0089_QC117_231213
				Sampling date / time	13-Dec-2023 07:51	13-Dec-2023 08:12	13-Dec-2023 08:48	13-Dec-2023 09:34	13-Dec-2023 09:35
Compound	CAS Number	LOR	Unit		EP2317700-006	EP2317700-007	EP2317700-008	EP2317700-009	EP2317700-010
					Result	Result	Result	Result	Result
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	<1	<1	<1	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	<1	<1	<1	<1
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		246	175	312	355	355
Total Alkalinity as CaCO3	---	1	mg/L		246	175	312	355	355
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		35	24	29	48	45
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		48	21	37	162	162
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		84	68	103	94	94
Magnesium	7439-95-4	1	mg/L		13	11	18	25	25
Sodium	7440-23-5	1	mg/L		54	13	37	139	137
Potassium	7440-09-7	1	mg/L		4	2	7	11	11
EN055: Ionic Balance									
ø Total Anions	---	0.01	meq/L		7.00	4.59	7.88	12.7	12.6
ø Total Cations	---	0.01	meq/L		7.71	4.92	8.41	13.1	13.0
ø Ionic Balance	---	0.01	%		4.86	3.44	3.24	1.61	1.52
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		0.44	<0.02	<0.02	<0.02	<0.02
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		0.48	<0.02	<0.02	<0.02	<0.02
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		3.00	<0.01	<0.01	0.02	0.02
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		0.30	0.01	0.33	0.04	0.04
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW255_231213	0089_MW242_231213	0089_MW288_231213	0089_MW202_231213	0089_QC117_231213
				Sampling date / time	13-Dec-2023 07:51	13-Dec-2023 08:12	13-Dec-2023 08:48	13-Dec-2023 09:34	13-Dec-2023 09:35
Compound	CAS Number	LOR	Unit		EP2317700-006	EP2317700-007	EP2317700-008	EP2317700-009	EP2317700-010
					Result	Result	Result	Result	Result
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		**0.16**	<0.02	<0.02	<0.02	<0.02
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		**0.78**	<0.02	<0.02	<0.02	<0.02
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		**0.08**	<0.02	<0.02	<0.02	<0.02
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		**0.02**	<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
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									

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW255_231213	0089_MW242_231213	0089_MW288_231213	0089_MW202_231213	0089_QC117_231213
				Sampling date / time	13-Dec-2023 07:51	13-Dec-2023 08:12	13-Dec-2023 08:48	13-Dec-2023 09:34	13-Dec-2023 09:35
Compound	CAS Number	LOR	Unit		EP2317700-006	EP2317700-007	EP2317700-008	EP2317700-009	EP2317700-010
					Result	Result	Result	Result	Result
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
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		**5.36**	**0.01**	**0.33**	**0.06**	**0.06**
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		**3.30**	**0.01**	**0.33**	**0.06**	**0.06**
Sum of PFAS (WA DER List)	---	0.01	µg/L		**4.88**	**0.01**	**0.33**	**0.06**	**0.06**
EP231S: PFAS Surrogate									
13C4-PFOS	---	0.02	%		**89.2**	**89.7**	**92.7**	**99.0**	**90.0**
13C8-PFOA	---	0.02	%		**92.8**	**95.1**	**93.9**	**107**	**94.4**

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW233_231213	----	----	----	----
				Sampling date / time	13-Dec-2023 10:40	----	----	----	----
Compound	CAS Number	LOR	Unit	EP2317700-011	--------	--------	--------	--------	
				Result	—	—	—	—	
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	----	----	----	----	
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	----	----	----	----	
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	158	----	----	----	----	
Total Alkalinity as CaCO3	----	1	mg/L	158	----	----	----	----	
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	8	----	----	----	----	
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L	28	----	----	----	----	
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L	54	----	----	----	----	
Magnesium	7439-95-4	1	mg/L	8	----	----	----	----	
Sodium	7440-23-5	1	mg/L	26	----	----	----	----	
Potassium	7440-09-7	1	mg/L	3	----	----	----	----	
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L	4.11	----	----	----	----	
ø Total Cations	----	0.01	meq/L	4.56	----	----	----	----	
ø Ionic Balance	----	0.01	%	5.16	----	----	----	----	
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	0.05	----	----	----	----	
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	----	----	----	----	
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	0.12	----	----	----	----	
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	----	----	----	----	

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW233_231213	----	----	----	----
				Sampling date / time	13-Dec-2023 10:40	---	---	---	---
Compound	CAS Number	LOR	Unit		EP2317700-011	--------	--------	--------	--------
					Result	---	---	---	---
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	----	----	----	----
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									

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW233_231213	----	----	----	----
				Sampling date / time	13-Dec-2023 10:40	---	---	---	---
Compound	CAS Number	LOR	Unit		EP2317700-011	--------	--------	--------	--------
					Result	---	---	---	---
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
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		**0.17**	----	----	----	----
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		**0.17**	----	----	----	----
Sum of PFAS (WA DER List)	---	0.01	µg/L		**0.17**	----	----	----	----
EP231S: PFAS Surrogate									
13C4-PFOS	---	0.02	%		**94.3**	----	----	----	----
13C8-PFOA	---	0.02	%		**106**	----	----	----	----

Surrogate Control Limits

Sub-Matrix: GROUNDWATER		Recovery Limits (%)	
Compound	CAS Number	Low	High
EP231S: PFAS Surrogate			
13C4-PFOS	---	65	140
13C8-PFOA	---	71	133

QUALITY CONTROL REPORT

Work Order	: **EP2317700**	Page	: 1 of 13
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: Customer Services EP
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: +61-8-9406 1301
Project	: WA_0089_PFASOMP_23	Date Samples Received	: 13-Dec-2023
Order number	: pfas-omp/Stirling	Date Analysis Commenced	: 19-Dec-2023
C-O-C number	: 61516	Issue Date	: 22-Dec-2023
Sampler	: [redacted]		
Site	: Stirling GW - CG		
Quote number	: SY/139/19 B		
No. of samples received	: 11		
No. of samples analysed	: 11		

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]	Inorganics Supervisor	Perth Inorganics, Wangara, WA
[redacted]	Laboratory Manager (Perth)	Perth Inorganics, Wangara, WA
[redacted]	Senior Organic Chemist	Perth Organics, Wangara, WA

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 (%)*
ED037P: Alkalinity by PC Titrator (QC Lot: 5502956)									
EP2317670-002	Anonymous	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	186	187	0.0	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	186	187	0.0	0% - 20%
EP2317700-003	0089_MW259_231213	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	285	282	0.9	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	285	282	0.9	0% - 20%
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QC Lot: 5501013)									
EP2317700-001	0089_MW257_231213	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	19	18	0.0	0% - 50%
EP2317700-011	0089_MW233_231213	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	8	8	0.0	No Limit
ED045G: Chloride by Discrete Analyser (QC Lot: 5501014)									
EP2317700-001	0089_MW257_231213	ED045G: Chloride	16887-00-6	1	mg/L	37	37	0.0	0% - 20%
EP2317700-011	0089_MW233_231213	ED045G: Chloride	16887-00-6	1	mg/L	28	30	7.4	0% - 20%
ED093F: Dissolved Major Cations (QC Lot: 5500564)									
EP2317690-001	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	578	594	2.8	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	1470	1490	1.2	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	11900	12000	1.1	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	460	454	1.3	0% - 20%
EP2317700-009	0089_MW202_231213	ED093F Calcium	7440-70-2	1	mg/L	94	92	2.2	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	25	24	0.0	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	139	136	2.4	0% - 20%

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 (%)
ED093F: Dissolved Major Cations (QC Lot: 5500564) - continued									
EP2317700-009	0089_MW202_231213	ED093F: Potassium	7440-09-7	1	mg/L	11	11	0.0	0% - 50%
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 5503827)									
EP2317700 011	0089 MW233 231213	EP231X: Perfluorohexane sulfonic acid (PFHxS)	355 46 4	0 01	µg/L	0 05	0 04	0 0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	0.12	0.11	11.1	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
EP2317849-002	Anonymous	EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	28.8	32.1	10.7	0% - 20%
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	62.8	69.7	10.4	0% - 20%
		EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	1.29	1.24	3.6	0% - 20%
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	5.68	6.29	10.2	0% - 20%
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	4.98	5.47	9.5	0% - 20%
		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: 5503834)									
EP2317690-003	Anonymous	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
EP2317729-002	Anonymous	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
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 5503827)									
EP2317700-011	0089_MW233_231213	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

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: 5503827) - continued									
EP2317700-011	0089_MW233_231213	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
EP2317849-002	Anonymous	EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	4.14	4.17	0.9	0% - 20%
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	0.75	0.77	2.4	0% - 20%
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	6.23	6.27	0.6	0% - 20%
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	1.98	1.87	5.7	0% - 20%
		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	0.6	0.6	0.0	No Limit
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 5503834)									
EP2317690-003	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
EP2317729-002	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: 5503827)									

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: 5503827) - continued									
EP2317700-011	0089_MW233_231213	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
EP2317849-002	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
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 5503834)									
EP2317690-003	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
EP2317729-002	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: 5503834) - continued									
EP2317729-002	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: 5503827)									
EP2317700-011	0089_MW233_231213	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
EP2317849-002	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
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 5503834)									
EP2317690-003	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
EP2317729-002	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

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 (%)
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 5503834) - continued									
EP2317729-002	Anonymous	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: 5503827)									
EP2317700-011	0089_MW233_231213	EP231X: Sum of PFAS	---	0.01	µg/L	0.17	0.15	12.5	0% - 50%
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	0.17	0.15	12.5	0% - 50%
		EP231X: Sum of PFAS (WA DER List)	---	0.01	µg/L	0.17	0.15	12.5	0% - 50%
EP2317849-002	Anonymous	EP231X: Sum of PFAS	---	0.01	µg/L	117	128	9.1	0% - 20%
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	91.6	102	10.5	0% - 20%
		EP231X: Sum of PFAS (WA DER List)	---	0.01	µg/L	106	117	9.1	0% - 20%
EP231P: PFAS Sums (QC Lot: 5503834)									
EP2317690-003	Anonymous	EP231X: Sum of PFAS	---	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Sum of PFAS (WA DER List)	---	0.01	µg/L	<0.01	<0.01	0.0	No Limit
EP2317729-002	Anonymous	EP231X: Sum of PFAS	---	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Sum of PFAS (WA DER List)	---	0.01	µg/L	<0.01	<0.01	0.0	No Limit

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
ED037P: Alkalinity by PC Titrator (QCLot: 5502956)								
ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	---	---	---	---
ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	---	---	---	---
ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	<1	---	---	---	---
ED037-P: Total Alkalinity as CaCO3	---	1	mg/L	<1	20 mg/L	95.0	85.1	126
				<1	200 mg/L	95.9	90.5	111
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 5501013)								
ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<1	25 mg/L	101	89.9	112
				<1	500 mg/L	102	89.9	112
ED045G: Chloride by Discrete Analyser (QCLot: 5501014)								
ED045G: Chloride	16887-00-6	1	mg/L	<1	10 mg/L	100	88.6	113
				<1	1000 mg/L	99.6	88.6	113
ED093F: Dissolved Major Cations (QCLot: 5500564)								
ED093F: Calcium	7440-70-2	1	mg/L	<1	50 mg/L	105	86.5	117
ED093F: Magnesium	7439-95-4	1	mg/L	<1	50 mg/L	101	88.4	110
ED093F: Sodium	7440-23-5	1	mg/L	<1	50 mg/L	100	91.4	113
ED093F: Potassium	7440-09-7	1	mg/L	<1	50 mg/L	103	84.6	108
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5503827)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.2218 µg/L	98.7	72.0	130
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.2352 µg/L	117	71.0	127
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	0.2373 µg/L	98.0	68.0	131
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.238 µg/L	105	69.0	134
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.232 µg/L	92.2	65.0	140
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.241 µg/L	89.4	53.0	142
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5503834)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.2218 µg/L	92.9	72.0	130
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.2352 µg/L	106	71.0	127
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	0.2373 µg/L	87.0	68.0	131
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.238 µg/L	101	69.0	134
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.232 µg/L	93.8	65.0	140
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.241 µg/L	92.5	53.0	142

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: 5503827)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	1.25 µg/L	105	73.0	129
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	0.25 µg/L	88.6	72.0	129
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	0.25 µg/L	112	72.0	129
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	0.25 µg/L	103	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	109	69.0	130
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	0.25 µg/L	87.0	71.0	129
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	0.25 µg/L	97.0	69.0	133
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	0.25 µg/L	93.0	72.0	134
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	0.25 µg/L	88.2	65.0	144
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	0.25 µg/L	102	71.0	132
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5503834)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	1.25 µg/L	87.8	73.0	129
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	0.25 µg/L	93.6	72.0	129
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	0.25 µg/L	87.4	72.0	129
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	0.25 µg/L	92.8	72.0	130
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	0.25 µg/L	93.2	71.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	0.25 µg/L	101	69.0	130
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	0.25 µg/L	87.4	71.0	129
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	0.25 µg/L	95.2	69.0	133
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	0.25 µg/L	86.6	72.0	134
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	0.25 µg/L	77.4	65.0	144
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	0.25 µg/L	82.4	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5503827)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.25 µg/L	74.8	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	0.625 µg/L	108	68.0	141
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	0.625 µg/L	90.2	60.5	138
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	0.625 µg/L	103	68.3	134
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	0.625 µg/L	96.1	62.2	138
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	0.25 µg/L	91.2	65.0	136
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	0.25 µg/L	122	61.0	135

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: 5503834)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.25 µg/L	89.8	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	0.625 µg/L	122	68.0	141
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	0.625 µg/L	81.2	60.5	138
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	0.625 µg/L	90.8	68.3	134
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	0.625 µg/L	113	62.2	138
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	0.25 µg/L	101	65.0	136
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	0.25 µg/L	88.6	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5503827)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.2343 µg/L	116	63.0	143
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	0.2378 µg/L	107	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	0.24 µg/L	115	67.0	138
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	0.241 µg/L	96.3	64.2	133
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5503834)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.2343 µg/L	106	63.0	143
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	0.2378 µg/L	97.4	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	0.24 µg/L	97.1	67.0	138
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	0.241 µg/L	92.3	64.2	133
EP231P: PFAS Sums (QCLot: 5503827)								
EP231X: Sum of PFAS	---	0.01	µg/L	<0.01	---	---	---	---
EP231X: Sum of PFHxS and PFOS	355-46-4/17 63-23-1	0.01	µg/L	<0.01	---	---	---	---
EP231X: Sum of PFAS (WA DER List)	---	0.01	µg/L	<0.01	---	---	---	---
EP231P: PFAS Sums (QCLot: 5503834)								
EP231X: Sum of PFAS	---	0.01	µg/L	<0.01	---	---	---	---
EP231X: Sum of PFHxS and PFOS	355-46-4/17 63-23-1	0.01	µg/L	<0.01	---	---	---	---
EP231X: Sum of PFAS (WA DER List)	---	0.01	µg/L	<0.01	---	---	---	---

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**

Matrix Spike (MS) Report

Sub-Matrix: **WATER**

Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report: Spike Concentration	Matrix Spike (MS) Report: SpikeRecovery(%) MS	Matrix Spike (MS) Report: Acceptable Limits (%) Low	Matrix Spike (MS) Report: Acceptable Limits (%) High
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 5501013)							
EP2317700-001	0089_MW257_231213	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	100 mg/L	125	70.4	130
ED045G: Chloride by Discrete Analyser (QCLot: 5501014)							
EP2317700-001	0089_MW257_231213	ED045G: Chloride	16887-00-6	200 mg/L	119	70.0	130
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5503827)							
EP2317849-001	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.2218 µg/L	97.3	72.0	129
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.232 µg/L	122	71.0	127
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.2352 µg/L	109	68.0	129
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.238 µg/L	110	69.0	134
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.232 µg/L	92.1	65.0	140
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.241 µg/L	91.3	53.0	129
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5503834)							
EP2317700-008	0089_MW288_231213	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.2218 µg/L	102	72.0	129
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.232 µg/L	126	71.0	127
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.2352 µg/L	85.3	68.0	129
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.238 µg/L	103	69.0	134
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.232 µg/L	98.8	65.0	140
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.241 µg/L	90.0	53.0	129
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5503827)							
EP2317849-001	Anonymous	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	1.25 µg/L	102	73.0	142
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.25 µg/L	104	72.0	129
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.25 µg/L	111	72.0	129
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.25 µg/L	108	72.0	130
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.25 µg/L	114	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	92.0	71.0	134
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.25 µg/L	103	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	118	65.0	144
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.25 µg/L	115	71.0	132
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5503834)							
EP2317700-008	0089_MW288_231213	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	1.25 µg/L	85.4	73.0	142
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.25 µg/L	89.4	72.0	129
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.25 µg/L	85.7	72.0	129
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.25 µg/L	88.8	72.0	130
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.25 µg/L	84.4	71.0	133
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.25 µg/L	98.4	69.0	130
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.25 µg/L	81.1	71.0	134
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.25 µg/L	91.4	69.0	133

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: 5503834) - continued							
EP2317700-008	0089_MW288_231213	EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.25 µg/L	93.0	72.0	134
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.25 µg/L	77.6	65.0	144
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.25 µg/L	91.2	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5503827)							
EP2317849-001	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.25 µg/L	75.2	59.0	135
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.625 µg/L	124	70.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.625 µg/L	93.4	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.625 µg/L	89.8	70.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.625 µg/L	105	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.25 µg/L	87.4	65.0	136
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.25 µg/L	114	61.0	135
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5503834)							
EP2317700-008	0089_MW288_231213	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.25 µg/L	92.4	59.0	135
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.625 µg/L	121	70.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.625 µg/L	77.6	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.625 µg/L	87.7	70.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.625 µg/L	92.4	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.25 µg/L	99.4	65.0	136
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.25 µg/L	91.8	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5503827)							
EP2317849-001	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.234 µg/L	114	63.0	143
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.2378 µg/L	111	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.24 µg/L	106	67.0	138
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.2415 µg/L	90.2	70.0	130
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5503834)							
EP2317700-008	0089_MW288_231213	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.234 µg/L	104	63.0	143
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.2378 µg/L	97.2	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.24 µg/L	101	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: 5503834) - continued							
EP2317700-008	0089_MW288_231213	EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.2415 µg/L	86.3	70.0	130

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **EP2317700**	Page	: 1 of 5
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Telephone	: +61-8-9406 1301
Project	: WA_0089_PFASOMP_23	Date Samples Received	: 13-Dec-2023
Site	: Stirling GW - CG	Issue Date	: 22-Dec-2023
Sampler	: [redacted]	No. of samples received	: 11
Order number	: pfas-omp/Stirling	No. of samples analysed	: 11

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
ED037P: Alkalinity by PC Titrator							
Clear Plastic Bottle - Natural (ED037-P)							
0089_MW257_231213, 0089_MW258_231213, 0089_MW259_231213, 0089_QC114_231213, 0089_MW256_231213, 0089_MW255_231213, 0089_MW242_231213, 0089_MW288_231213, 0089_MW202_231213, 0089_QC117_231213, 0089_MW233_231213	**13-Dec-2023**	----	----	----	**19-Dec-2023**	27-Dec-2023	✓
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA							
Clear Plastic Bottle - Natural (ED041G)							
0089 MW257 231213, 0089 MW258 231213, 0089 MW259 231213, 0089 QC114 231213, 0089 MW256 231213, 0089 MW255 231213, 0089 MW242 231213, 0089 MW288 231213, 0089 MW202 231213, 0089 QC117 231213, 0089 MW233 231213	**13-Dec-2023**	----	----	----	**22-Dec-2023**	10-Jan-2024	✓
ED045G: Chloride by Discrete Analyser							
Clear Plastic Bottle - Natural (ED045G)							
0089_MW257_231213, 0089_MW258_231213, 0089_MW259_231213, 0089_QC114_231213, 0089_MW256_231213, 0089_MW255_231213, 0089_MW242_231213, 0089_MW288_231213, 0089_MW202_231213, 0089_QC117_231213, 0089_MW233_231213	**13-Dec-2023**	----	----	----	**22-Dec-2023**	10-Jan-2024	✓
ED093F: Dissolved Major Cations							
Clear Plastic Bottle - Natural (ED093F)							
0089_MW257_231213, 0089_MW258_231213, 0089_MW259_231213, 0089_QC114_231213, 0089_MW256_231213, 0089_MW255_231213, 0089_MW242_231213, 0089_MW288_231213, 0089_MW202_231213, 0089_QC117_231213, 0089_MW233_231213	**13-Dec-2023**	----	----	----	**19-Dec-2023**	20-Dec-2023	✓

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)							
0089_MW257_231213, 0089_MW258_231213, 0089_MW259_231213, 0089_QC114_231213, 0089_MW256_231213, 0089_MW255_231213, 0089_MW242_231213, 0089_MW288_231213, 0089_MW202_231213, 0089_QC117_231213, 0089_MW233_231213	**13-Dec-2023**	**19-Dec-2023**	10-Jun-2024	✓	**19-Dec-2023**	10-Jun-2024	✓
EP231B: Perfluoroalkyl Carboxylic Acids							
HDPE (no PTFE) (EP231X)							
0089_MW257_231213, 0089_MW258_231213, 0089_MW259_231213, 0089_QC114_231213, 0089_MW256_231213, 0089_MW255_231213, 0089_MW242_231213, 0089_MW288_231213, 0089_MW202_231213, 0089_QC117_231213, 0089_MW233_231213	**13-Dec-2023**	**19-Dec-2023**	10-Jun-2024	✓	**19-Dec-2023**	10-Jun-2024	✓
EP231C: Perfluoroalkyl Sulfonamides							
HDPE (no PTFE) (EP231X)							
0089_MW257_231213, 0089_MW258_231213, 0089_MW259_231213, 0089_QC114_231213, 0089_MW256_231213, 0089_MW255_231213, 0089_MW242_231213, 0089_MW288_231213, 0089_MW202_231213, 0089_QC117_231213, 0089_MW233_231213	**13-Dec-2023**	**19-Dec-2023**	10-Jun-2024	✓	**19-Dec-2023**	10-Jun-2024	✓
EP231D: (n:2) Fluorotelomer Sulfonic Acids							
HDPE (no PTFE) (EP231X)							
0089_MW257_231213, 0089_MW258_231213, 0089_MW259_231213, 0089_QC114_231213, 0089_MW256_231213, 0089_MW255_231213, 0089_MW242_231213, 0089_MW288_231213, 0089_MW202_231213, 0089_QC117_231213, 0089_MW233_231213	**13-Dec-2023**	**19-Dec-2023**	10-Jun-2024	✓	**19-Dec-2023**	10-Jun-2024	✓
EP231P: PFAS Sums							
HDPE (no PTFE) (EP231X)							
0089_MW257_231213, 0089_MW258_231213, 0089_MW259_231213, 0089_QC114_231213, 0089_MW256_231213, 0089_MW255_231213, 0089_MW242_231213, 0089_MW288_231213, 0089_MW202_231213, 0089_QC117_231213, 0089_MW233_231213	**13-Dec-2023**	**19-Dec-2023**	10-Jun-2024	✓	**19-Dec-2023**	10-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)							
Alkalinity by Auto Titrator	ED037-P	2	19	**10.53**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	4	40	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Alkalinity by Auto Titrator	ED037-P	2	19	**10.53**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	40	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Alkalinity by Auto Titrator	ED037-P	1	19	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	40	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Chloride by Discrete Analyser	ED045G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	40	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	20	**5.00**	**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
Alkalinity by Auto Titrator	ED037-P	WATER	In house: Referenced to APHA 2320 B This procedure determines alkalinity by automated measurement (e.g. PC Titrate) on a settled supernatant aliquot of the sample using pH 4.5 for indicating the total alkalinity end-point. This method is compliant with NEPM Schedule B(3)
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	WATER	In house: Referenced to APHA 4500-SO4. Dissolved sulfate is determined in a 0.45um filtered sample. Sulfate ions are converted to a barium sulfate suspension in an acetic acid medium with barium chloride. Light absorbance of the BaSO4 suspension is measured by a photometer and the SO4-2 concentration is determined by comparison of the reading with a standard curve. This method is compliant with NEPM Schedule B(3)
Chloride by Discrete Analyser	ED045G	WATER	In house: Referenced to APHA 4500 Cl - G.The thiocyanate ion is liberated from mercuric thiocyanate through sequestration of mercury by the chloride ion to form non-ionised mercuric chloride. In the presence of ferric ions the liberated thiocynate forms highly-coloured ferric thiocynate which is measured at 480 nm.
Major Cations - Dissolved	ED093F	WATER	In house: Referenced to APHA 3120 and 3125; USEPA SW 846 - 6010 and 6020; Cations are determined by either ICP-AES or ICP-MS techniques. This method is compliant with NEPM Schedule B(3) Sodium Adsorption Ratio is calculated from Ca, Mg and Na which determined by ALS in house method QWI-EN/ED093F. This method is compliant with NEPM Schedule B(3) Hardness parameters are calculated based on APHA 2340 B. This method is compliant with NEPM Schedule B(3)
Ionic Balance by PCT DA and Turbi SO4 DA	* EN055 - PG	WATER	In house: Referenced to APHA 1030F. This method is compliant with NEPM Schedule B(3)
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.

ALSCompass
SAMPLING *Intelligence*

Environmental Division
Perth
Work Order Reference
EP2317701

Telephone - 61-8-9406 1301

Custody Document for Submissions via ALS Compass App

Project: WA_0089_PFASDMP_23 **Client:** Stantec **Project Manager:** [redacted]

ALS Compass COC Reference: 61564; 61565; 61534; 61532; 61516; 61523; 61521; 61520; 61533 **# Samples:** 2 Eskies **Phone:**

Turnaround Requirements: Standard Urgent **Sampler:** [redacted] **Phone:**

Special Instructions:

Custody:

Relinquished by:	Received by:	Relinquished by:	Received by:
[redacted]	[redacted]		
Date / Time: 8/12/23	Date / Time: 13/12@1700.	Date / Time:	Date / Time:

CHAIN OF CUSTODY

ALS COC#: 61532 ALS Laboratory: EP Perth Environmental

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

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP_23

SITE: Stirling SW/PW - CG

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES 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	WA OMP Water Suite WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
001	0089_PW346		13/12/2023 08:50 AM	WATER	ALS: 3 Non ALS: 0	No	X		
002	0089-SW373		13/12/2023 08:51 AM	WATER	ALS: 5 Non ALS: 0	No	X		
003	0089_SW372		13/12/2023 08:52 AM	WATER	ALS: 3 Non ALS: 0	No	X		
004	0089_SW371		13/12/2023 09:39 AM	WATER	ALS: 3 Non ALS: 0	No	X		
005	0089_PW304		13/12/2023 09:41 AM	WATER	ALS: 3 Non ALS: 0	No	X		
006	0089_SW305		13/12/2023 09:41 AM	WATER	ALS: 3 Non ALS: 0	No	X		
007	0089_PW368		13/12/2023 09:42 AM	WATER	ALS: 3 Non ALS: 0	No	X		

CHAIN OF CUSTODY

ALS COC#: 61532 ALS Laboratory: EP Perth Environmental

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

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP_23

SITE: Stirling SW/PW - CG

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES 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	0089_PW346	Clear Plastic Bottle - Natural	125 mL	00070522229806	Green	No	
001	0089_PW346	HDPE (no PTFE)	20 mL	00352309068158	Grey	No	
001	0089_PW346	HDPE (no PTFE)	20 mL	00352309068139	Grey	No	
002	0089-SW373	Clear Plastic Bottle - Natural	125 mL	00070522229595	Green	No	
002	0089-SW373	HDPE (no PTFE)	20 mL	00352309068157	Grey	No	
002	0089-SW373	HDPE (no PTFE)	20 mL	00352309067891	Grey	No	
002	0089-SW373	HDPE (no PTFE)	20 mL	00352309068291	Grey	No	
002	0089-SW373	HDPE (no PTFE)	20 mL	00352309068239	Grey	No	
003	0089_SW372	HDPE (no PTFE)	20 mL	00352309068106	Grey	No	
003	0089_SW372	Clear Plastic Bottle - Natural	125 mL	00070522229588	Green	No	
003	0089_SW372	HDPE (no PTFE)	20 mL	00352309068214	Grey	No	
004	0089_SW371	Clear Plastic Bottle - Natural	125 mL	00070522229564	Green	No	
004	0089_SW371	HDPE (no PTFE)	20 mL	00352309068195	Grey	No	
004	0089_SW371	HDPE (no PTFE)	20 mL	00352309067889	Grey	No	
005	0089_PW304	HDPE (no PTFE)	20 mL	00352309068172	Grey	No	
005	0089_PW304	HDPE (no PTFE)	20 mL	00352309068036	Grey	No	
005	0089_PW304	Clear Plastic Bottle - Natural	125 mL	00070522229571	Green	No	
006	0089_SW305	Clear Plastic Bottle - Natural	125 mL	00070522229586	Green	No	
006	0089_SW305	HDPE (no PTFE)	20 mL	00352309068048	Grey	No	
006	0089_SW305	HDPE (no PTFE)	20 mL	00352309067998	Grey	No	
007	0089_PW368	Clear Plastic Bottle - Natural	125 mL	00070522229714	Green	No	
007	0089_PW368	HDPE (no PTFE)	20 mL	00352309067920	Grey	No	
007	0089_PW368	HDPE (no PTFE)	20 mL	00352309068091	Grey	No	

Total Bottle Count: ALS: 23, Non ALS: 0

SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : **EP2317701**

Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: Customer Services EP
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
E-mail	: [redacted]stantec.com	E-mail	: ALSEnviro.Perth@alsglobal.com
Telephone	: ----	Telephone	: +61-8-9406 1301
Facsimile	: ----	Facsimile	: +61-8-9406 1399
Project	: WA_0089_PFASOMP_23	Page	: 1 of 2
Order number	: pfas-omp/Stirling	Quote number	: ES2022MWHAUS0002 (SY/139/19 B)
C-O-C number	: 61532	QC Level	: NEPM 2013 B3 & ALS QC Standard
Site	: Stirling SW/PW - CG		
Sampler	: [redacted]		

Dates

Date Samples Received	: 13-Dec-2023 17:00	Issue Date	: 16-Dec-2023
Client Requested Due Date	: 22-Dec-2023	Scheduled Reporting Date	: **22-Dec-2023**

Delivery Details

Mode of Delivery	: Carrier	Security Seal	: Not Available
No. of coolers/boxes	: 2	Temperature	: 6.7 - Ice present
Receipt Detail	:	No. of samples received / analysed	: 7 / 7

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 see scanned COC for sample discrepencies: extra samples , samples not received etc.
- Please direct any queries related to sample condition / numbering / breakages to Sample Receipt (Samples.Perth@alsglobal.com)
- Analytical work for this work order will be conducted at ALS Environmental Perth.
- Please direct any turnaround / technical queries to the laboratory contact designated above.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months) from receipt of samples.
- **pH analysis should be conducted within 6 hours of sampling.**
- **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.**
- 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)	WATER - NT-01 & 02 Ca, Mg, Na, K, Cl, SO4, Alkalinity
EP2317701-001	13-Dec-2023 08:50	0089_PW346_231213	✓	✓
EP2317701-002	13-Dec-2023 08:51	0089-SW373_231213	✓	✓
EP2317701-003	13-Dec-2023 08:52	0089_SW372_231213	✓	✓
EP2317701-004	13-Dec-2023 09:39	0089_SW371_231213	✓	✓
EP2317701-005	13-Dec-2023 09:41	0089_PW304_231213	✓	✓
EP2317701-006	13-Dec-2023 09:41	0089_SW305_231213	✓	✓
EP2317701-007	13-Dec-2023 09:42	0089_PW368_231213	✓	✓

Proactive Holding Time Report

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

Requested Deliverables

[redacted]
- A4 - AU Tax Invoice (INV) — Email — [redacted]cardno.com.au

DERP LAB REPORTS
- EDI Format - ESDAT (ESDAT) — Email — derp.labreports@esdat.com.au

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

CERTIFICATE OF ANALYSIS

Work Order	: **EP2317701**	Page	: 1 of 9
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: Customer Services EP
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: +61-8-9406 1301
Project	: WA_0089_PFASOMP_23	Date Samples Received	: 13-Dec-2023 17:00
Order number	: pfas-omp/Stirling	Date Analysis Commenced	: 19-Dec-2023
C-O-C number	: 61532	Issue Date	: 22-Dec-2023 15:46
Sampler	: [redacted] [redacted]		
Site	: Stirling SW/PW - CG		
Quote number	: SY/139/19 B		
No. of samples received	: 7		
No. of samples analysed	: 7		

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]	Inorganics Supervisor	Perth Inorganics, Wangara, WA
[redacted]	Laboratory Manager (Perth)	Perth Inorganics, Wangara, WA
[redacted]	Senior Organic Chemist	Perth Organics, Wangara, WA

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.
- As per QWI – EN55-3 Data Interpreting Procedures, Ionic balances are typically calculated using Major Anions - Chloride, Alkalinity and Sulfate; and Major Cations - Calcium, Magnesium, Potassium and Sodium. Where applicable and dependent upon sample matrix, the Ionic Balance may also include the additional contribution of Ammonia, Dissolved Metals by ICPMS and H+ to the Cations and Nitrate, SiO2 and Fluoride to the Anions.
- Sodium Adsorption Ratio (where reported): Where results for Na, Ca or Mg are <LOR, a concentration at half the reported LOR is incorporated into the SAR calculation. This represents a conservative approach for Na relative to the assumption that <LOR = zero concentration and a conservative approach for Ca & Mg relative to the assumption that <LOR is equivalent to the LOR concentration.
- 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.
- ED045G: The presence of Thiocyanate, Thiosulfate and Sulfite can positively contribute to the chloride result, thereby may bias results higher than expected. Results should be scrutinised accordingly.

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_PW346_231213	0089-SW373_231213	0089_SW372_231213	0089_SW371_231213	0089_PW304_231213
				Sampling date / time	13-Dec-2023 08:50	13-Dec-2023 08:51	13-Dec-2023 08:52	13-Dec-2023 09:39	13-Dec-2023 09:41
Compound	CAS Number	LOR	Unit		EP2317701-001	EP2317701-002	EP2317701-003	EP2317701-004	EP2317701-005
					Result	Result	Result	Result	Result
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	<1	<1	<1	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	<1	<1	<1	<1
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		252	142	155	155	288
Total Alkalinity as CaCO3	---	1	mg/L		252	142	155	155	288
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		267	2820	2690	2730	846
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		1390	19900	19100	19500	6310
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		57	420	428	441	156
Magnesium	7439-95-4	1	mg/L		130	1290	1240	1260	439
Sodium	7440-23-5	1	mg/L		803	10300	9950	10300	3160
Potassium	7440-09-7	1	mg/L		66	394	381	396	131
EN055: Ionic Balance									
ø Total Anions	---	0.01	meq/L		49.8	623	598	610	201
ø Total Cations	---	0.01	meq/L		50.2	585	566	584	185
ø Ionic Balance	---	0.01	%		0.36	3.12	2.74	2.19	4.31
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		0.06	0.02	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		3.57	0.08	0.10	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

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_PW346_231213	0089-SW373_231213	0089_SW372_231213	0089_SW371_231213	0089_PW304_231213
				Sampling date / time	13-Dec-2023 08:50	13-Dec-2023 08:51	13-Dec-2023 08:52	13-Dec-2023 09:39	13-Dec-2023 09:41
Compound	CAS Number	LOR	Unit		EP2317701-001	EP2317701-002	EP2317701-003	EP2317701-004	EP2317701-005
					Result	Result	Result	Result	Result
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
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									

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_PW346_231213	0089-SW373_231213	0089_SW372_231213	0089_SW371_231213	0089_PW304_231213
				Sampling date / time	13-Dec-2023 08:50	13-Dec-2023 08:51	13-Dec-2023 08:52	13-Dec-2023 09:39	13-Dec-2023 09:41
Compound	CAS Number	LOR	Unit		EP2317701-001	EP2317701-002	EP2317701-003	EP2317701-004	EP2317701-005
					Result	Result	Result	Result	Result
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
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		**3.63**	**0.10**	**0.14**	**0.01**	<0.01
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		**3.63**	**0.10**	**0.14**	**0.01**	<0.01
Sum of PFAS (WA DER List)	---	0.01	µg/L		**3.63**	**0.10**	**0.14**	**0.01**	<0.01
EP231S: PFAS Surrogate									
13C4-PFOS	---	0.02	%		**94.7**	**95.6**	**94.9**	**89.9**	**93.1**
13C8-PFOA	---	0.02	%		**93.4**	**95.2**	**92.1**	**114**	**93.2**

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_SW305_231213	0089_PW368_231213	----	----	----
				Sampling date / time	13-Dec-2023 09:41	13-Dec-2023 09:42	----	----	----
Compound	CAS Number	LOR	Unit		EP2317701-006	EP2317701-007	--------	--------	--------
					Result	Result	----	----	----
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	<1	----	----	----
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	<1	----	----	----
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		146	441	----	----	----
Total Alkalinity as CaCO3	----	1	mg/L		146	441	----	----	----
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		2780	3030	----	----	----
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		20000	23400	----	----	----
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		425	508	----	----	----
Magnesium	7439-95-4	1	mg/L		1240	1450	----	----	----
Sodium	7440-23-5	1	mg/L		10200	11800	----	----	----
Potassium	7440-09-7	1	mg/L		394	452	----	----	----
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		625	732	----	----	----
ø Total Cations	----	0.01	meq/L		577	670	----	----	----
ø Ionic Balance	----	0.01	%		3.99	4.46	----	----	----
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		<0.01	<0.01	----	----	----
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		<0.01	0.08	----	----	----
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	<0.02	----	----	----

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_SW305_231213	0089_PW368_231213	----	----	----
				Sampling date / time	13-Dec-2023 09:41	13-Dec-2023 09:42	----	----	----
Compound	CAS Number	LOR	Unit		EP2317701-006	EP2317701-007	--------	--------	--------
					Result	Result	—	—	—
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		<0.1	<0.1	----	----	----
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		<0.01	<0.01	----	----	----
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		<0.05	<0.05	----	----	----
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L		<0.02	<0.02	----	----	----
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L		<0.05	<0.05	----	----	----
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L		<0.05	<0.05	----	----	----
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L		<0.05	<0.05	----	----	----
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L		<0.05	<0.05	----	----	----
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L		<0.02	<0.02	----	----	----
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L		<0.02	<0.02	----	----	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids									

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_SW305_231213	0089_PW368_231213	----	----	----
				Sampling date / time	13-Dec-2023 09:41	13-Dec-2023 09:42	----	----	----
Compound	CAS Number	LOR	Unit		EP2317701-006	EP2317701-007	--------	--------	--------
					Result	Result	----	----	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L		<0.05	<0.05	----	----	----
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		<0.05	<0.05	----	----	----
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		<0.05	<0.05	----	----	----
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L		<0.05	<0.05	----	----	----
EP231P: PFAS Sums									
Sum of PFAS	---	0.01	µg/L		<0.01	**0.08**	----	----	----
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		<0.01	**0.08**	----	----	----
Sum of PFAS (WA DER List)	---	0.01	µg/L		<0.01	**0.08**	----	----	----
EP231S: PFAS Surrogate									
13C4-PFOS	---	0.02	%		**98.1**	**95.2**	----	----	----
13C8-PFOA	---	0.02	%		**103**	**106**	----	----	----

Surrogate Control Limits

Sub-Matrix: SURFACE WATER		Recovery Limits (%)	
Compound	CAS Number	Low	High
EP231S: PFAS Surrogate			
13C4-PFOS	---	65	140
13C8-PFOA	---	71	133

QUALITY CONTROL REPORT

Work Order	: **EP2317701**	Page	: 1 of 13
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: Customer Services EP
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: +61-8-9406 1301
Project	: WA_0089_PFASOMP_23	Date Samples Received	: 13-Dec-2023
Order number	: pfas-omp/Stirling	Date Analysis Commenced	: 19-Dec-2023
C-O-C number	: 61532	Issue Date	: 22-Dec-2023
Sampler	: [redacted]		
Site	: Stirling SW/PW - CG		
Quote number	: SY/139/19 B		
No. of samples received	: 7		
No. of samples analysed	: 7		

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]	Inorganics Supervisor	Perth Inorganics, Wangara, WA
[redacted]	Laboratory Manager (Perth)	Perth Inorganics, Wangara, WA
[redacted]	Senior Organic Chemist	Perth Organics, Wangara, WA

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 (%)
ED037P: Alkalinity by PC Titrator (QC Lot: 5505346)									
EP2317690-003	Anonymous	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	122	138	12.3	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	122	138	12.3	0% - 20%
EP2317701-007	0089_PW368_231213	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	441	441	0.0	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	441	441	0.0	0% - 20%
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QC Lot: 5501016)									
EP2317690-001	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	2650	2690	1.7	0% - 20%
EP2317701-004	0089_SW371_231213	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	2730	2730	0.0	0% - 20%
ED045G: Chloride by Discrete Analyser (QC Lot: 5501017)									
EP2317690-001	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	22500	22400	0.5	0% - 20%
EP2317701-004	0089_SW371_231213	ED045G: Chloride	16887-00-6	1	mg/L	19500	19600	0.3	0% - 20%
ED093F: Dissolved Major Cations (QC Lot: 5500564)									
EP2317690-001	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	578	594	2.8	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	1470	1490	1.2	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	11900	12000	1.1	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	460	454	1.3	0% - 20%
EP2317700-009	Anonymous	ED093F Calcium	7440-70-2	1	mg/L	94	92	2.2	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	25	24	0.0	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	139	136	2.4	0% - 20%

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 (%)
ED093F: Dissolved Major Cations (QC Lot: 5500564) - continued									
EP2317700-009	Anonymous	ED093F: Potassium	7440-09-7	1	mg/L	11	11	0.0	0% - 50%
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 5503827)									
EP2317700 011	Anonymous	EP231X: Perfluorohexane sulfonic acid (PFHxS)	355 46 4	0 01	µg/L	0 05	0 04	0 0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	0.12	0.11	11.1	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
EP2317849-002	Anonymous	EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	28.8	32.1	10.7	0% - 20%
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	62.8	69.7	10.4	0% - 20%
		EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	1.29	1.24	3.6	0% - 20%
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	5.68	6.29	10.2	0% - 20%
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	4.98	5.47	9.5	0% - 20%
		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: 5503834)									
EP2317690-003	Anonymous	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
EP2317729-002	Anonymous	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
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 5503827)									
EP2317700-011	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

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: 5503827) - continued									
EP2317700-011	Anonymous	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
EP2317849-002	Anonymous	EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	4.14	4.17	0.9	0% - 20%
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	0.75	0.77	2.4	0% - 20%
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	6.23	6.27	0.6	0% - 20%
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	1.98	1.87	5.7	0% - 20%
		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	0.6	0.6	0.0	No Limit
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 5503834)									
EP2317690-003	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
EP2317729-002	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: 5503827)									

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: 5503827) - continued									
EP2317700-011	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
EP2317849-002	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
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 5503834)									
EP2317690-003	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
EP2317729-002	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	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: 5503834) - continued									
EP2317729-002	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: 5503827)									
EP2317700-011	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
EP2317849-002	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
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 5503834)									
EP2317690-003	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
EP2317729-002	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

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: 5503834) - continued									
EP2317729-002	Anonymous	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: 5503827)									
EP2317700-011	Anonymous	EP231X: Sum of PFAS	---	0.01	µg/L	0.17	0.15	12.5	0% - 50%
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	0.17	0.15	12.5	0% - 50%
		EP231X: Sum of PFAS (WA DER List)	---	0.01	µg/L	0.17	0.15	12.5	0% - 50%
EP2317849-002	Anonymous	EP231X: Sum of PFAS	---	0.01	µg/L	117	128	9.1	0% - 20%
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	91.6	102	10.5	0% - 20%
		EP231X: Sum of PFAS (WA DER List)	---	0.01	µg/L	106	117	9.1	0% - 20%
EP231P: PFAS Sums (QC Lot: 5503834)									
EP2317690-003	Anonymous	EP231X: Sum of PFAS	---	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Sum of PFAS (WA DER List)	---	0.01	µg/L	<0.01	<0.01	0.0	No Limit
EP2317729-002	Anonymous	EP231X: Sum of PFAS	---	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Sum of PFAS (WA DER List)	---	0.01	µg/L	<0.01	<0.01	0.0	No Limit

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
ED037P: Alkalinity by PC Titrator (QCLot: 5505346)								
ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	---	---	---	---
ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	---	---	---	---
ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	<1	---	---	---	---
ED037-P: Total Alkalinity as CaCO3	---	1	mg/L	<1	20 mg/L	112	85.1	126
				<1	200 mg/L	102	90.5	111
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 5501016)								
ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<1	25 mg/L	97.3	89.9	112
				<1	500 mg/L	103	89.9	112
ED045G: Chloride by Discrete Analyser (QCLot: 5501017)								
ED045G: Chloride	16887-00-6	1	mg/L	<1	10 mg/L	97.3	88.6	113
				<1	1000 mg/L	98.6	88.6	113
ED093F: Dissolved Major Cations (QCLot: 5500564)								
ED093F: Calcium	7440-70-2	1	mg/L	<1	50 mg/L	105	86.5	117
ED093F: Magnesium	7439-95-4	1	mg/L	<1	50 mg/L	101	88.4	110
ED093F: Sodium	7440-23-5	1	mg/L	<1	50 mg/L	100	91.4	113
ED093F: Potassium	7440-09-7	1	mg/L	<1	50 mg/L	103	84.6	108
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5503827)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.2218 µg/L	98.7	72.0	130
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.2352 µg/L	117	71.0	127
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	0.2373 µg/L	98.0	68.0	131
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.238 µg/L	105	69.0	134
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.232 µg/L	92.2	65.0	140
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.241 µg/L	89.4	53.0	142
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5503834)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.2218 µg/L	92.9	72.0	130
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.2352 µg/L	106	71.0	127
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	0.2373 µg/L	87.0	68.0	131
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.238 µg/L	101	69.0	134
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.232 µg/L	93.8	65.0	140
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.241 µg/L	92.5	53.0	142

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: 5503827)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	1.25 µg/L	105	73.0	129
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	0.25 µg/L	88.6	72.0	129
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	0.25 µg/L	112	72.0	129
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	0.25 µg/L	103	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	109	69.0	130
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	0.25 µg/L	87.0	71.0	129
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	0.25 µg/L	97.0	69.0	133
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	0.25 µg/L	93.0	72.0	134
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	0.25 µg/L	88.2	65.0	144
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	0.25 µg/L	102	71.0	132
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5503834)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	1.25 µg/L	87.8	73.0	129
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	0.25 µg/L	93.6	72.0	129
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	0.25 µg/L	87.4	72.0	129
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	0.25 µg/L	92.8	72.0	130
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	0.25 µg/L	93.2	71.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	0.25 µg/L	101	69.0	130
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	0.25 µg/L	87.4	71.0	129
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	0.25 µg/L	95.2	69.0	133
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	0.25 µg/L	86.6	72.0	134
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	0.25 µg/L	77.4	65.0	144
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	0.25 µg/L	82.4	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5503827)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.25 µg/L	74.8	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	0.625 µg/L	108	68.0	141
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	0.625 µg/L	90.2	60.5	138
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	0.625 µg/L	103	68.3	134
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	0.625 µg/L	96.1	62.2	138
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	0.25 µg/L	91.2	65.0	136
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	0.25 µg/L	122	61.0	135

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: 5503834)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.25 µg/L	89.8	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	0.625 µg/L	122	68.0	141
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	0.625 µg/L	81.2	60.5	138
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	0.625 µg/L	90.8	68.3	134
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	0.625 µg/L	113	62.2	138
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	0.25 µg/L	101	65.0	136
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	0.25 µg/L	88.6	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5503827)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.2343 µg/L	116	63.0	143
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	0.2378 µg/L	107	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	0.24 µg/L	115	67.0	138
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	0.241 µg/L	96.3	64.2	133
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5503834)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.2343 µg/L	106	63.0	143
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	0.2378 µg/L	97.4	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	0.24 µg/L	97.1	67.0	138
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	0.241 µg/L	92.3	64.2	133
EP231P: PFAS Sums (QCLot: 5503827)								
EP231X: Sum of PFAS	---	0.01	µg/L	<0.01	---	---	---	---
EP231X: Sum of PFHxS and PFOS	355-46-4/17 63-23-1	0.01	µg/L	<0.01	---	---	---	---
EP231X: Sum of PFAS (WA DER List)	---	0.01	µg/L	<0.01	---	---	---	---
EP231P: PFAS Sums (QCLot: 5503834)								
EP231X: Sum of PFAS	---	0.01	µg/L	<0.01	---	---	---	---
EP231X: Sum of PFHxS and PFOS	355-46-4/17 63-23-1	0.01	µg/L	<0.01	---	---	---	---
EP231X: Sum of PFAS (WA DER List)	---	0.01	µg/L	<0.01	---	---	---	---

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**

Matrix Spike (MS) Report

Sub-Matrix: **WATER**

Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report: Spike Concentration	Matrix Spike (MS) Report: SpikeRecovery(%) MS	Matrix Spike (MS) Report: Acceptable Limits (%) Low	Matrix Spike (MS) Report: Acceptable Limits (%) High
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 5501016)							
EP2317690-001	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	100 mg/L	# Not Determined	70.4	130
ED045G: Chloride by Discrete Analyser (QCLot: 5501017)							
EP2317690-001	Anonymous	ED045G: Chloride	16887-00-6	200 mg/L	# Not Determined	70.0	130
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5503827)							
EP2317849-001	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.2218 µg/L	97.3	72.0	129
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.232 µg/L	122	71.0	127
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.2352 µg/L	109	68.0	129
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.238 µg/L	110	69.0	134
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.232 µg/L	92.1	65.0	140
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.241 µg/L	91.3	53.0	129
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5503834)							
EP2317700-008	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.2218 µg/L	102	72.0	129
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.232 µg/L	126	71.0	127
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.2352 µg/L	85.3	68.0	129
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.238 µg/L	103	69.0	134
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.232 µg/L	98.8	65.0	140
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.241 µg/L	90.0	53.0	129
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5503827)							
EP2317849-001	Anonymous	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	1.25 µg/L	102	73.0	142
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.25 µg/L	104	72.0	129
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.25 µg/L	111	72.0	129
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.25 µg/L	108	72.0	130
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.25 µg/L	114	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	92.0	71.0	134
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.25 µg/L	103	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	118	65.0	144
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.25 µg/L	115	71.0	132
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5503834)							
EP2317700-008	Anonymous	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	1.25 µg/L	85.4	73.0	142
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.25 µg/L	89.4	72.0	129
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.25 µg/L	85.7	72.0	129
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.25 µg/L	88.8	72.0	130
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.25 µg/L	84.4	71.0	133
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.25 µg/L	98.4	69.0	130

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: 5503834) - continued							
EP2317700-008	Anonymous	EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.25 µg/L	81.1	71.0	134
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.25 µg/L	91.4	69.0	133
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.25 µg/L	93.0	72.0	134
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.25 µg/L	77.6	65.0	144
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.25 µg/L	91.2	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5503827)							
EP2317849-001	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.25 µg/L	75.2	59.0	135
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.625 µg/L	124	70.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.625 µg/L	93.4	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.625 µg/L	89.8	70.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.625 µg/L	105	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.25 µg/L	87.4	65.0	136
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.25 µg/L	114	61.0	135
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5503834)							
EP2317700-008	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.25 µg/L	92.4	59.0	135
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.625 µg/L	121	70.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.625 µg/L	77.6	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.625 µg/L	87.7	70.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.625 µg/L	92.4	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.25 µg/L	99.4	65.0	136
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.25 µg/L	91.8	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5503827)							
EP2317849-001	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.234 µg/L	114	63.0	143
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.2378 µg/L	111	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.24 µg/L	106	67.0	138
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.2415 µg/L	90.2	70.0	130
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5503834)							
EP2317700-008	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.234 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: 5503834) - continued							
EP2317700-008	Anonymous	EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.2378 µg/L	97.2	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.24 µg/L	101	67.0	138
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.2415 µg/L	86.3	70.0	130

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **EP2317701**	Page	: 1 of 5
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Telephone	: +61-8-9406 1301
Project	: WA_0089_PFASOMP_23	Date Samples Received	: 13-Dec-2023
Site	: Stirling SW/PW - CG	Issue Date	: 22-Dec-2023
Sampler	: [redacted]	No. of samples received	: 7
Order number	: pfas-omp/Stirling	No. of samples analysed	: 7

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.**
- **Matrix Spike outliers exist - please see following pages for full details.**
- **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.**

Outliers : Quality Control Samples

Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

Matrix: **WATER**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
Matrix Spike (MS) Recoveries							
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA	EP2317690--001	Anonymous	**Sulfate as SO4 - Turbidimetric**	14808-79-8	Not Determined	---	**MS recovery not determined, background level greater than or equal to 4x spike level.**
ED045G: Chloride by Discrete Analyser	EP2317690--001	Anonymous	**Chloride**	16887-00-6	Not Determined	---	**MS recovery not determined, background level greater than or equal to 4x spike level.**

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*
ED037P: Alkalinity by PC Titrator							
Clear Plastic Bottle - Natural (ED037-P)							
0089_PW346_231213, 0089-SW373_231213, 0089_SW372_231213, 0089_SW371_231213, 0089_PW304_231213, 0089_SW305_231213, 0089_PW368_231213	**13-Dec-2023**	---	---	---	**20-Dec-2023**	27-Dec-2023	✓
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA							
Clear Plastic Bottle - Natural (ED041G)							
0089_PW346_231213, 0089-SW373_231213, 0089_SW372_231213, 0089_SW371_231213, 0089_PW304_231213, 0089_SW305_231213, 0089_PW368_231213	**13-Dec-2023**	---	---	---	**22-Dec-2023**	10-Jan-2024	✓
ED045G: Chloride by Discrete Analyser							
Clear Plastic Bottle - Natural (ED045G)							
0089 PW346 231213, 0089 SW373 231213, 0089 SW372 231213, 0089 SW371 231213, 0089 PW304 231213, 0089 SW305 231213, 0089 PW368 231213	**13-Dec-2023**	---	---	---	**22-Dec-2023**	10-Jan-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
ED093F: Dissolved Major Cations							
Clear Plastic Bottle - Natural (ED093F)							
0089_PW346_231213, 0089-SW373_231213, 0089_SW372_231213, 0089_SW371_231213, 0089_PW304_231213, 0089_SW305_231213, 0089_PW368_231213	**13-Dec-2023**	**----**	----	----	**19-Dec-2023**	20-Dec-2023	✓
EP231A: Perfluoroalkyl Sulfonic Acids							
HDPE (no PTFE) (EP231X)							
0089_PW346_231213, 0089-SW373_231213, 0089_SW372_231213, 0089_SW371_231213, 0089_PW304_231213, 0089_SW305_231213, 0089_PW368_231213	**13-Dec-2023**	**19-Dec-2023**	10-Jun-2024	✓	**19-Dec-2023**	10-Jun-2024	✓
EP231B: Perfluoroalkyl Carboxylic Acids							
HDPE (no PTFE) (EP231X)							
0089_PW346_231213, 0089-SW373_231213, 0089_SW372_231213, 0089_SW371_231213, 0089_PW304_231213, 0089_SW305_231213, 0089_PW368_231213	**13-Dec-2023**	**19-Dec-2023**	10-Jun-2024	✓	**19-Dec-2023**	10-Jun-2024	✓
EP231C: Perfluoroalkyl Sulfonamides							
HDPE (no PTFE) (EP231X)							
0089_PW346_231213, 0089-SW373_231213, 0089_SW372_231213, 0089_SW371_231213, 0089_PW304_231213, 0089_SW305_231213, 0089_PW368_231213	**13-Dec-2023**	**19-Dec-2023**	10-Jun-2024	✓	**19-Dec-2023**	10-Jun-2024	✓
EP231D: (n:2) Fluorotelomer Sulfonic Acids							
HDPE (no PTFE) (EP231X)							
0089_PW346_231213, 0089-SW373_231213, 0089_SW372_231213, 0089_SW371_231213, 0089_PW304_231213, 0089_SW305_231213, 0089_PW368_231213	**13-Dec-2023**	**19-Dec-2023**	10-Jun-2024	✓	**19-Dec-2023**	10-Jun-2024	✓
EP231P: PFAS Sums							
HDPE (no PTFE) (EP231X)							
0089_PW346_231213, 0089-SW373_231213, 0089_SW372_231213, 0089_SW371_231213, 0089_PW304_231213, 0089_SW305_231213, 0089_PW368_231213	**13-Dec-2023**	**19-Dec-2023**	10-Jun-2024	✓	**19-Dec-2023**	10-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)							
Alkalinity by Auto Titrator	ED037-P	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	17	**11.76**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	4	40	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	17	**11.76**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Alkalinity by Auto Titrator	ED037-P	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	17	**11.76**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	40	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	17	**11.76**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Alkalinity by Auto Titrator	ED037-P	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	1	17	**5.88**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	40	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	17	**5.88**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Chloride by Discrete Analyser	ED045G	1	17	**5.88**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	40	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	17	**5.88**	**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
Alkalinity by Auto Titrator	ED037-P	WATER	In house: Referenced to APHA 2320 B This procedure determines alkalinity by automated measurement (e.g. PC Titrate) on a settled supernatant aliquot of the sample using pH 4.5 for indicating the total alkalinity end-point. This method is compliant with NEPM Schedule B(3)
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	WATER	In house: Referenced to APHA 4500-SO4. Dissolved sulfate is determined in a 0.45um filtered sample. Sulfate ions are converted to a barium sulfate suspension in an acetic acid medium with barium chloride. Light absorbance of the BaSO4 suspension is measured by a photometer and the SO4-2 concentration is determined by comparison of the reading with a standard curve. This method is compliant with NEPM Schedule B(3)
Chloride by Discrete Analyser	ED045G	WATER	In house: Referenced to APHA 4500 Cl - G.The thiocyanate ion is liberated from mercuric thiocyanate through sequestration of mercury by the chloride ion to form non-ionised mercuric chloride. In the presence of ferric ions the liberated thiocynate forms highly-coloured ferric thiocynate which is measured at 480 nm.
Major Cations - Dissolved	ED093F	WATER	In house: Referenced to APHA 3120 and 3125; USEPA SW 846 - 6010 and 6020; Cations are determined by either ICP-AES or ICP-MS techniques. This method is compliant with NEPM Schedule B(3) Sodium Adsorption Ratio is calculated from Ca, Mg and Na which determined by ALS in house method QWI-EN/ED093F. This method is compliant with NEPM Schedule B(3) Hardness parameters are calculated based on APHA 2340 B. This method is compliant with NEPM Schedule B(3)
Ionic Balance by PCT DA and Turbi SO4 DA	* EN055 - PG	WATER	In house: Referenced to APHA 1030F. This method is compliant with NEPM Schedule B(3)
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.

ALSCompass
SAMPLING *Intelligence*

ALS

Environmental Division
Perth
Work Order Reference
EP2317702

Telephone +61-8-9406 1301

Custody Document for Submissions via ALS Compass App

Project: WA_0054_PFASDMP_23 **Client:** Stantec **Project Manage** [redacted]

ALS Compass COC Reference: 61564; 61565; 61534; 61532; 61516; 61523; 61521; 61520; 61533 **# Samples:** 2 Eskies **Phone:**

Turnaround Requirements: Standard ____ Urgent ____ **Sampler:** [redacted] **Phone:** ( )

Special Instructions:

Custody:

Relinquished by: [redacted]	Received by: [redacted]	Relinquished by:	Received by:
Date / Time: 8/12/23	Date / Time: 13/12@1700.	Date / Time:	Date / Time:

CHAIN OF CUSTODY

COC#: 61533 *ALS Laboratory:* EP Perth Environmental

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

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP_23

SITE: Stirling SD - SD

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted] SAMPLER MOBILE [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES 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 Sediments SEDIMENT	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
001	0089_SD346		13/12/2023 08:54 AM	SOIL	ALS: 1 Non ALS: 0	No	X		
002	0089_SD304		13/12/2023 09:43 AM	SOIL	ALS: 1 Non ALS: 0	No	X		
003	0089_SD368		13/12/2023 09:44 AM	SOIL	ALS: 1 Non ALS: 0	No	X		

CHAIN OF CUSTODY

COC#: 61533 *ALS Laboratory:* EP Perth Environmental

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

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP_23

SITE: Stirling SD - SD

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES 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	0089_SD346	HDPE Soil Jar	200 mL	00621122011118	Grey	No	
002	0089_SD304	HDPE Soil Jar	200 mL	00621122011143	Grey	No	
003	0089_SD368	HDPE Soil Jar	200 mL	00621122011121	Grey	No	

Total Bottle Count: ALS: 3, Non ALS: 0

SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : **EP2317702**

Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: Customer Services EP
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
E-mail	: [redacted]stantec.com	E-mail	: ALSEnviro.Perth@alsglobal.com
Telephone	: ----	Telephone	: +61-8-9406 1301
Facsimile	: ----	Facsimile	: +61-8-9406 1399
Project	: WA_0089_PFASOMP_23	Page	: 1 of 2
Order number	: pfas-omp/Stirling	Quote number	: ES2022MWHAUS0002 (SY/139/19 B)
C-O-C number	: 61533	QC Level	: NEPM 2013 B3 & ALS QC Standard
Site	: Stirling SD - SD		
Sampler	: [redacted]		

Dates

Date Samples Received	: 13-Dec-2023 17:00	Issue Date	: 16-Dec-2023
Client Requested Due Date	: 22-Dec-2023	Scheduled Reporting Date	: **22-Dec-2023**

Delivery Details

Mode of Delivery	: Carrier	Security Seal	: Not Available
No. of coolers/boxes	: 2	Temperature	: 6.7 - Ice present
Receipt Detail	:	No. of samples received / analysed	: 3 / 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 see scanned COC for sample discrepencies: extra samples , samples not received etc.
- Please direct any queries related to sample condition / numbering / breakages to Sample Receipt (Samples.Perth@alsglobal.com)
- Analytical work for this work order will be conducted at ALS Environmental Perth.
- Please direct any turnaround / technical queries to the laboratory contact designated above.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months) from receipt of samples.
- **pH analysis should be conducted within 6 hours of sampling.**
- **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.**
- 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: **SOIL**

Laboratory sample ID	Sampling date / time	Sample ID	SOIL - EA055-103 Moisture Content	SOIL - EP231X (solids) PFAS - Full Suite (28 analytes)
EP2317702-001	13-Dec-2023 08:54	0089_SD346_231213	✓	✓
EP2317702-002	13-Dec-2023 09:43	0089_SD304_231213	✓	✓
EP2317702-003	13-Dec-2023 09:44	0089_SD368_231213	✓	✓

Proactive Holding Time Report

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

Requested Deliverables

[redacted]
- A4 - AU Tax Invoice (INV) — Email — [redacted]cardno.com.au

DERP LAB REPORTS
- EDI Format - ESDAT (ESDAT) — Email — derp.labreports@esdat.com.au

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

CERTIFICATE OF ANALYSIS

Work Order	: **EP2317702**	Page	: 1 of 5
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: Customer Services EP
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: +61-8-9406 1301
Project	: WA_0089_PFASOMP_23	Date Samples Received	: 13-Dec-2023 17:00
Order number	: pfas-omp/Stirling	Date Analysis Commenced	: 18-Dec-2023
C-O-C number	: 61533	Issue Date	: 21-Dec-2023 15:59
Sampler	: [redacted] [redacted]		
Site	: Stirling SD - SD		
Quote number	: SY/139/19 B		
No. of samples received	: 3		
No. of samples analysed	: 3		

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]	Laboratory Manager (Perth)	Perth Inorganics, Wangara, WA
[redacted]	Senior Organic Chemist	Perth Organics, Wangara, WA

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.

- 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: SEDIMENT (Matrix: SOIL)			Sample ID	0089_SD346_231213	0089_SD304_231213	0089_SD368_231213	----	----
			Sampling date / time	13-Dec-2023 08:54	13-Dec-2023 09:43	13-Dec-2023 09:44	----	----
Compound	CAS Number	LOR	Unit	EP2317702-001	EP2317702-002	EP2317702-003	--------	--------
				Result	Result	Result	----	----
EA055: Moisture Content (Dried @ 105-110°C)								
Moisture Content	----	0.1	%	**39.7**	**41.8**	**41.3**	----	----
EP231A: Perfluoroalkyl Sulfonic Acids								
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	----	----
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	----	----
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	----	----
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	----	----
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	**0.0040**	<0.0002	<0.0002	----	----
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	----	----
EP231B: Perfluoroalkyl Carboxylic Acids								
Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	<0.001	<0.001	----	----
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	----	----
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	----	----
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	----	----
Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	----	----
Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	----	----
Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	----	----
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	----	----
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	----	----
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	----	----
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	----	----
EP231C: Perfluoroalkyl Sulfonamides								
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	----	----

Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)				Sample ID	0089_SD346_231213	0089_SD304_231213	0089_SD368_231213	----	----
				Sampling date / time	13-Dec-2023 08:54	13-Dec-2023 09:43	13-Dec-2023 09:44	----	----
Compound	CAS Number	LOR	Unit		EP2317702-001	EP2317702-002	EP2317702-003	--------	--------
					Result	Result	Result	----	----
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	----	----
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	----	----
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	----	----
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	----	----
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	----	----
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	----	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	----	----
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	----	----
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	----	----
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	----	----
EP231P: PFAS Sums									
Sum of PFAS	---	0.0002	mg/kg		**0.0040**	<0.0002	<0.0002	----	----
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg		**0.0040**	<0.0002	<0.0002	----	----
Sum of PFAS (WA DER List)	---	0.0002	mg/kg		**0.0040**	<0.0002	<0.0002	----	----
EP231S: PFAS Surrogate									
13C4-PFOS	---	0.0002	%		**94.0**	**92.5**	**96.5**	----	----
13C8-PFOA	---	0.0002	%		**102**	**104**	**101**	----	----

Surrogate Control Limits

Sub-Matrix: **SEDIMENT**		Recovery Limits (%)	
Compound	*CAS Number*	*Low*	*High*
EP231S: PFAS Surrogate			
13C4-PFOS	---	76	136
13C8-PFOA	---	78	131

QUALITY CONTROL REPORT

Work Order	: **EP2317702**	Page	: 1 of 7
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: Customer Services EP
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: +61-8-9406 1301
Project	: WA_0089_PFASOMP_23	Date Samples Received	: 13-Dec-2023
Order number	: pfas-omp/Stirling	Date Analysis Commenced	: 18-Dec-2023
C-O-C number	: 61533	Issue Date	: 21-Dec-2023
Sampler	: [redacted]		
Site	: Stirling SD - SD		
Quote number	: SY/139/19 B		
No. of samples received	: 3		
No. of samples analysed	: 3		

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]	Laboratory Manager (Perth)	Perth Inorganics, Wangara, WA
[redacted]	Senior Organic Chemist	Perth Organics, Wangara, WA

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: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
EA055: Moisture Content (Dried @ 105-110°C) (QC Lot: 5499343)									
EP2317691-001	Anonymous	EA055: Moisture Content	----	0.1	%	28.5	27.9	2.2	0% - 20%
EP2317763-001	Anonymous	EA055: Moisture Content	----	0.1 (1.0)*	%	2.5	2.6	4.6	No Limit
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 5500708)									
EP2317564-045	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
EP2317691-002	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	0.0003	0.0003	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 5500708)									
EP2317564-045	Anonymous	EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit

Sub-Matrix: **SOIL**

				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: 5500708) - continued									
EP2317564-045	Anonymous	EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	<0.001	0.0	No Limit
EP2317691-002	Anonymous	EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	<0.001	0.0	No Limit
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 5500708)									
EP2317564-045	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448 09 7	0 0005	mg/kg	0 0005	0 0005	0 0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
EP2317691-002	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991 50 6	0 0002	mg/kg	0 0002	0 0002	0 0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit

Sub-Matrix: **SOIL**

				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: 5500708) - continued									
EP2317691-002	Anonymous	EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 5500708)									
EP2317564-045	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
EP2317691-002	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
EP231P: PFAS Sums (QC Lot: 5500708)									
EP2317564-045	Anonymous	EP231X: Sum of PFAS	----	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Sum of PFAS (WA DER List)	----	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
EP2317691-002	Anonymous	EP231X: Sum of PFAS	----	0.0002	mg/kg	0.0003	0.0003	0.0	No Limit
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg	0.0003	0.0003	0.0	No Limit
		EP231X: Sum of PFAS (WA DER List)	----	0.0002	mg/kg	0.0003	0.0003	0.0	No Limit

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: **SOIL**

				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: 5500708)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	0.0011 mg/kg	101	72.0	128
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	0.00125 mg/kg	99.2	73.0	123
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	0.00118 mg/kg	92.8	67.0	130
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	0.00119 mg/kg	103	70.0	132
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	0.00116 mg/kg	102	68.0	136
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	0.0012 mg/kg	102	59.0	134
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5500708)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	0.00625 mg/kg	84.6	71.0	135
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	0.00125 mg/kg	98.4	69.0	132
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	0.00125 mg/kg	96.4	70.0	132
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	0.00125 mg/kg	95.2	71.0	131
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	110	69.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	96.8	72.0	129
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	0.00125 mg/kg	103	69.0	133
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	109	64.0	136
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	99.2	69.0	135
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	106	66.0	139
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	0.00125 mg/kg	114	69.0	133
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5500708)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	0.00125 mg/kg	98.4	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	0.00312 mg/kg	114	59.6	143
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	0.00312 mg/kg	86.0	62.8	140
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	0.00312 mg/kg	105	61.5	139
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	0.00312 mg/kg	94.2	61.9	139
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	0.00125 mg/kg	100	63.0	144
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	0.00125 mg/kg	108	61.0	139
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5500708)								

Sub-Matrix: **SOIL**

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: 5500708) - continued								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	0.00117 mg/kg	100	62.0	145
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	0.00118 mg/kg	97.9	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	0.0012 mg/kg	92.1	65.0	137
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	0.0012 mg/kg	93.8	54.8	124
EP231P: PFAS Sums (QCLot: 5500708)								
EP231X: Sum of PFAS	---	0.0002	mg/kg	<0.0002	---	---	---	---
EP231X: Sum of PFHxS and PFOS	355-46-4/17 63-23-1	0.0002	mg/kg	<0.0002	---	---	---	---
EP231X: Sum of PFAS (WA DER List)	---	0.0002	mg/kg	<0.0002	---	---	---	---

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: **SOIL**

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: 5500708)							
EP2317564-046	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0011 mg/kg	111	72.0	128
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.00117 mg/kg	120	73.0	123
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.00118 mg/kg	91.0	67.0	130
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.00119 mg/kg	95.0	70.0	132
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.00116 mg/kg	95.6	68.0	136
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0012 mg/kg	95.0	59.0	134
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5500708)							
EP2317564-046	Anonymous	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.00625 mg/kg	89.7	71.0	135
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.00125 mg/kg	91.7	69.0	132
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.00125 mg/kg	116	70.0	132
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.00125 mg/kg	86.5	71.0	131
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.00125 mg/kg	95.9	69.0	133
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.00125 mg/kg	95.2	72.0	129
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.00125 mg/kg	84.4	69.0	133
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.00125 mg/kg	98.0	64.0	136
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.00125 mg/kg	97.2	69.0	135
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.00125 mg/kg	110	66.0	139
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.00125 mg/kg	116	69.0	133
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5500708)							

Sub-Matrix: **SOIL**

				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: 5500708) - continued							
EP2317564-046	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.00125 mg/kg	108	48.0	128
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.00312 mg/kg	115	60.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.00312 mg/kg	80.1	60.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.00312 mg/kg	106	60.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.00312 mg/kg	103	60.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.00125 mg/kg	93.2	63.0	144
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.00125 mg/kg	109	61.0	139
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5500708)							
EP2317564-046	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.00117 mg/kg	110	62.0	145
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.00118 mg/kg	97.7	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0012 mg/kg	88.3	65.0	137
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0012 mg/kg	94.6	60.0	130

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **EP2317702**	Page	: 1 of 4
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Telephone	: +61-8-9406 1301
Project	: WA_0089_PFASOMP_23	Date Samples Received	: 13-Dec-2023
Site	: Stirling SD - SD	Issue Date	: 21-Dec-2023
Sampler	: [redacted]	No. of samples received	: 3
Order number	: pfas-omp/Stirling	No. of samples analysed	: 3

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: **SOIL**

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
EA055: Moisture Content (Dried @ 105-110°C)								
HDPE Soil Jar (EA055)								
0089_SD346_231213,	0089_SD304_231213,	**13-Dec-2023**	**----**	----	----	**18-Dec-2023**	27-Dec-2023	✓
0089_SD368_231213								
EP231A: Perfluoroalkyl Sulfonic Acids								
HDPE Soil Jar (EP231X)								
0089_SD346_231213,	0089_SD304_231213,	**13-Dec-2023**	**19-Dec-2023**	10-Jun-2024	✓	**20-Dec-2023**	28-Jan-2024	✓
0089_SD368_231213								
EP231B: Perfluoroalkyl Carboxylic Acids								
HDPE Soil Jar (EP231X)								
0089_SD346_231213,	0089_SD304_231213,	**13-Dec-2023**	**19-Dec-2023**	10-Jun-2024	✓	**20-Dec-2023**	28-Jan-2024	✓
0089_SD368_231213								
EP231C: Perfluoroalkyl Sulfonamides								
HDPE Soil Jar (EP231X)								
0089_SD346_231213,	0089_SD304_231213,	**13-Dec-2023**	**19-Dec-2023**	10-Jun-2024	✓	**20-Dec-2023**	28-Jan-2024	✓
0089_SD368_231213								
EP231D: (n:2) Fluorotelomer Sulfonic Acids								
HDPE Soil Jar (EP231X)								
0089_SD346_231213,	0089_SD304_231213,	**13-Dec-2023**	**19-Dec-2023**	10-Jun-2024	✓	**20-Dec-2023**	28-Jan-2024	✓
0089_SD368_231213								
EP231P: PFAS Sums								
HDPE Soil Jar (EP231X)								
0089_SD346_231213,	0089_SD304_231213,	**13-Dec-2023**	**19-Dec-2023**	10-Jun-2024	✓	**20-Dec-2023**	28-Jan-2024	✓
0089_SD368_231213								

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: **SOIL**

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)							
Moisture Content	EA055	2	11	**18.18**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	20	**5.00**	**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
Moisture Content	EA055	SOIL	In house: A gravimetric procedure based on weight loss over a 12 hour drying period at 105-110 degrees C. This method is compliant with NEPM Schedule B(3).
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	SOIL	In-house: Analysis of soils by solvent extraction followed by LC-Electrospray-MS-MS, Negative Mode using MRM using internal standard quantitation. Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to a portion of soil which is then extracted with MTBE and an ion pairing reagent. A portion of extract is exchanged into the analytical solvent mixture, combined with an equal volume reagent water and 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
QuECheRS Extraction of Solids	* ORG71	SOIL	In house: Sequential extractions with Acetonitrile/Methanol by shaking. Extraction efficiency aided by the addition of salts under acidic conditions. Where relevant, interferences from co-extracted organics are removed with dispersive clean-up media (dSPE). The extract is either diluted or concentrated and exchanged into the analytical solvent.

ALSCompass
SAMPLING *Intelligence*

ALS

Environmental Division
Perth
Work Order Reference
EP2317729

Telephone : 61-8-9406 1301

Custody Document for Submissions via ALS Compass App

Project: WA_0089_PFASOMP_23 **Client:** Stantec **Project Manager:** [redacted]

ALS Compass COC Reference: 61564; 61565; 61534; 61532; 61516; 61523; 61521; 61520; 61533 **# Samples:** 2 Eskies **Phone:**

Sampler: [redacted]

Turnaround Requirements: Standard _____ Urgent _____ **Phone:**

Special Instructions:

Custody:

Relinquished by:	Received by:	Relinquished by:	Received by:
[redacted]	[redacted]		
Date / Time: 8/12/23	Date / Time: 13/12@1700.	Date / Time:	Date / Time:

CHAIN OF CUSTODY

COC#: 61523 ALS Laboratory: EP Perth Environmental

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

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP_23

SITE: Stirling GW - MB

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES 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	Rinsate WATER	WA OMP Water Suite WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
001	0089_MW200		13/12/2023 09:52 AM	WATER	ALS: 3 Non ALS: 0	No		X		
002	0089_MW195D		13/12/2023 10:41 AM	WATER	ALS: 5 Non ALS: 0	No		X		Extra pfas bottles for lab qc
003	0089_MW173		13/12/2023 10:56 AM	WATER	ALS: 3 Non ALS: 0	No		X		
004	0089_MW193		13/12/2023 11:16 AM	WATER	ALS: 3 Non ALS: 0	No		X		
005	0089_QC301			WATER	ALS: 0 Non ALS: 0	No	X			
006	0089_QC302		13/12/2023 12:32 PM	WATER	ALS: 0 Non ALS: 0	No	X			
007	0089_QC303			WATER	ALS: 0 Non ALS: 0	No	X			

CHAIN OF CUSTODY

COC#: **61523** *ALS Laboratory:* EP Perth Environmental

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

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP_23

SITE: Stirling GW - MB

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES 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	Rinsate WATER	WA OMP Water Suite WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
008	0089_QC401			WATER	ALS: 0 Non ALS: 0	No		X		
009	0089_QC402			WATER	ALS: 0 Non ALS: 0	No		X		
010	0089_QC403		13/12/2023 12:33 PM	WATER	ALS: 0 Non ALS: 0	No		X		

CHAIN OF CUSTODY

COC#: 61523 *ALS Laboratory:* EP Perth Environmental

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

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP_23

SITE: Stirling GW - MB

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES 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	0089_MW200	Clear Plastic Bottle - Natural	125 mL	00070522229656	Green	No	
001	0089_MW200	HDPE (no PTFE)	20 mL	00352309068094	Grey	No	
001	0089_MW200	HDPE (no PTFE)	20 mL	00352309068108	Grey	No	
002	0089_MW195D	HDPE (no PTFE)	20 mL	00351221006254	Grey	No	
002	0089_MW195D	HDPE (no PTFE)	20 mL	00351221005949	Grey	No	
002	0089_MW195D	HDPE (no PTFE)	20 mL	00352309067911	Grey	No	
002	0089_MW195D	HDPE (no PTFE)	20 mL	00352309068288	Grey	No	
002	0089_MW195D	Clear Plastic Bottle - Natural	125 mL	00070522229696	Green	No	
003	0089_MW173	Clear Plastic Bottle - Natural	125 mL	00070522229841	Green	No	
003	0089_MW173	HDPE (no PTFE)	20 mL	00352309068143	Grey	No	
003	0089_MW173	HDPE (no PTFE)	20 mL	00352309068111	Grey	No	
004	0089_MW193	HDPE (no PTFE)	20 mL	00352309068186	Grey	No	
004	0089_MW193	HDPE (no PTFE)	20 mL	00352309068129	Grey	No	
004	0089_MW193	Clear Plastic Bottle - Natural	125 mL	00070522229609	Green	No	

Total Bottle Count: ALS: 14, Non ALS: 0

SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : **EP2317729**

Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: Customer Services EP
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
E-mail	: [redacted]stantec.com	E-mail	: ALSEnviro.Perth@alsglobal.com
Telephone	: ----	Telephone	: +61-8-9406 1301
Facsimile	: ----	Facsimile	: +61-8-9406 1399
Project	: WA_0089_PFASOMP_23	Page	: 1 of 2
Order number	: pfas-omp/Stirling	Quote number	: ES2022MWHAUS0002 (SY/139/19 B)
C-O-C number	: 61523	QC Level	: NEPM 2013 B3 & ALS QC Standard
Site	: Stirling GW - MB		
Sampler	: [redacted]		

Dates

Date Samples Received	: 13-Dec-2023 17:00	Issue Date	: 18-Dec-2023
Client Requested Due Date	: 22-Dec-2023	Scheduled Reporting Date	: **22-Dec-2023**

Delivery Details

Mode of Delivery	: Carrier	Security Seal	: Not Available
No. of coolers/boxes	: 2	Temperature	: 6.7 - Ice present
Receipt Detail	:	No. of samples received / analysed	: 10 / 10

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 see scanned COC for sample discrepencies: extra samples , samples not received etc.
- Please direct any queries related to sample condition / numbering / breakages to Sample Receipt (Samples.Perth@alsglobal.com)
- Analytical work for this work order will be conducted at ALS Environmental Perth.
- Please direct any turnaround / technical queries to the laboratory contact designated above.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months) from receipt of samples.
- **pH analysis should be conducted within 6 hours of sampling.**
- **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.**
- 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)	WATER - NT-01 & 02 Ca, Mg, Na, K, Cl, SO4, Alkalinity
EP2317729-001	13-Dec-2023 09:52	0089_MW200_231213	✓	✓
EP2317729-002	13-Dec-2023 10:41	0089_MW195D_231213	✓	✓
EP2317729-003	13-Dec-2023 10:56	0089_MW173_231213	✓	✓
EP2317729-004	13-Dec-2023 11:16	0089_MW193_231213	✓	✓
EP2317729-005	13-Dec-2023 12:31	0089_QC301_231213	✓	
EP2317729-006	13-Dec-2023 12:32	0089_QC302_231213	✓	
EP2317729-007	13-Dec-2023 12:32	0089_QC303_231213	✓	
EP2317729-008	13-Dec-2023 12:33	0089_QC401_231213	✓	
EP2317729-009	13-Dec-2023 12:33	0089_QC402_231213	✓	
EP2317729-010	13-Dec-2023 12:33	0089_QC403_231213	✓	

Proactive Holding Time Report

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

Requested Deliverables

[redacted]
- A4 - AU Tax Invoice (INV) — Email — [redacted]cardno.com.au

DERP LAB REPORTS
- EDI Format - ESDAT (ESDAT) — Email — derp.labreports@esdat.com.au

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

CERTIFICATE OF ANALYSIS

Work Order	: **EP2317729**	Page	: 1 of 8
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: Customer Services EP
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: +61-8-9406 1301
Project	: WA_0089_PFASOMP_23	Date Samples Received	: 13-Dec-2023 17:00
Order number	: pfas-omp/Stirling	Date Analysis Commenced	: 19-Dec-2023
C-O-C number	: 61523	Issue Date	: 22-Dec-2023 14:18
Sampler	: [redacted]		
Site	: Stirling GW - MB		
Quote number	: SY/139/19 B		
No. of samples received	: 10		
No. of samples analysed	: 10		

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]	Inorganics Supervisor	Perth Inorganics, Wangara, WA
[redacted]	Senior Organic Chemist	Perth Organics, Wangara, WA

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.
- As per QWI – EN55-3 Data Interpreting Procedures, Ionic balances are typically calculated using Major Anions - Chloride, Alkalinity and Sulfate; and Major Cations - Calcium, Magnesium, Potassium and Sodium. Where applicable and dependent upon sample matrix, the Ionic Balance may also include the additional contribution of Ammonia, Dissolved Metals by ICPMS and H+ to the Cations and Nitrate, SiO2 and Fluoride to the Anions.
- Sodium Adsorption Ratio (where reported): Where results for Na, Ca or Mg are <LOR, a concentration at half the reported LOR is incorporated into the SAR calculation. This represents a conservative approach for Na relative to the assumption that <LOR = zero concentration and a conservative approach for Ca & Mg relative to the assumption that <LOR is equivalent to the LOR concentration.
- 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.
- ED045G: The presence of Thiocyanate, Thiosulfate and Sulfite can positively contribute to the chloride result, thereby may bias results higher than expected. Results should be scrutinised accordingly.

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW200_231213	0089_MW195D_231213	0089_MW173_231213	0089_MW193_231213	0089_QC301_231213
				Sampling date / time	13-Dec-2023 09:52	13-Dec-2023 10:41	13-Dec-2023 10:56	13-Dec-2023 11:16	13-Dec-2023 12:31
Compound	CAS Number	LOR	Unit		EP2317729-001	EP2317729-002	EP2317729-003	EP2317729-004	EP2317729-005
					Result	Result	Result	Result	Result
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	<1	<1	<1	----
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	<1	<1	<1	----
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		441	371	481	677	----
Total Alkalinity as CaCO3	----	1	mg/L		441	371	481	677	----
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		204	1220	96	180	----
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		1940	7120	593	478	----
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		81	316	147	126	----
Magnesium	7439-95-4	1	mg/L		101	606	86	85	----
Sodium	7440-23-5	1	mg/L		1260	4270	316	301	----
Potassium	7440-09-7	1	mg/L		70	214	22	14	----
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		67.8	234	28.3	30.8	----
ø Total Cations	----	0.01	meq/L		69.0	257	28.7	26.7	----
ø Ionic Balance	----	0.01	%		0.85	4.73	0.67	7.00	----
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		<0.02	<0.02	0.11	0.39	<0.02
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		<0.02	<0.02	0.08	0.64	<0.02
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		<0.01	<0.01	1.35	5.19	<0.01
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		<0.02	<0.02	0.25	0.32	<0.02
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		<0.01	<0.01	2.40	1.49	<0.01
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW200_231213	0089_MW195D_231213	0089_MW173_231213	0089_MW193_231213	0089_QC301_231213
				Sampling date / time	13-Dec-2023 09:52	13-Dec-2023 10:41	13-Dec-2023 10:56	13-Dec-2023 11:16	13-Dec-2023 12:31
Compound	CAS Number	LOR	Unit		EP2317729-001	EP2317729-002	EP2317729-003	EP2317729-004	EP2317729-005
					Result	Result	Result	Result	Result
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	**0.05**	**0.16**	<0.02
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		<0.02	<0.02	**0.19**	**0.91**	<0.02
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		<0.02	<0.02	**0.03**	**0.11**	<0.02
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		<0.01	<0.01	**0.16**	**0.35**	<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
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									

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW200_231213	0089_MW195D_231213	0089_MW173_231213	0089_MW193_231213	0089_QC301_231213
				Sampling date / time	13-Dec-2023 09:52	13-Dec-2023 10:41	13-Dec-2023 10:56	13-Dec-2023 11:16	13-Dec-2023 12:31
Compound	CAS Number	LOR	Unit		EP2317729-001	EP2317729-002	EP2317729-003	EP2317729-004	EP2317729-005
					Result	Result	Result	Result	Result
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
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	**4.62**	**9.66**	<0.01
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		<0.01	<0.01	**3.75**	**6.68**	<0.01
Sum of PFAS (WA DER List)	---	0.01	µg/L		<0.01	<0.01	**4.29**	**8.70**	<0.01
EP231S: PFAS Surrogate									
13C4-PFOS	---	0.02	%		**91.0**	**100**	**96.7**	**97.6**	**101**
13C8-PFOA	---	0.02	%		**95.9**	**99.9**	**106**	**104**	**102**

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_QC302_231213	0089_QC303_231213	0089_QC401_231213	0089_QC402_231213	0089_QC403_231213
				Sampling date / time	13-Dec-2023 12:32	13-Dec-2023 12:32	13-Dec-2023 12:33	13-Dec-2023 12:33	13-Dec-2023 12:33
Compound	CAS Number	LOR	Unit		EP2317729-006	EP2317729-007	EP2317729-008	EP2317729-009	EP2317729-010
					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	<0.01
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: GROUNDWATER (Matrix: WATER)				Sample ID	0089_QC302_231213	0089_QC303_231213	0089_QC401_231213	0089_QC402_231213	0089_QC403_231213
				Sampling date / time	13-Dec-2023 12:32	13-Dec-2023 12:32	13-Dec-2023 12:33	13-Dec-2023 12:33	13-Dec-2023 12:33
Compound	CAS Number	LOR	Unit		EP2317729-006	EP2317729-007	EP2317729-008	EP2317729-009	EP2317729-010
					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	<0.01	<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	%		**99.9**	**106**	**101**	**99.9**	**101**
13C8-PFOA	---	0.02	%		**102**	**105**	**100**	**104**	**104**

Surrogate Control Limits

Sub-Matrix: GROUNDWATER		Recovery Limits (%)	
Compound	CAS Number	Low	High
EP231S: PFAS Surrogate			
13C4-PFOS	---	65	140
13C8-PFOA	---	71	133

QUALITY CONTROL REPORT

Work Order	: **EP2317729**	Page	: 1 of 13
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: Customer Services EP
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: +61-8-9406 1301
Project	: WA_0089_PFASOMP_23	Date Samples Received	: 13-Dec-2023
Order number	: pfas-omp/Stirling	Date Analysis Commenced	: 19-Dec-2023
C-O-C number	: 61523	Issue Date	: 22-Dec-2023
Sampler	: [redacted]		
Site	: Stirling GW - MB		
Quote number	: SY/139/19 B		
No. of samples received	: 10		
No. of samples analysed	: 10		

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]	Inorganics Supervisor	Perth Inorganics, Wangara, WA
[redacted]	Senior Organic Chemist	Perth Organics, Wangara, WA

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 (%)
ED037P: Alkalinity by PC Titrator (QC Lot: 5505346)									
EP2317690-003	Anonymous	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	122	138	12.3	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	122	138	12.3	0% - 20%
EP2317701-007	Anonymous	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	441	441	0.0	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	441	441	0.0	0% - 20%
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QC Lot: 5501011)									
EP2317729-001	0089_MW200_231213	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	204	195	4.2	0% - 20%
EP2317756-007	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	2620	2630	0.4	0% - 20%
ED045G: Chloride by Discrete Analyser (QC Lot: 5501012)									
EP2317729-001	0089_MW200_231213	ED045G: Chloride	16887-00-6	1	mg/L	1940	1900	2.3	0% - 20%
EP2317756-007	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	17900	17900	0.3	0% - 20%
ED093F: Dissolved Major Cations (QC Lot: 5500583)									
EP2317690-004	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	682	635	7.2	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	1840	1720	7.0	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	14600	13500	7.3	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	734	678	7.9	0% - 20%
EP2317850-002	Anonymous	ED093F Calcium	7440-70-2	1	mg/L	481	460	4.4	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	1460	1450	0.6	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	11600	11400	1.2	0% - 20%

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 (%)
ED093F: Dissolved Major Cations (QC Lot: 5500583) - continued									
EP2317850-002	Anonymous	ED093F: Potassium	7440-09-7	1	mg/L	570	565	0.9	0% - 20%
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 5503827)									
EP2317700 011	Anonymous	EP231X: Perfluorohexane sulfonic acid (PFHxS)	355 46 4	0 01	µg/L	0 05	0 04	0 0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	0.12	0.11	11.1	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
EP2317849-002	Anonymous	EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	28.8	32.1	10.7	0% - 20%
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	62.8	69.7	10.4	0% - 20%
		EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	1.29	1.24	3.6	0% - 20%
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	5.68	6.29	10.2	0% - 20%
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	4.98	5.47	9.5	0% - 20%
		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: 5503834)									
EP2317690-003	Anonymous	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
EP2317729-002	0089_MW195D_231213	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
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 5503827)									
EP2317700-011	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

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: 5503827) - continued									
EP2317700-011	Anonymous	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
EP2317849-002	Anonymous	EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	4.14	4.17	0.9	0% - 20%
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	0.75	0.77	2.4	0% - 20%
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	6.23	6.27	0.6	0% - 20%
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	1.98	1.87	5.7	0% - 20%
		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	0.6	0.6	0.0	No Limit
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 5503834)									
EP2317690-003	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
EP2317729-002	0089_MW195D_231213	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: 5503827)									

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: 5503827) - continued									
EP2317700-011	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
EP2317849-002	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
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 5503834)									
EP2317690-003	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
EP2317729-002	0089_MW195D_231213	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	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: 5503834) - continued									
EP2317729-002	0089_MW195D_231213	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: 5503827)									
EP2317700-011	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
EP2317849-002	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
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 5503834)									
EP2317690-003	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
EP2317729-002	0089_MW195D_231213	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 sample ID	Sample ID	Method: Compound	CAS Number	Laboratory Duplicate (DUP) Report					
				LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 5503834) - continued									
EP2317729-002	0089_MW195D_231213	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: 5503827)									
EP2317700-011	Anonymous	EP231X: Sum of PFAS	---	0.01	µg/L	0.17	0.15	12.5	0% - 50%
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	0.17	0.15	12.5	0% - 50%
		EP231X: Sum of PFAS (WA DER List)	---	0.01	µg/L	0.17	0.15	12.5	0% - 50%
EP2317849-002	Anonymous	EP231X: Sum of PFAS	---	0.01	µg/L	117	128	9.1	0% - 20%
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	91.6	102	10.5	0% - 20%
		EP231X: Sum of PFAS (WA DER List)	---	0.01	µg/L	106	117	9.1	0% - 20%
EP231P: PFAS Sums (QC Lot: 5503834)									
EP2317690-003	Anonymous	EP231X: Sum of PFAS	---	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Sum of PFAS (WA DER List)	---	0.01	µg/L	<0.01	<0.01	0.0	No Limit
EP2317729-002	0089_MW195D_231213	EP231X: Sum of PFAS	---	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Sum of PFAS (WA DER List)	---	0.01	µg/L	<0.01	<0.01	0.0	No Limit

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
ED037P: Alkalinity by PC Titrator (QCLot: 5505346)								
ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	---	---	---	---
ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	---	---	---	---
ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	<1	---	---	---	---
ED037-P: Total Alkalinity as CaCO3	---	1	mg/L	<1	20 mg/L	112	85.1	126
				<1	200 mg/L	102	90.5	111
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 5501011)								
ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<1	25 mg/L	96.9	89.9	112
				<1	500 mg/L	100.0	89.9	112
ED045G: Chloride by Discrete Analyser (QCLot: 5501012)								
ED045G: Chloride	16887-00-6	1	mg/L	<1	10 mg/L	100	88.6	113
				<1	1000 mg/L	101	88.6	113
ED093F: Dissolved Major Cations (QCLot: 5500583)								
ED093F: Calcium	7440-70-2	1	mg/L	<1	50 mg/L	102	86.5	117
ED093F: Magnesium	7439-95-4	1	mg/L	<1	50 mg/L	102	88.4	110
ED093F: Sodium	7440-23-5	1	mg/L	<1	50 mg/L	106	91.4	113
ED093F: Potassium	7440-09-7	1	mg/L	<1	50 mg/L	99.5	84.6	108
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5503827)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.2218 µg/L	98.7	72.0	130
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.2352 µg/L	117	71.0	127
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	0.2373 µg/L	98.0	68.0	131
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.238 µg/L	105	69.0	134
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.232 µg/L	92.2	65.0	140
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.241 µg/L	89.4	53.0	142
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5503834)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.2218 µg/L	92.9	72.0	130
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.2352 µg/L	106	71.0	127
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	0.2373 µg/L	87.0	68.0	131
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.238 µg/L	101	69.0	134
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.232 µg/L	93.8	65.0	140
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.241 µg/L	92.5	53.0	142

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: 5503827)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	1.25 µg/L	105	73.0	129
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	0.25 µg/L	88.6	72.0	129
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	0.25 µg/L	112	72.0	129
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	0.25 µg/L	103	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	109	69.0	130
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	0.25 µg/L	87.0	71.0	129
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	0.25 µg/L	97.0	69.0	133
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	0.25 µg/L	93.0	72.0	134
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	0.25 µg/L	88.2	65.0	144
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	0.25 µg/L	102	71.0	132
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5503834)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	1.25 µg/L	87.8	73.0	129
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	0.25 µg/L	93.6	72.0	129
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	0.25 µg/L	87.4	72.0	129
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	0.25 µg/L	92.8	72.0	130
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	0.25 µg/L	93.2	71.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	0.25 µg/L	101	69.0	130
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	0.25 µg/L	87.4	71.0	129
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	0.25 µg/L	95.2	69.0	133
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	0.25 µg/L	86.6	72.0	134
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	0.25 µg/L	77.4	65.0	144
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	0.25 µg/L	82.4	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5503827)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.25 µg/L	74.8	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	0.625 µg/L	108	68.0	141
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	0.625 µg/L	90.2	60.5	138
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	0.625 µg/L	103	68.3	134
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	0.625 µg/L	96.1	62.2	138
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	0.25 µg/L	91.2	65.0	136
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	0.25 µg/L	122	61.0	135

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: 5503834)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.25 µg/L	89.8	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	0.625 µg/L	122	68.0	141
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	0.625 µg/L	81.2	60.5	138
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	0.625 µg/L	90.8	68.3	134
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	0.625 µg/L	113	62.2	138
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	0.25 µg/L	101	65.0	136
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	0.25 µg/L	88.6	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5503827)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.2343 µg/L	116	63.0	143
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	0.2378 µg/L	107	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	0.24 µg/L	115	67.0	138
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	0.241 µg/L	96.3	64.2	133
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5503834)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.2343 µg/L	106	63.0	143
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	0.2378 µg/L	97.4	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	0.24 µg/L	97.1	67.0	138
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	0.241 µg/L	92.3	64.2	133
EP231P: PFAS Sums (QCLot: 5503827)								
EP231X: Sum of PFAS	---	0.01	µg/L	<0.01	---	---	---	---
EP231X: Sum of PFHxS and PFOS	355-46-4/17 63-23-1	0.01	µg/L	<0.01	---	---	---	---
EP231X: Sum of PFAS (WA DER List)	---	0.01	µg/L	<0.01	---	---	---	---
EP231P: PFAS Sums (QCLot: 5503834)								
EP231X: Sum of PFAS	---	0.01	µg/L	<0.01	---	---	---	---
EP231X: Sum of PFHxS and PFOS	355-46-4/17 63-23-1	0.01	µg/L	<0.01	---	---	---	---
EP231X: Sum of PFAS (WA DER List)	---	0.01	µg/L	<0.01	---	---	---	---

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**

Matrix Spike (MS) Report

Sub-Matrix: **WATER**

Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report: Spike Concentration	Matrix Spike (MS) Report: SpikeRecovery(%) MS	Matrix Spike (MS) Report: Acceptable Limits (%) Low	Matrix Spike (MS) Report: Acceptable Limits (%) High
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 5501011)							
EP2317729-001	0089_MW200_231213	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	100 mg/L	114	70.4	130
ED045G: Chloride by Discrete Analyser (QCLot: 5501012)							
EP2317729-001	0089_MW200_231213	ED045G: Chloride	16887-00-6	200 mg/L	# Not Determined	70.0	130
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5503827)							
EP2317849-001	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.2218 µg/L	97.3	72.0	129
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.232 µg/L	122	71.0	127
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.2352 µg/L	109	68.0	129
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.238 µg/L	110	69.0	134
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.232 µg/L	92.1	65.0	140
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.241 µg/L	91.3	53.0	129
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5503834)							
EP2317700-008	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.2218 µg/L	102	72.0	129
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.232 µg/L	126	71.0	127
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.2352 µg/L	85.3	68.0	129
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.238 µg/L	103	69.0	134
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.232 µg/L	98.8	65.0	140
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.241 µg/L	90.0	53.0	129
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5503827)							
EP2317849-001	Anonymous	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	1.25 µg/L	102	73.0	142
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.25 µg/L	104	72.0	129
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.25 µg/L	111	72.0	129
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.25 µg/L	108	72.0	130
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.25 µg/L	114	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	92.0	71.0	134
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.25 µg/L	103	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	118	65.0	144
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.25 µg/L	115	71.0	132
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5503834)							
EP2317700-008	Anonymous	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	1.25 µg/L	85.4	73.0	142
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.25 µg/L	89.4	72.0	129
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.25 µg/L	85.7	72.0	129
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.25 µg/L	88.8	72.0	130
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.25 µg/L	84.4	71.0	133
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.25 µg/L	98.4	69.0	130
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.25 µg/L	81.1	71.0	134

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: 5503834) - continued							
EP2317700-008	Anonymous	EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.25 µg/L	91.4	69.0	133
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.25 µg/L	93.0	72.0	134
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.25 µg/L	77.6	65.0	144
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.25 µg/L	91.2	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5503827)							
EP2317849-001	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.25 µg/L	75.2	59.0	135
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.625 µg/L	124	70.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.625 µg/L	93.4	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.625 µg/L	89.8	70.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.625 µg/L	105	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.25 µg/L	87.4	65.0	136
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.25 µg/L	114	61.0	135
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5503834)							
EP2317700-008	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.25 µg/L	92.4	59.0	135
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.625 µg/L	121	70.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.625 µg/L	77.6	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.625 µg/L	87.7	70.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.625 µg/L	92.4	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.25 µg/L	99.4	65.0	136
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.25 µg/L	91.8	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5503827)							
EP2317849-001	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.234 µg/L	114	63.0	143
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.2378 µg/L	111	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.24 µg/L	106	67.0	138
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.2415 µg/L	90.2	70.0	130
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5503834)							
EP2317700-008	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.234 µg/L	104	63.0	143
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.2378 µg/L	97.2	64.0	140

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: 5503834) - continued							
EP2317700-008	Anonymous	EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.24 µg/L	101	67.0	138
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.2415 µg/L	86.3	70.0	130

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **EP2317729**	Page	: 1 of 5
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Telephone	: +61-8-9406 1301
Project	: WA_0089_PFASOMP_23	Date Samples Received	: 13-Dec-2023
Site	: Stirling GW - MB	Issue Date	: 22-Dec-2023
Sampler	: [redacted]	No. of samples received	: 10
Order number	: pfas-omp/Stirling	No. of samples analysed	: 10

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.**
- **Matrix Spike outliers exist - please see following pages for full details.**
- **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.**

Outliers : Quality Control Samples

Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

Matrix: **WATER**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
Matrix Spike (MS) Recoveries							
ED045G: Chloride by Discrete Analyser	EP2317729--001	0089_MW200_231213	**Chloride**	16887-00-6	Not Determined	---	**MS recovery not determined, background level greater than or equal to 4x spike level.**

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*
ED037P: Alkalinity by PC Titrator								
Clear Plastic Bottle - Natural (ED037-P)								
0089_MW200_231213,	0089_MW195D_231213,	**13-Dec-2023**	---	---	---	**20-Dec-2023**	27-Dec-2023	✓
0089_MW173_231213,	0089_MW193_231213							
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA								
Clear Plastic Bottle - Natural (ED041G)								
0089_MW200_231213,	0089_MW195D_231213,	**13-Dec-2023**	---			**22-Dec-2023**	10 Jan 2024	✓
0089_MW173_231213,	0089_MW193_231213							
ED045G: Chloride by Discrete Analyser								
Clear Plastic Bottle - Natural (ED045G)								
0089 MW200 231213,	0089 MW195D 231213,	**13-Dec-2023**	---	---	---	**22-Dec-2023**	10-Jan-2024	✓
0089 MW173 231213,	0089 MW193 231213							
ED093F: Dissolved Major Cations								
Clear Plastic Bottle - Natural (ED093F)								
0089_MW200_231213,	0089_MW195D_231213,	**13-Dec-2023**	---	---	---	**20-Dec-2023**	20-Dec-2023	✓
0089_MW173_231213,	0089_MW193_231213							
EP231A: Perfluoroalkyl Sulfonic Acids								
HDPE (no PTFE) (EP231X)								
0089_MW200_231213,	0089_MW195D_231213,	**13-Dec-2023**	**19-Dec-2023**	10-Jun-2024	✓	**19-Dec-2023**	10-Jun-2024	✓
0089_MW173_231213,	0089_MW193_231213,							
0089_QC301_231213,	0089_QC302_231213,							
0089_QC303_231213,	0089_QC401_231213,							
0089_QC402_231213,	0089_QC403_231213							

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)								
0089_MW200_231213,	0089_MW195D_231213,	**13-Dec-2023**	**19-Dec-2023**	10-Jun-2024	✓	**19-Dec-2023**	10-Jun-2024	✓
0089_MW173_231213,	0089_MW193_231213,							
0089_QC301_231213,	0089_QC302_231213,							
0089_QC303_231213,	0089_QC401_231213,							
0089_QC402_231213,	0089_QC403_231213							
EP231C: Perfluoroalkyl Sulfonamides								
HDPE (no PTFE) (EP231X)								
0089_MW200_231213,	0089_MW195D_231213,	**13-Dec-2023**	**19-Dec-2023**	10-Jun-2024	✓	**19-Dec-2023**	10-Jun-2024	✓
0089_MW173_231213,	0089_MW193_231213,							
0089_QC301_231213,	0089_QC302_231213,							
0089_QC303_231213,	0089_QC401_231213,							
0089_QC402_231213,	0089_QC403_231213							
EP231D: (n:2) Fluorotelomer Sulfonic Acids								
HDPE (no PTFE) (EP231X)								
0089_MW200_231213,	0089_MW195D_231213,	**13-Dec-2023**	**19-Dec-2023**	10-Jun-2024	✓	**19-Dec-2023**	10-Jun-2024	✓
0089_MW173_231213,	0089_MW193_231213,							
0089_QC301_231213,	0089_QC302_231213,							
0089_QC303_231213,	0089_QC401_231213,							
0089_QC402_231213,	0089_QC403_231213							
EP231P: PFAS Sums								
HDPE (no PTFE) (EP231X)								
0089_MW200_231213,	0089_MW195D_231213,	**13-Dec-2023**	**19-Dec-2023**	10-Jun-2024	✓	**19-Dec-2023**	10-Jun-2024	✓
0089_MW173_231213,	0089_MW193_231213,							
0089_QC301_231213,	0089_QC302_231213,							
0089_QC303_231213,	0089_QC401_231213,							
0089_QC402_231213,	0089_QC403_231213							

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)							
Alkalinity by Auto Titrator	ED037-P	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	4	40	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Alkalinity by Auto Titrator	ED037-P	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	40	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Alkalinity by Auto Titrator	ED037-P	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	40	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Chloride by Discrete Analyser	ED045G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	40	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	20	**5.00**	**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
Alkalinity by Auto Titrator	ED037-P	WATER	In house: Referenced to APHA 2320 B This procedure determines alkalinity by automated measurement (e.g. PC Titrate) on a settled supernatant aliquot of the sample using pH 4.5 for indicating the total alkalinity end-point. This method is compliant with NEPM Schedule B(3)
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	WATER	In house: Referenced to APHA 4500-SO4. Dissolved sulfate is determined in a 0.45um filtered sample. Sulfate ions are converted to a barium sulfate suspension in an acetic acid medium with barium chloride. Light absorbance of the BaSO4 suspension is measured by a photometer and the SO4-2 concentration is determined by comparison of the reading with a standard curve. This method is compliant with NEPM Schedule B(3)
Chloride by Discrete Analyser	ED045G	WATER	In house: Referenced to APHA 4500 Cl - G.The thiocyanate ion is liberated from mercuric thiocyanate through sequestration of mercury by the chloride ion to form non-ionised mercuric chloride. In the presence of ferric ions the liberated thiocynate forms highly-coloured ferric thiocynate which is measured at 480 nm.
Major Cations - Dissolved	ED093F	WATER	In house: Referenced to APHA 3120 and 3125; USEPA SW 846 - 6010 and 6020; Cations are determined by either ICP-AES or ICP-MS techniques. This method is compliant with NEPM Schedule B(3) Sodium Adsorption Ratio is calculated from Ca, Mg and Na which determined by ALS in house method QWI-EN/ED093F. This method is compliant with NEPM Schedule B(3) Hardness parameters are calculated based on APHA 2340 B. This method is compliant with NEPM Schedule B(3)
Ionic Balance by PCT DA and Turbi SO4 DA	* EN055 - PG	WATER	In house: Referenced to APHA 1030F. This method is compliant with NEPM Schedule B(3)
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.

ALSCompass
SAMPLING *Intelligence*

ALS

Environmental Division
Perth
Work Order Reference
EP2317755

Telephone : +61-8-9406 1301

Custody Document for Submissions via ALS Compass App

Project: WA-0089_PETSEND_23 **Client:** Stantec **Project Manager:** [redacted]

ALS Compass COC Reference: 61620; 61601; 61602 **# Samples:** **Phone:**

Sampler: [redacted]

Turnaround Requirements: Standard Urgent **Phone:**

Special Instructions:

Custody:

Relinquished by:	Received by:	Relinquished by:	Received by:
[redacted]	[redacted]		
Date / Time: 14/12/23	Date / Time: 1700 14/12	Date / Time:	Date / Time:

CHAIN OF CUSTODY

ALS COC#: 61600 ALS Laboratory: EP Perth Environmental

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

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP_23

SITE: Stirling SD - CG

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES 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 Sediments SEDIMENT	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
001	0089_SD351		14/12/2023 07:29 AM	SOIL	ALS: 1 Non ALS: 0	No	X		
002	0089_SD352		14/12/2023 07:29 AM	SOIL	ALS: 1 Non ALS: 0	No	X		
003	0089_SD381		14/12/2023 07:29 AM	SOIL	ALS: 1 Non ALS: 0	No	X		
004	0089_SD350		14/12/2023 07:30 AM	SOIL	ALS: 1 Non ALS: 0	No	X		
005	0089_SD401		14/12/2023 07:30 AM	SOIL	ALS: 1 Non ALS: 0	No	X		
006	0089_SD380		14/12/2023 07:31 AM	SOIL	ALS: 1 Non ALS: 0	No	X		

CHAIN OF CUSTODY

COC#: 61600 *ALS Laboratory:* EP Perth Environmental

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP_23

SITE: Stirling SD - CG

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO: [redacted]

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

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	0089_SD351	HDPE Soil Jar	200 mL	0621122024449	Grey	No	
002	0089_SD352	HDPE Soil Jar	200 mL	0621122024389	Grey	No	
003	0089_SD381	HDPE Soil Jar	200 mL	0621122024441	Grey	No	
004	0089_SD350	HDPE Soil Jar	200 mL	0621122011147	Grey	No	
005	0089_SD401	HDPE Soil Jar	200 mL	0621122024434	Grey	No	
006	0089_SD380	HDPE Soil Jar	200 mL	0621122024391	Grey	No	

Total Bottle Count: ALS: 6, Non ALS: 0

SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : **EP2317755**

Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: Customer Services EP
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
E-mail	: [redacted]stantec.com	E-mail	: ALSEnviro.Perth@alsglobal.com
Telephone	: ----	Telephone	: +61-8-9406 1301
Facsimile	: ----	Facsimile	: +61-8-9406 1399
Project	: WA_0089_PFASOMP_23	Page	: 1 of 2
Order number	: pfas-omp/Stirling	Quote number	: ES2022MWHAUS0002 (SY/139/19 B)
C-O-C number	: 61600	QC Level	: NEPM 2013 B3 & ALS QC Standard
Site	: Stirling SD - CG		
Sampler	: [redacted]		

Dates

Date Samples Received	: 14-Dec-2023 17:00	Issue Date	: 15-Dec-2023
Client Requested Due Date	: 27-Dec-2023	Scheduled Reporting Date	: **27-Dec-2023**

Delivery Details

Mode of Delivery	: Carrier	Security Seal	: Not Available
No. of coolers/boxes	: 1	Temperature	: 6.9 - Ice present
Receipt Detail	:	No. of samples received / analysed	: 6 / 6

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 see scanned COC for sample discrepencies: extra samples , samples not received etc.
- Please direct any queries related to sample condition / numbering / breakages to Sample Receipt (Samples.Perth@alsglobal.com)
- Analytical work for this work order will be conducted at ALS Environmental Perth.
- Please direct any turnaround / technical queries to the laboratory contact designated above.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months) from receipt of samples.
- **pH analysis should be conducted within 6 hours of sampling.**
- **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.**
- 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: **SOIL**

Laboratory sample ID	Sampling date / time	Sample ID	SOIL - EA055-103 Moisture Content	SOIL - EP231X (solids) PFAS - Full Suite (28 analytes)
EP2317755-001	14-Dec-2023 07:29	0089_SD351_231214	✓	✓
EP2317755-002	14-Dec-2023 07:29	0089_SD352_231214	✓	✓
EP2317755-003	14-Dec-2023 07:29	0089_SD381_231214	✓	✓
EP2317755-004	14-Dec-2023 07:30	0089_SD350_231214	✓	✓
EP2317755-005	14-Dec-2023 07:30	0089_SD401_231214	✓	✓
EP2317755-006	14-Dec-2023 07:31	0089_SD380_231214	✓	✓

Proactive Holding Time Report

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

Requested Deliverables

[redacted]
- A4 - AU Tax Invoice (INV) — Email — [redacted]cardno.com.au

DERP LAB REPORTS
- EDI Format - ESDAT (ESDAT) — Email — derp.labreports@esdat.com.au

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

CERTIFICATE OF ANALYSIS

Work Order	: **EP2317755**	Page	: 1 of 7
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: Customer Services EP
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: +61-8-9406 1301
Project	: WA_0089_PFASOMP_23	Date Samples Received	: 14-Dec-2023 17:00
Order number	: pfas-omp/Stirling	Date Analysis Commenced	: 15-Dec-2023
C-O-C number	: 61600	Issue Date	: 21-Dec-2023 15:53
Sampler	: [redacted]		
Site	: Stirling SD - CG		
Quote number	: SY/139/19 B		
No. of samples received	: 6		
No. of samples analysed	: 6		

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]	Inorganics Supervisor	Perth Inorganics, Wangara, WA
[redacted]	Senior Organic Chemist	Perth Organics, Wangara, WA

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.

- 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: SEDIMENT (Matrix: SOIL)				Sample ID	0089_SD351_231214	0089_SD352_231214	0089_SD381_231214	0089_SD350_231214	0089_SD401_231214
				Sampling date / time	14-Dec-2023 07:29	14-Dec-2023 07:29	14-Dec-2023 07:29	14-Dec-2023 07:30	14-Dec-2023 07:30
Compound	CAS Number	LOR	Unit		EP2317755-001	EP2317755-002	EP2317755-003	EP2317755-004	EP2317755-005
					Result	Result	Result	Result	Result
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content	---	0.1	%		31.7	28.8	26.8	28.2	28.2
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg		<0.001	<0.001	<0.001	<0.001	<0.001
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002

Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)				Sample ID	0089_SD351_231214	0089_SD352_231214	0089_SD381_231214	0089_SD350_231214	0089_SD401_231214
				Sampling date / time	14-Dec-2023 07:29	14-Dec-2023 07:29	14-Dec-2023 07:29	14-Dec-2023 07:30	14-Dec-2023 07:30
Compound	CAS Number	LOR	Unit		EP2317755-001	EP2317755-002	EP2317755-003	EP2317755-004	EP2317755-005
					Result	Result	Result	Result	Result
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
EP231P: PFAS Sums									
Sum of PFAS	---	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Sum of PFAS (WA DER List)	---	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
EP231S: PFAS Surrogate									
13C4-PFOS	---	0.0002	%		108	102	104	108	106
13C8-PFOA	---	0.0002	%		105	102	116	124	120

Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)				Sample ID	0089_SD380_231214	----	----	----	----
				Sampling date / time	14-Dec-2023 07:31	---	---	---	---
Compound	CAS Number	LOR	Unit		EP2317755-006	--------	--------	--------	--------
					Result	---	---	---	---
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content	---	0.1	%		25.5	----	----	----	----
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg		<0.0002	----	----	----	----
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg		<0.0002	----	----	----	----
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg		<0.0002	----	----	----	----
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg		<0.0002	----	----	----	----
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg		<0.0002	----	----	----	----
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg		<0.0002	----	----	----	----
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg		<0.001	----	----	----	----
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg		<0.0002	----	----	----	----
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg		<0.0002	----	----	----	----
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg		<0.0002	----	----	----	----
Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg		<0.0002	----	----	----	----
Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg		<0.0002	----	----	----	----
Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg		<0.0002	----	----	----	----
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg		<0.0002	----	----	----	----
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg		<0.0002	----	----	----	----
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg		<0.0002	----	----	----	----
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg		<0.0005	----	----	----	----
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg		<0.0002	----	----	----	----

Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)				Sample ID	0089_SD380_231214	----	----	----	----
				Sampling date / time	14-Dec-2023 07:31	---	---	---	---
Compound	CAS Number	LOR	Unit		EP2317755-006	--------	--------	--------	--------
					Result	---	---	---	---
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg		<0.0005	----	----	----	----
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg		<0.0005	----	----	----	----
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0 0005	mg/kg		<0.0005	----	----	----	----
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0 0005	mg/kg		0 0005	----	----	----	----
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg		0 0002	----	----	----	----
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg		<0.0002	----	----	----	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg		<0.0005	----	----	----	----
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg		<0.0005	----	----	----	----
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg		<0.0005	----	----	----	----
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg		<0.0005	----	----	----	----
EP231P: PFAS Sums									
Sum of PFAS	---	0.0002	mg/kg		<0.0002	----	----	----	----
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg		<0.0002	----	----	----	----
Sum of PFAS (WA DER List)	---	0.0002	mg/kg		<0.0002	----	----	----	----
EP231S: PFAS Surrogate									
13C4-PFOS	---	0.0002	%		100	----	----	----	----
13C8-PFOA	---	0.0002	%		115	----	----	----	----

Surrogate Control Limits

Sub-Matrix: **SEDIMENT**		Recovery Limits (%)	
Compound	*CAS Number*	*Low*	*High*
EP231S: PFAS Surrogate			
13C4-PFOS	---	76	136
13C8-PFOA	---	78	131

QUALITY CONTROL REPORT

Work Order	: **EP2317755**	Page	: 1 of 7
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: Customer Services EP
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: +61-8-9406 1301
Project	: WA_0089_PFASOMP_23	Date Samples Received	: 14-Dec-2023
Order number	: pfas-omp/Stirling	Date Analysis Commenced	: 15-Dec-2023
C-O-C number	: 61600	Issue Date	: 21-Dec-2023
Sampler	: [redacted]		
Site	: Stirling SD - CG		
Quote number	: SY/139/19 B		
No. of samples received	: 6		
No. of samples analysed	: 6		

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]	Inorganics Supervisor	Perth Inorganics, Wangara, WA
[redacted]	Senior Organic Chemist	Perth Organics, Wangara, WA

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: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
EA055: Moisture Content (Dried @ 105-110°C) (QC Lot: 5499441)									
EP2317630-001	Anonymous	EA055: Moisture Content	----	0.1	%	19.5	19.7	1.1	0% - 20%
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 5495867)									
EP2317755-001	0089_SD351_231214	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
EP2317813-002	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 5495867)									
EP2317755-001	0089_SD351_231214	EP231X: Perfluoropentanoic acid (PFPeA)	2706 90 3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335 76 2	0 0002	mg/kg	0 0002	0 0002	0 0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit

Sub-Matrix: **SOIL**

				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: 5495867) - continued									
EP2317755-001	0089_SD351_231214	EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	<0.001	0.0	No Limit
EP2317813-002	Anonymous	EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	0.0003	<0.0002	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	<0.001	0.0	No Limit
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 5495867)									
EP2317755-001	0089_SD351_231214	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355 31 9	0 0002	mg/kg	0 0002	0 0002	0 0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691 99 2	0 0005	mg/kg	0 0005	0 0005	0 0	No Limit
EP2317813-002	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506 32 8	0 0005	mg/kg	0 0005	0 0005	0 0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit

Sub-Matrix: **SOIL**

				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: 5495867) - continued									
EP2317813-002	Anonymous	EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 5495867)									
EP2317755-001	0089_SD351_231214	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
EP2317813-002	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
EP231P: PFAS Sums (QC Lot: 5495867)									
EP2317755-001	0089_SD351_231214	EP231X: Sum of PFAS	----	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Sum of PFAS (WA DER List)	----	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
EP2317813-002	Anonymous	EP231X: Sum of PFAS	----	0.0002	mg/kg	0.0003	<0.0002	0.0	No Limit
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Sum of PFAS (WA DER List)	----	0.0002	mg/kg	0.0003	<0.0002	0.0	No Limit

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: **SOIL**

				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: 5495867)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	0.0011 mg/kg	108	72.0	128
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	0.00125 mg/kg	114	73.0	123
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	0.00118 mg/kg	108	67.0	130
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	0.00119 mg/kg	117	70.0	132
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	0.00116 mg/kg	88.8	68.0	136
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	0.0012 mg/kg	92.1	59.0	134
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5495867)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	0.00625 mg/kg	104	71.0	135
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	0.00125 mg/kg	101	69.0	132
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	0.00125 mg/kg	103	70.0	132
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	0.00125 mg/kg	103	71.0	131
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	110	69.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	107	72.0	129
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	0.00125 mg/kg	90.0	69.0	133
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	114	64.0	136
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	100	69.0	135
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	111	66.0	139
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	0.00125 mg/kg	98.0	69.0	133
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5495867)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	0.00125 mg/kg	78.4	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	0.00312 mg/kg	107	59.6	143
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	0.00312 mg/kg	114	62.8	140
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	0.00312 mg/kg	90.2	61.5	139
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	0.00312 mg/kg	109	61.9	139
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	0.00125 mg/kg	110	63.0	144
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	0.00125 mg/kg	101	61.0	139
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5495867)								

Sub-Matrix: **SOIL**

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: 5495867) - continued								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	0.00117 mg/kg	110	62.0	145
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	0.00118 mg/kg	111	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	0.0012 mg/kg	109	65.0	137
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	0.0012 mg/kg	102	54.8	124
EP231P: PFAS Sums (QCLot: 5495867)								
EP231X: Sum of PFAS	---	0.0002	mg/kg	<0.0002	---	---	---	---
EP231X: Sum of PFHxS and PFOS	355-46-4/17 63-23-1	0.0002	mg/kg	<0.0002	---	---	---	---
EP231X: Sum of PFAS (WA DER List)	---	0.0002	mg/kg	<0.0002	---	---	---	---

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: **SOIL**

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: 5495867)							
EP2317755-002	0089_SD352_231214	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0011 mg/kg	100	72.0	128
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.00117 mg/kg	111	73.0	123
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.00118 mg/kg	96.6	67.0	130
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.00119 mg/kg	105	70.0	132
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.00116 mg/kg	108	68.0	136
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0012 mg/kg	100	59.0	134
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5495867)							
EP2317755-002	0089_SD352_231214	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.00625 mg/kg	102	71.0	135
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.00125 mg/kg	102	69.0	132
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.00125 mg/kg	108	70.0	132
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.00125 mg/kg	105	71.0	131
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.00125 mg/kg	117	69.0	133
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.00125 mg/kg	101	72.0	129
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.00125 mg/kg	105	69.0	133
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.00125 mg/kg	106	64.0	136
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.00125 mg/kg	113	69.0	135
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.00125 mg/kg	113	66.0	139
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.00125 mg/kg	102	69.0	133
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5495867)							

Sub-Matrix: **SOIL**

				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: 5495867) - continued							
EP2317755-002	0089_SD352_231214	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.00125 mg/kg	86.0	48.0	128
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.00312 mg/kg	87.4	60.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.00312 mg/kg	98.4	60.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.00312 mg/kg	93.4	60.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.00312 mg/kg	108	60.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.00125 mg/kg	115	63.0	144
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.00125 mg/kg	117	61.0	139
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5495867)							
EP2317755-002	0089_SD352_231214	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.00117 mg/kg	105	62.0	145
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.00118 mg/kg	109	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0012 mg/kg	105	65.0	137
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0012 mg/kg	110	60.0	130

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **EP2317755**	Page	: 1 of 4
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Telephone	: +61-8-9406 1301
Project	: WA_0089_PFASOMP_23	Date Samples Received	: 14-Dec-2023
Site	: Stirling SD - CG	Issue Date	: 21-Dec-2023
Sampler	: [redacted]	No. of samples received	: 6
Order number	: pfas-omp/Stirling	No. of samples analysed	: 6

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: **SOIL**

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
EA055: Moisture Content (Dried @ 105-110°C)								
HDPE Soil Jar (EA055)								
0089_SD351_231214,	0089_SD352_231214,	**14-Dec-2023**	**----**	----	----	**20-Dec-2023**	28-Dec-2023	✓
0089_SD381_231214,	0089_SD350_231214,							
0089_SD401_231214,	0089_SD380_231214							
EP231A: Perfluoroalkyl Sulfonic Acids								
HDPE Soil Jar (EP231X)								
0089_SD351_231214,	0089_SD352_231214,	**14-Dec-2023**	**15-Dec-2023**	11-Jun-2024	✓	**15-Dec-2023**	24-Jan-2024	✓
0089_SD381_231214,	0089_SD350_231214,							
0089_SD401_231214,	0089_SD380_231214							
EP231B: Perfluoroalkyl Carboxylic Acids								
HDPE Soil Jar (EP231X)								
0089_SD351_231214,	0089_SD352_231214,	**14-Dec-2023**	**15-Dec-2023**	11-Jun-2024	✓	**15-Dec-2023**	24-Jan-2024	✓
0089_SD381_231214,	0089_SD350_231214,							
0089_SD401_231214,	0089_SD380_231214							
EP231C: Perfluoroalkyl Sulfonamides								
HDPE Soil Jar (EP231X)								
0089_SD351_231214,	0089_SD352_231214,	**14-Dec-2023**	**15-Dec-2023**	11-Jun-2024	✓	**15-Dec-2023**	24-Jan-2024	✓
0089_SD381_231214,	0089_SD350_231214,							
0089_SD401_231214,	0089_SD380_231214							
EP231D: (n:2) Fluorotelomer Sulfonic Acids								
HDPE Soil Jar (EP231X)								
0089_SD351_231214,	0089_SD352_231214,	**14-Dec-2023**	**15-Dec-2023**	11-Jun-2024	✓	**15-Dec-2023**	24-Jan-2024	✓
0089_SD381_231214,	0089_SD350_231214,							
0089_SD401_231214,	0089_SD380_231214							
EP231P: PFAS Sums								
HDPE Soil Jar (EP231X)								
0089_SD351_231214,	0089_SD352_231214,	**14-Dec-2023**	**15-Dec-2023**	11-Jun-2024	✓	**15-Dec-2023**	24-Jan-2024	✓
0089_SD381_231214,	0089_SD350_231214,							
0089_SD401_231214,	0089_SD380_231214							

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: **SOIL**

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)							
Moisture Content	EA055	1	10	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	20	**5.00**	**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
Moisture Content	EA055	SOIL	In house: A gravimetric procedure based on weight loss over a 12 hour drying period at 105-110 degrees C. This method is compliant with NEPM Schedule B(3).
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	SOIL	In-house: Analysis of soils by solvent extraction followed by LC-Electrospray-MS-MS, Negative Mode using MRM using internal standard quantitation. Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to a portion of soil which is then extracted with MTBE and an ion pairing reagent. A portion of extract is exchanged into the analytical solvent mixture, combined with an equal volume reagent water and 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
QuECheRS Extraction of Solids	* ORG71	SOIL	In house: Sequential extractions with Acetonitrile/Methanol by shaking. Extraction efficiency aided by the addition of salts under acidic conditions. Where relevant, interferences from co-extracted organics are removed with dispersive clean-up media (dSPE). The extract is either diluted or concentrated and exchanged into the analytical solvent.

ALSCompass
SAMPLING *Intelligence*

ALS

Environmental Division
Perth
Work Order Reference
EP2317756

Telephone +61-8-9406 1301

Custody Document for Submissions via ALS Compass App

Project: WA_0089_PASEMP_23 **Client:** Strudec **Project Manager:** [redacted]
Phone:

ALS Compass COC Reference: 61620; 61601; 61600 **# Samples:** **Sampler:** [redacted]
Phone:

Turnaround Requirements: Standard Urgent

Special Instructions:

Custody:

Relinquished by: [redacted]	Received by: [redacted]	Relinquished by:	Received by:
Date / Time: 14/12/23	Date / Time: 1700 14/12	Date / Time:	Date / Time:

CHAIN OF CUSTODY

COC#: 61601 *ALS Laboratory:* EP Perth Environmental

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

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP_23

SITE: Stirling SW/PW - CG

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO: [redacted]

CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

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	WA OMP Water Suite WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
001	0089_PW381		14/12/2023 07:34 AM	WATER	ALS: 3 Non ALS: 0	No	X		
002	0089_PW352		14/12/2023 07:35 AM	WATER	ALS: 3 Non ALS: 0	No	X		
003	0089_PW351		14/12/2023 07:35 AM	WATER	ALS: 3 Non ALS: 0	No	X		
004	0089_SW382		14/12/2023 07:37 AM	WATER	ALS: 3 Non ALS: 0	No	X		
005	0089_PW380		14/12/2023 07:37 AM	WATER	ALS: 3 Non ALS: 0	No	X		
006	0089_SW383		14/12/2023 07:38 AM	WATER	ALS: 3 Non ALS: 0	No	X		
007	0089_PW401		14/12/2023 07:39 AM	WATER	ALS: 3 Non ALS: 0	No	X		

CHAIN OF CUSTODY

COC#: 61601 *ALS Laboratory:* EP Perth Environmental

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

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP_23

SITE: Stirling SW/PW - CG

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES 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	WA OMP Water Suite WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
008	0089_SW384		14/12/2023 07:40 AM	WATER	ALS: 3 Non ALS: 0	No	X		
009	0089_PW350		14/12/2023 07:41 AM	WATER	ALS: 3 Non ALS: 0	No	X		
010	0089_SW353		14/12/2023 07:43 AM	WATER	ALS: 3 Non ALS: 0	No	X		

CHAIN OF CUSTODY

ALS COC#: 61601 ALS Laboratory: EP Perth Environmental

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

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP_23

SITE: Stirling SW/PW - CG

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted]

QUOTE NO: SY/139/19 B

SAMPLER MOBILE: [redacted] / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO: [redacted]

TURNAROUND REQUIREMENTS : 5 Days

Bichazard 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	0089_PW381	Clear Plastic Bottle - Natural	125 mL	00070522229730	Green	No	
001	0089_PW381	HDPE (no PTFE)	20 mL	00352309068386	Grey	No	
001	0089_PW381	HDPE (no PTFE)	20 mL	00352309068162	Grey	No	
002	0089_PW352	Clear Plastic Bottle - Natural	125 mL	00070522229843	Green	No	
002	0089_PW352	HDPE (no PTFE)	20 mL	00352309068018	Grey	No	
002	0089_PW352	HDPE (no PTFE)	20 mL	00352309067948	Grey	No	
003	0089_PW351	Clear Plastic Bottle - Natural	125 mL	00070522229608	Green	No	
003	0089_PW351	HDPE (no PTFE)	20 mL	00352309067928	Grey	No	
003	0089_PW351	HDPE (no PTFE)	20 mL	00352309067909	Grey	No	
004	0089_SW382	Clear Plastic Bottle - Natural	125 mL	00070522229746	Green	No	
004	0089_SW382	HDPE (no PTFE)	20 mL	00352309067981	Grey	No	
004	0089_SW382	HDPE (no PTFE)	20 mL	00352309067926	Grey	No	
005	0089_PW380	Clear Plastic Bottle - Natural	125 mL	00070522229713	Green	No	
005	0089_PW380	HDPE (no PTFE)	20 mL	00352309067966	Grey	No	
005	0089_PW380	HDPE (no PTFE)	20 mL	00352309068136	Grey	No	
006	0089_SW383	HDPE (no PTFE)	20 mL	00352309068194	Grey	No	
006	0089_SW383	Clear Plastic Bottle - Natural	125 mL	00070522229750	Green	No	
006	0089_SW383	HDPE (no PTFE)	20 mL	00352309068058	Grey	No	
007	0089_PW401	HDPE (no PTFE)	20 mL	00352309068101	Grey	No	
007	0089_PW401	HDPE (no PTFE)	20 mL	00352309068375	Grey	No	
007	0089_PW401	Clear Plastic Bottle - Natural	125 mL	00070522229836	Green	No	
008	0089_SW384	Clear Plastic Bottle - Natural	125 mL	00070522229650	Green	No	
008	0089_SW384	HDPE (no PTFE)	20 mL	00352309067893	Grey	No	
008	0089_SW384	HDPE (no PTFE)	20 mL	00352309068117	Grey	No	
009	0089_PW350	Clear Plastic Bottle - Natural	125 mL	00070522229902	Green	No	
009	0089_PW350	HDPE (no PTFE)	20 mL	00352309068341	Grey	No	

CHAIN OF CUSTODY

ALS COC#: 61601 ALS Laboratory: EP Perth Environmental

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

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP_23

SITE: Stirling SW/PW - CG

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER:

CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO:

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:			

009	0089_PW350	HDPE (no PTFE)	20 mL	0035230906804 4	Grey	No	
010	0089_SW353	Clear Plastic Bottle - Natural	125 mL	00070522229741	Green	No	
010	0089_SW353	HDPE (no PTFE)	20 mL	0035230906807 4	Grey	No	
010	0089_SW353	HDPE (no PTFE)	20 mL	0035230906800 5	Grey	No	

Total Bottle Count: ALS: 30, Non ALS: 0

SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : **EP2317756**

Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: Customer Services EP
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
E-mail	: [redacted]stantec.com	E-mail	: ALSEnviro.Perth@alsglobal.com
Telephone	: ----	Telephone	: +61-8-9406 1301
Facsimile	: ----	Facsimile	: +61-8-9406 1399
Project	: WA_0089_PFASOMP_23	Page	: 1 of 2
Order number	: pfas-omp/Stirling	Quote number	: ES2022MWHAUS0002 (SY/139/19 B)
C-O-C number	: 61601	QC Level	: NEPM 2013 B3 & ALS QC Standard
Site	: Stirling SW/PW - CG		
Sampler	: [redacted]		

Dates

Date Samples Received	: 14-Dec-2023 17:00	Issue Date	: 15-Dec-2023
Client Requested Due Date	: 27-Dec-2023	Scheduled Reporting Date	: **22-Dec-2023**

Delivery Details

Mode of Delivery	: Carrier	Security Seal	: Not Available
No. of coolers/boxes	: 1	Temperature	: 6.9 - Ice present
Receipt Detail	:	No. of samples received / analysed	: 10 / 10

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 see scanned COC for sample discrepencies: extra samples , samples not received etc.
- Please direct any queries related to sample condition / numbering / breakages to Sample Receipt (Samples.Perth@alsglobal.com)
- Analytical work for this work order will be conducted at ALS Environmental Perth.
- Please direct any turnaround / technical queries to the laboratory contact designated above.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months) from receipt of samples.
- **pH analysis should be conducted within 6 hours of sampling.**
- **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.**
- 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)	WATER - NT-01 & 02 Ca, Mg, Na, K, Cl, SO4, Alkalinity
EP2317756-001	14-Dec-2023 07:34	0089_PW381_231214	✓	✓
EP2317756-002	14-Dec-2023 07:35	0089_PW352_231214	✓	✓
EP2317756-003	14-Dec-2023 07:35	0089_PW351_231214	✓	✓
EP2317756-004	14-Dec-2023 07:37	0089_SW382_231214	✓	✓
EP2317756-005	14-Dec-2023 07:37	0089_PW380_231214	✓	✓
EP2317756-006	14-Dec-2023 07:38	0089_SW383_231214	✓	✓
EP2317756-007	14-Dec-2023 07:39	0089_PW401_231214	✓	✓
EP2317756-008	14-Dec-2023 07:40	0089_SW384_231214	✓	✓
EP2317756-009	14-Dec-2023 07:41	0089_PW350_231214	✓	✓
EP2317756-010	14-Dec-2023 07:43	0089_SW353_231214	✓	✓

Proactive Holding Time Report

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

Requested Deliverables

[redacted]
- A4 - AU Tax Invoice (INV) — Email — [redacted]cardno.com.au

DERP LAB REPORTS
- EDI Format - ESDAT (ESDAT) — Email — derp.labreports@esdat.com.au

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

CERTIFICATE OF ANALYSIS

Work Order	: **EP2317756**	Page	: 1 of 9
Client	: **STANTEC AUSTRALIA PY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: Customer Services EP
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: +61-8-9406 1301
Project	: WA_0089_PFASOMP_23	Date Samples Received	: 14-Dec-2023 17:00
Order number	: pfas-omp/Stirling	Date Analysis Commenced	: 15-Dec-2023
C-O-C number	: 61601	Issue Date	: 22-Dec-2023 14:19
Sampler	: [redacted]		
Site	: Stirling SW/PW - CG		
Quote number	: SY/139/19 B		
No. of samples received	: 10		
No. of samples analysed	: 10		

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]	Inorganics Supervisor	Perth Inorganics, Wangara, WA
[redacted]	Senior Organic Chemist	Perth Organics, Wangara, WA

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.
- As per QWI – EN55-3 Data Interpreting Procedures, Ionic balances are typically calculated using Major Anions - Chloride, Alkalinity and Sulfate; and Major Cations - Calcium, Magnesium, Potassium and Sodium. Where applicable and dependent upon sample matrix, the Ionic Balance may also include the additional contribution of Ammonia, Dissolved Metals by ICPMS and H+ to the Cations and Nitrate, SiO2 and Fluoride to the Anions.
- Sodium Adsorption Ratio (where reported): Where results for Na, Ca or Mg are <LOR, a concentration at half the reported LOR is incorporated into the SAR calculation. This represents a conservative approach for Na relative to the assumption that <LOR = zero concentration and a conservative approach for Ca & Mg relative to the assumption that <LOR is equivalent to the LOR concentration.
- 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.
- ED045G: The presence of Thiocyanate, Thiosulfate and Sulfite can positively contribute to the chloride result, thereby may bias results higher than expected. Results should be scrutinised accordingly.

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_PW381_231214	0089_PW352_231214	0089_PW351_231214	0089_SW382_231214	0089_PW380_231214
				Sampling date / time	14-Dec-2023 07:34	14-Dec-2023 07:35	14-Dec-2023 07:35	14-Dec-2023 07:37	14-Dec-2023 07:37
Compound	CAS Number	LOR	Unit		EP2317756-001	EP2317756-002	EP2317756-003	EP2317756-004	EP2317756-005
					Result	Result	Result	Result	Result
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	<1	<1	<1	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	<1	<1	<1	<1
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		136	139	127	127	130
Total Alkalinity as CaCO3	---	1	mg/L		136	139	127	127	130
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		2720	2590	2540	2540	2620
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		17500	18000	17500	17200	18200
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		464	465	451	450	453
Magnesium	7439-95-4	1	mg/L		1480	1490	1450	1440	1450
Sodium	7440-23-5	1	mg/L		11200	11300	10900	10900	11000
Potassium	7440-09-7	1	mg/L		599	605	585	583	592
EN055: Ionic Balance									
ø Total Anions	---	0.01	meq/L		553	564	549	541	570
ø Total Cations	---	0.01	meq/L		647	653	631	630	636
ø Ionic Balance	---	0.01	%		7.87	7.26	6.94	7.64	5.39
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	<0.02	<0.02
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		<0.01	0.01	<0.01	0.25	<0.01
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		<0.02	<0.02	<0.02	0.04	<0.02
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		<0.01	0.03	<0.01	2.29	<0.01
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_PW381_231214	0089_PW352_231214	0089_PW351_231214	0089_SW382_231214	0089_PW380_231214
				Sampling date / time	14-Dec-2023 07:34	14-Dec-2023 07:35	14-Dec-2023 07:35	14-Dec-2023 07:37	14-Dec-2023 07:37
Compound	CAS Number	LOR	Unit		EP2317756-001	EP2317756-002	EP2317756-003	EP2317756-004	EP2317756-005
					Result	Result	Result	Result	Result
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	**0.14**	<0.02
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		<0.02	<0.02	<0.02	**0.16**	<0.02
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		<0.02	<0.02	<0.02	**0.07**	<0.02
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		<0.01	<0.01	<0.01	**0.06**	<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
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									

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_PW381_231214	0089_PW352_231214	0089_PW351_231214	0089_SW382_231214	0089_PW380_231214
				Sampling date / time	14-Dec-2023 07:34	14-Dec-2023 07:35	14-Dec-2023 07:35	14-Dec-2023 07:37	14-Dec-2023 07:37
Compound	CAS Number	LOR	Unit		EP2317756-001	EP2317756-002	EP2317756-003	EP2317756-004	EP2317756-005
					Result	Result	Result	Result	Result
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
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	**0.04**	<0.01	**3.04**	<0.01
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		<0.01	**0.04**	<0.01	**2.54**	<0.01
Sum of PFAS (WA DER List)	---	0.01	µg/L		<0.01	**0.04**	<0.01	**3.00**	<0.01
EP231S: PFAS Surrogate									
13C4-PFOS	---	0.02	%		**91.5**	**89.7**	**96.7**	**98.0**	**96.5**
13C8-PFOA	---	0.02	%		**93.2**	**95.7**	**106**	**103**	**101**

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_SW383_231214	0089_PW401_231214	0089_SW384_231214	0089_PW350_231214	0089_SW353_231214
				Sampling date / time	14-Dec-2023 07:38	14-Dec-2023 07:39	14-Dec-2023 07:40	14-Dec-2023 07:41	14-Dec-2023 07:43
Compound	CAS Number	LOR	Unit		EP2317756-006	EP2317756-007	EP2317756-008	EP2317756-009	EP2317756-010
					Result	Result	Result	Result	Result
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	<1	<1	<1	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	<1	<1	<1	<1
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		129	132	130	133	129
Total Alkalinity as CaCO3	---	1	mg/L		129	132	130	133	129
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		2470	2620	2550	2700	2660
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		17900	17900	17000	18100	18300
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		450	448	446	456	452
Magnesium	7439-95-4	1	mg/L		1440	1440	1430	1460	1460
Sodium	7440-23-5	1	mg/L		10900	10800	10800	11000	11000
Potassium	7440-09-7	1	mg/L		583	584	581	592	589
EN055: Ionic Balance									
ø Total Anions	---	0.01	meq/L		559	562	535	569	574
ø Total Cations	---	0.01	meq/L		630	626	624	636	636
ø Ionic Balance	---	0.01	%		5.98	5.34	7.70	5.56	5.13
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

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_SW383_231214	0089_PW401_231214	0089_SW384_231214	0089_PW350_231214	0089_SW353_231214
				Sampling date / time	14-Dec-2023 07:38	14-Dec-2023 07:39	14-Dec-2023 07:40	14-Dec-2023 07:41	14-Dec-2023 07:43
Compound	CAS Number	LOR	Unit		EP2317756-006	EP2317756-007	EP2317756-008	EP2317756-009	EP2317756-010
					Result	Result	Result	Result	Result
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
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									

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_SW383_231214	0089_PW401_231214	0089_SW384_231214	0089_PW350_231214	0089_SW353_231214
				Sampling date / time	14-Dec-2023 07:38	14-Dec-2023 07:39	14-Dec-2023 07:40	14-Dec-2023 07:41	14-Dec-2023 07:43
Compound	CAS Number	LOR	Unit		EP2317756-006	EP2317756-007	EP2317756-008	EP2317756-009	EP2317756-010
					Result	Result	Result	Result	Result
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
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	%		**91.2**	**86.2**	**95.9**	**91.9**	**93.4**
13C8-PFOA	---	0.02	%		**101**	**92.8**	**101**	**97.2**	**90.7**

Surrogate Control Limits

Sub-Matrix: SURFACE WATER		Recovery Limits (%)	
Compound	CAS Number	Low	High
EP231S: PFAS Surrogate			
13C4-PFOS	---	65	140
13C8-PFOA	---	71	133

QUALITY CONTROL REPORT

Work Order	: **EP2317756**	Page	: 1 of 10
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: Customer Services EP
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: +61-8-9406 1301
Project	: WA_0089_PFASOMP_23	Date Samples Received	: 14-Dec-2023
Order number	: pfas-omp/Stirling	Date Analysis Commenced	: 15-Dec-2023
C-O-C number	: 61601	Issue Date	: 22-Dec-2023
Sampler	: [redacted]		
Site	: Stirling SW/PW - CG		
Quote number	: SY/139/19 B		
No. of samples received	: 10		
No. of samples analysed	: 10		

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]	Inorganics Supervisor	Perth Inorganics, Wangara, WA
[redacted]	Senior Organic Chemist	Perth Organics, Wangara, WA

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 (%)
ED037P: Alkalinity by PC Titrator (QC Lot: 5505346)									
EP2317690-003	Anonymous	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	122	138	12.3	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	122	138	12.3	0% - 20%
EP2317701-007	Anonymous	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	441	441	0.0	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	441	441	0.0	0% - 20%
ED037P: Alkalinity by PC Titrator (QC Lot: 5505347)									
EP2317756-006	0089_SW383_231214	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	129	129	0.0	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	129	129	0.0	0% - 20%
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QC Lot: 5501011)									
EP2317729-001	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	204	195	4.2	0% - 20%
EP2317756-007	0089_PW401_231214	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	2620	2630	0.4	0% - 20%
ED045G: Chloride by Discrete Analyser (QC Lot: 5501012)									
EP2317729-001	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	1940	1900	2.3	0% - 20%
EP2317756-007	0089_PW401_231214	ED045G: Chloride	16887-00-6	1	mg/L	17900	17900	0.3	0% - 20%
ED093F: Dissolved Major Cations (QC Lot: 5501323)									

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 (%)
ED093F: Dissolved Major Cations (QC Lot: 5501323) - continued									
EP2317756-001	0089_PW381_231214	ED093F: Calcium	7440-70-2	1	mg/L	464	449	3.2	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	1480	1430	2.9	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	11200	10800	3.2	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	599	582	2.9	0% - 20%
EP2317854-001	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	<1	<1	0.0	No Limit
		ED093F: Magnesium	7439-95-4	1	mg/L	<1	<1	0.0	No Limit
		ED093F: Sodium	7440-23-5	1	mg/L	26	27	0.0	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	4	4	0.0	No Limit
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 5502773)									
EP2317628-001	Anonymous	EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	0.07	0.07	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 03	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: 5502975)									
EP2317628-007	Anonymous	EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01 (0.04)*	µg/L	22.4	19.0	16.3	0% - 20%
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01 (0.04)*	µg/L	56.8	48.0	16.8	0% - 20%
		EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	1.68	1.60	5.4	0% - 20%
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02 (0.04)*	µg/L	1.40	1.15	19.0	0% - 20%
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	3.69	3.46	6.3	0% - 20%
		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: 5502773)									
EP2317628-001	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
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 5502975)									
EP2317628-007	Anonymous	EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	1.40	1.28	8.3	0% - 20%
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	0.99	0.88	12.1	0% - 20%

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 (%)
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 5502975) - continued									
EP2317628-007	Anonymous	EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	4.46	3.73	17.7	0% - 20%
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	0.44	0.41	6.1	0% - 20%
		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	0.8	0.7	0.0	No Limit
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 5502773)									
EP2317628-001	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
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 5502975)									
EP2317628-007	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: 5502773)									
EP2317628-001	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

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 (%)
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 5502773) - continued									
EP2317628-001	Anonymous	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: 5502975)									
EP2317628-007	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: 5502773)									
EP2317628-001	Anonymous	EP231X: Sum of PFAS	----	0.01	µg/L	0.10	0.09	10.5	0% - 50%
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	0.07	0.07	0.0	No Limit
		EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	0.07	0.07	0.0	No Limit
EP231P: PFAS Sums (QC Lot: 5502975)									
EP2317628-007	Anonymous	EP231X: Sum of PFAS	----	0.01 (0.04)*	µg/L	94.1	80.2	15.9	0% - 20%
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01 (0.04)*	µg/L	79.2	67.0	16.7	0% - 20%
		EP231X: Sum of PFAS (WA DER List)	----	0.01 (0.04)*	µg/L	89.0	75.6	16.2	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
ED037P: Alkalinity by PC Titrator (QCLot: 5505346)								
ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	---	---	---	---
ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	---	---	---	---
ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	<1	---	---	---	---
ED037-P: Total Alkalinity as CaCO3	---	1	mg/L	<1	20 mg/L	112	85.1	126
				<1	200 mg/L	102	90.5	111
ED037P: Alkalinity by PC Titrator (QCLot: 5505347)								
ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	---	---	---	---
ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	---	---	---	---
ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	<1	---	---	---	---
ED037-P: Total Alkalinity as CaCO3	---	1	mg/L	<1	20 mg/L	114	85.1	126
				<1	200 mg/L	105	90.5	111
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 5501011)								
ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<1	25 mg/L	96.9	89.9	112
				<1	500 mg/L	100.0	89.9	112
ED045G: Chloride by Discrete Analyser (QCLot: 5501012)								
ED045G: Chloride	16887-00-6	1	mg/L	<1	10 mg/L	100	88.6	113
				<1	1000 mg/L	101	88.6	113
ED093F: Dissolved Major Cations (QCLot: 5501323)								
ED093F: Calcium	7440-70-2	1	mg/L	<1	50 mg/L	100	86.5	117
ED093F: Magnesium	7439-95-4	1	mg/L	<1	50 mg/L	99.8	88.4	110
ED093F: Sodium	7440-23-5	1	mg/L	<1	50 mg/L	98.3	91.4	113
ED093F: Potassium	7440-09-7	1	mg/L	<1	50 mg/L	96.9	84.6	108
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5502773)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.2218 µg/L	92.9	72.0	130
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.2352 µg/L	108	71.0	127
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	0.2373 µg/L	92.7	68.0	131
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.238 µg/L	102	69.0	134
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.232 µg/L	97.2	65.0	140
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.241 µg/L	92.7	53.0	142

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
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5502975)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.2218 µg/L	96.2	72.0	130
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.2352 µg/L	101	71.0	127
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	0.2373 µg/L	94.2	68.0	131
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.238 µg/L	92.8	69.0	134
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.232 µg/L	90.1	65.0	140
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.241 µg/L	86.5	53.0	142
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5502773)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	1.25 µg/L	95.1	73.0	129
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	0.25 µg/L	93.2	72.0	129
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	0.25 µg/L	103	72.0	129
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	0.25 µg/L	101	72.0	130
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	0.25 µg/L	105	71.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	0.25 µg/L	94.6	69.0	130
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	0.25 µg/L	93.4	71.0	129
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	0.25 µg/L	88.2	69.0	133
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	0.25 µg/L	99.4	72.0	134
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	0.25 µg/L	102	65.0	144
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	0.25 µg/L	100	71.0	132
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5502975)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	1.25 µg/L	94.4	73.0	129
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	0.25 µg/L	98.6	72.0	129
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	0.25 µg/L	88.4	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
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	87.8	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	118	69.0	133
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	0.25 µg/L	88.8	72.0	134
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	0.25 µg/L	90.0	65.0	144
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	0.25 µg/L	104	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5502773)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.25 µg/L	82.0	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	92.4	60.5	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
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5502773) - continued								
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	0.625 µg/L	91.4	68.3	134
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	0.625 µg/L	104	62.2	138
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	0.25 µg/L	98.4	65.0	136
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	0.25 µg/L	104	61.0	135
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5502975)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.25 µg/L	95.6	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	0.625 µg/L	104	68.0	141
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	0.625 µg/L	78.3	60.5	138
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	0.625 µg/L	113	68.3	134
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	0.625 µg/L	92.8	62.2	138
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	0.25 µg/L	88.4	65.0	136
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	0.25 µg/L	108	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5502773)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.2343 µg/L	110	63.0	143
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	0.2378 µg/L	117	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	0.24 µg/L	115	67.0	138
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	0.241 µg/L	98.1	64.2	133
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5502975)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.2343 µg/L	96.2	63.0	143
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	0.2378 µg/L	91.2	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	0.24 µg/L	86.4	67.0	138
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	0.241 µg/L	83.4	64.2	133
EP231P: PFAS Sums (QCLot: 5502773)								
EP231X: Sum of PFAS	---	0.01	µg/L	<0.01	---	---	---	---
EP231X: Sum of PFHxS and PFOS	355-46-4/17 63-23-1	0.01	µg/L	<0.01	---	---	---	---
EP231X: Sum of PFAS (WA DER List)	---	0.01	µg/L	<0.01	---	---	---	---
EP231P: PFAS Sums (QCLot: 5502975)								
EP231X: Sum of PFAS	---	0.01	µg/L	<0.01	---	---	---	---

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	LCS: Spike Recovery (%)	Acceptable Limits (%): Low	Acceptable Limits (%): High
EP231P: PFAS Sums (QCLot: 5502975) - continued								
EP231X: Sum of PFHxS and PFOS	355-46-4/17 63-23-1	0.01	µg/L	<0.01	---	---	---	---
EP231X: Sum of PFAS (WA DER List)	---	0.01	µg/L	<0.01	---	---	---	---

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
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 5501011)							
EP2317729-001	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	100 mg/L	114	70.4	130
ED045G: Chloride by Discrete Analyser (QCLot: 5501012)							
EP2317729-001	Anonymous	ED045G: Chloride	16887-00-6	200 mg/L	# Not Determined	70.0	130
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5502975)							
EP2317628-011	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.2218 µg/L	93.5	72.0	129
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.232 µg/L	114	71.0	127
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.2352 µg/L	86.5	68.0	129
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.238 µg/L	91.6	69.0	134
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.232 µg/L	95.1	65.0	140
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.241 µg/L	80.1	53.0	129
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5502975)							
EP2317628-011	Anonymous	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	1.25 µg/L	97.5	73.0	142
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.25 µg/L	93.8	72.0	129
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.25 µg/L	97.2	72.0	129
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.25 µg/L	86.6	72.0	130
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.25 µg/L	98.4	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	103	71.0	134
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.25 µg/L	118	69.0	133
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.25 µg/L	91.0	72.0	134
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.25 µg/L	90.6	65.0	144
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.25 µg/L	106	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5502975)							
EP2317628-011	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.25 µg/L	99.4	59.0	135

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: 5502975) - continued							
EP2317628-011	Anonymous	EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.625 µg/L	88.0	70.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.625 µg/L	74.0	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.625 µg/L	98.1	70.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.625 µg/L	79.7	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.25 µg/L	86.8	65.0	136
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.25 µg/L	98.8	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5502975)							
EP2317628-011	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.234 µg/L	98.1	63.0	143
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.2378 µg/L	84.8	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.24 µg/L	83.1	67.0	138
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.2415 µg/L	88.2	70.0	130

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **EP2317756**	Page	: 1 of 6
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Telephone	: +61-8-9406 1301
Project	: WA_0089_PFASOMP_23	Date Samples Received	: 14-Dec-2023
Site	: Stirling SW/PW - CG	Issue Date	: 22-Dec-2023
Sampler	: [redacted]	No. of samples received	: 10
Order number	: pfas-omp/Stirling	No. of samples analysed	: 10

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

Outliers : Analysis Holding Time Compliance

- **Analysis Holding Time Outliers exist - please see following pages for full details.**

Outliers : Frequency of Quality Control Samples

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

Outliers : Quality Control Samples

Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

Matrix: **WATER**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
Matrix Spike (MS) Recoveries							
ED045G: Chloride by Discrete Analyser	EP2317729--001	Anonymous	**Chloride**	16887-00-6	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**

Outliers : Analysis Holding Time Compliance

Matrix: **WATER**

Method / Container / Client Sample ID(s)	Extraction / Preparation: Date extracted	Extraction / Preparation: Due for extraction	Extraction / Preparation: Days overdue	Analysis: Date analysed	Analysis: Due for analysis	Analysis: Days overdue
ED093F: Dissolved Major Cations						
Clear Plastic Bottle - Natural						
0089_PW381_231214, 0089_PW352_231214,	----	----	----	22-Dec-2023	21-Dec-2023	1
0089_PW351_231214, 0089_SW382_231214,						
0089_PW380_231214, 0089_SW383_231214,						
0089_PW401_231214, 0089_SW384_231214,						
0089_PW350_231214, 0089_SW353_231214						

Outliers : Frequency of Quality Control Samples

Matrix: **WATER**

Quality Control Sample Type / Analytical Methods	Method	Count: QC	Count: Regular	Rate (%): Actual	Rate (%): Expected	Quality Control Specification
Laboratory Duplicates (DUP)						
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	37	5.41	10.00	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)						
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	37	2.70	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	Extraction / Preparation: Due for extraction	Extraction / Preparation: Evaluation	Analysis: Date analysed	Analysis: Due for analysis	Analysis: Evaluation

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
ED037P: Alkalinity by PC Titrator								
Clear Plastic Bottle - Natural (ED037-P)								
0089_PW381_231214,	0089_PW352_231214,	**14-Dec-2023**	---	---	---	**20-Dec-2023**	28-Dec-2023	✓
0089_PW351_231214,	0089_SW382_231214,							
0089_PW380_231214,	0089_SW383_231214,							
0089_PW401_231214,	0089_SW384_231214,							
0089_PW350_231214,	0089_SW353_231214							
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA								
Clear Plastic Bottle - Natural (ED041G)								
0089_PW381_231214,	0089_PW352_231214,	**14-Dec-2023**	---	---	---	**22-Dec-2023**	11-Jan-2024	✓
0089_PW351_231214,	0089_SW382_231214,							
0089_PW380_231214,	0089_SW383_231214,							
0089_PW401_231214,	0089_SW384_231214,							
0089_PW350_231214,	0089_SW353_231214							
ED045G: Chloride by Discrete Analyser								
Clear Plastic Bottle - Natural (ED045G)								
0089_PW381_231214,	0089_PW352_231214,	**14-Dec-2023**	---	---	---	**22-Dec-2023**	11-Jan-2024	✓
0089_PW351_231214,	0089_SW382_231214,							
0089_PW380_231214,	0089_SW383_231214,							
0089_PW401_231214,	0089_SW384_231214,							
0089_PW350_231214,	0089_SW353_231214							
ED093F: Dissolved Major Cations								
Clear Plastic Bottle - Natural (ED093F)								
0089_PW381_231214,	0089_PW352_231214,	**14-Dec-2023**	---	---	---	**22-Dec-2023**	21-Dec-2023	×
0089_PW351_231214,	0089_SW382_231214,							
0089_PW380_231214,	0089_SW383_231214,							
0089_PW401_231214,	0089_SW384_231214,							
0089_PW350_231214,	0089_SW353_231214							
EP231A: Perfluoroalkyl Sulfonic Acids								
HDPE (no PTFE) (EP231X)								
0089_PW381_231214,	0089_PW352_231214,	**14-Dec-2023**	**19-Dec-2023**	11-Jun-2024	✓	**19-Dec-2023**	11-Jun-2024	✓
0089_PW351_231214,	0089_PW380_231214,							
0089_SW383_231214,	0089_PW401_231214,							
0089_SW384_231214,	0089_PW350_231214,							
0089_SW353_231214								
HDPE (no PTFE) (EP231X)								
0089_SW382_231214		**14-Dec-2023**	**19-Dec-2023**	11-Jun-2024	✓	**20-Dec-2023**	11-Jun-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)							
0089_PW381_231214, 0089_PW352_231214, 0089_PW351_231214, 0089_PW380_231214, 0089_SW383_231214, 0089_PW401_231214, 0089_SW384_231214, 0089_PW350_231214, 0089_SW353_231214	**14-Dec-2023**	**19-Dec-2023**	11-Jun-2024	✓	**19-Dec-2023**	11-Jun-2024	✓
HDPE (no PTFE) (EP231X)							
0089_SW382_231214	**14-Dec-2023**	**19-Dec-2023**	11-Jun-2024	✓	**20-Dec-2023**	11-Jun-2024	✓
EP231C: Perfluoroalkyl Sulfonamides							
HDPE (no PTFE) (EP231X)							
0089_PW381_231214, 0089_PW352_231214, 0089_PW351_231214, 0089_PW380_231214, 0089_SW383_231214, 0089_PW401_231214, 0089_SW384_231214, 0089_PW350_231214, 0089_SW353_231214	**14-Dec-2023**	**19-Dec-2023**	11-Jun-2024	✓	**19-Dec-2023**	11-Jun-2024	✓
HDPE (no PTFE) (EP231X)							
0089_SW382_231214	**14-Dec-2023**	**19-Dec-2023**	11-Jun-2024	✓	**20-Dec-2023**	11-Jun-2024	✓
EP231D: (n:2) Fluorotelomer Sulfonic Acids							
HDPE (no PTFE) (EP231X)							
0089_PW381_231214, 0089_PW352_231214, 0089_PW351_231214, 0089_PW380_231214, 0089_SW383_231214, 0089_PW401_231214, 0089_SW384_231214, 0089_PW350_231214, 0089_SW353_231214	**14-Dec-2023**	**19-Dec-2023**	11-Jun-2024	✓	**19-Dec-2023**	11-Jun-2024	✓
HDPE (no PTFE) (EP231X)							
0089_SW382_231214	**14-Dec-2023**	**19-Dec-2023**	11-Jun-2024	✓	**20-Dec-2023**	11-Jun-2024	✓
EP231P: PFAS Sums							
HDPE (no PTFE) (EP231X)							
0089_PW381_231214, 0089_PW352_231214, 0089_PW351_231214, 0089_PW380_231214, 0089_SW383_231214, 0089_PW401_231214, 0089_SW384_231214, 0089_PW350_231214, 0089_SW353_231214	**14-Dec-2023**	**19-Dec-2023**	11-Jun-2024	✓	**19-Dec-2023**	11-Jun-2024	✓
HDPE (no PTFE) (EP231X)							
0089_SW382_231214	**14-Dec-2023**	**19-Dec-2023**	11-Jun-2024	✓	**20-Dec-2023**	11-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)							
Alkalinity by Auto Titrator	ED037-P	3	25	**12.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	2	16	**12.50**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	37	**5.41**	**10.00**	×	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Alkalinity by Auto Titrator	ED037-P	4	25	**16.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	1	16	**6.25**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	37	**5.41**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Alkalinity by Auto Titrator	ED037-P	2	25	**8.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	1	16	**6.25**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	37	**5.41**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Chloride by Discrete Analyser	ED045G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	37	**2.70**	**5.00**	×	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	20	**5.00**	**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
Alkalinity by Auto Titrator	ED037-P	WATER	In house: Referenced to APHA 2320 B This procedure determines alkalinity by automated measurement (e.g. PC Titrate) on a settled supernatant aliquot of the sample using pH 4.5 for indicating the total alkalinity end-point. This method is compliant with NEPM Schedule B(3)
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	WATER	In house: Referenced to APHA 4500-SO4. Dissolved sulfate is determined in a 0.45um filtered sample. Sulfate ions are converted to a barium sulfate suspension in an acetic acid medium with barium chloride. Light absorbance of the BaSO4 suspension is measured by a photometer and the SO4-2 concentration is determined by comparison of the reading with a standard curve. This method is compliant with NEPM Schedule B(3)
Chloride by Discrete Analyser	ED045G	WATER	In house: Referenced to APHA 4500 Cl - G.The thiocyanate ion is liberated from mercuric thiocyanate through sequestration of mercury by the chloride ion to form non-ionised mercuric chloride. In the presence of ferric ions the liberated thiocynate forms highly-coloured ferric thiocynate which is measured at 480 nm.
Major Cations - Dissolved	ED093F	WATER	In house: Referenced to APHA 3120 and 3125; USEPA SW 846 - 6010 and 6020; Cations are determined by either ICP-AES or ICP-MS techniques. This method is compliant with NEPM Schedule B(3) Sodium Adsorption Ratio is calculated from Ca, Mg and Na which determined by ALS in house method QWI-EN/ED093F. This method is compliant with NEPM Schedule B(3) Hardness parameters are calculated based on APHA 2340 B. This method is compliant with NEPM Schedule B(3)
Ionic Balance by PCT DA and Turbi SO4 DA	* EN055 - PG	WATER	In house: Referenced to APHA 1030F. This method is compliant with NEPM Schedule B(3)
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.

ALSCompass
SAMPLING *Intelligence*

Environmental Division
Perth
Work Order Reference
EP2317757

Telephone - 61-8-9406 1301

Custody Document for Submissions via ALS Compass App

Project: WA-0089 PATSOUP 23 **Client:** Strabee **Project Manager:** [redacted]

Phone: [redacted]

ALS Compass COC Reference: 61620, 61601, 61600 **# Samples:** **Sampler:**

Phone:

Turnaround Requirements: Standard Urgent

Special Instructions:

Custody:

Relinquished by:	Received by:	Relinquished by:	Received by:
[redacted]	[redacted]		
Date / Time: 14/12/23	Date / Time: 1700 14/12	Date / Time:	Date / Time:

CHAIN OF CUSTODY

COC#: 61620 ALS Laboratory: EP Perth Environmental

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

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP_23

SITE: Stirling GW - CG

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES 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	Rinsate WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
001	0089_QC402		14/12/2023 10:01 AM	WATER	ALS: 2 Non ALS: 0	No	X		
002	0089_QC401		14/12/2023 10:02 AM	WATER	ALS: 2 Non ALS: 0	No	X		
003	0089_QC302		14/12/2023 10:03 AM	WATER	ALS: 2 Non ALS: 0	No	X		
004	0089_QC301		14/12/2023 10:04 AM	WATER	ALS: 2 Non ALS: 0	No	X		

CHAIN OF CUSTODY

COC#: 61620 ALS Laboratory: EP Perth Environmental

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP_23

SITE: Stirling GW - CG

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted]

QUOTE NO: SY/139/19 B

SAMPLER MOBILE: [redacted] / ES2022MWHAUS0002

EMAIL REPORTS TO [redacted]

EMAIL INVOICES TO [redacted]

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

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	0089_QC402	HDPE (no PTFE)	20 mL	00352309068322	Grey	No	
001	0089_QC402	HDPE (no PTFE)	20 mL	00352309068033	Grey	No	
002	0089_QC401	HDPE (no PTFE)	20 mL	00352309068146	Grey	No	
002	0089_QC401	HDPE (no PTFE)	20 mL	00352309067979	Grey	No	
003	0089_QC302	HDPE (no PTFE)	20 mL	00352309068087	Grey	No	
003	0089_QC302	HDPE (no PTFE)	20 mL	00352309068090	Grey	No	
004	0089_QC301	HDPE (no PTFE)	20 mL	00352309068041	Grey	No	
004	0089_QC301	HDPE (no PTFE)	20 mL	00352309067953	Grey	No	

Total Bottle Count: ALS: 8, Non ALS: 0

SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : **EP2317757**

Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: Customer Services EP
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
E-mail	: [redacted]stantec.com	E-mail	: ALSEnviro.Perth@alsglobal.com
Telephone	: ----	Telephone	: +61-8-9406 1301
Facsimile	: ----	Facsimile	: +61-8-9406 1399
Project	: WA_0089_PFASOMP_23	Page	: 1 of 2
Order number	: pfas-omp/Stirling	Quote number	: ES2022MWHAUS0002 (SY/139/19 B)
C-O-C number	: 61620	QC Level	: NEPM 2013 B3 & ALS QC Standard
Site	: Stirling GW - CG		
Sampler	: [redacted]		

Dates

Date Samples Received	: 14-Dec-2023 17:00	Issue Date	: 15-Dec-2023
Client Requested Due Date	: 27-Dec-2023	Scheduled Reporting Date	: **27-Dec-2023**

Delivery Details

Mode of Delivery	: Carrier	Security Seal	: Not Available
No. of coolers/boxes	: 1	Temperature	: 6.9 - Ice present
Receipt Detail	:	No. of samples received / analysed	: 4 / 4

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 see scanned COC for sample discrepencies: extra samples , samples not received etc.
- Please direct any queries related to sample condition / numbering / breakages to Sample Receipt (Samples.Perth@alsglobal.com)
- Analytical work for this work order will be conducted at ALS Environmental Perth.
- Please direct any turnaround / technical queries to the laboratory contact designated above.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months) from receipt of samples.
- **pH analysis should be conducted within 6 hours of sampling.**
- **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.**
- 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)
EP2317757-001	14-Dec-2023 10:01	0089_QC402_231214	✓
EP2317757-002	14-Dec-2023 10:02	0089_QC401_231214	✓
EP2317757-003	14-Dec-2023 10:03	0089_QC302_231214	✓
EP2317757-004	14-Dec-2023 10:04	0089_QC301_231214	✓

Proactive Holding Time Report

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

Requested Deliverables

[redacted]
- A4 - AU Tax Invoice (INV) — Email — [redacted]cardno.com.au

DERP LAB REPORTS
- EDI Format - ESDAT (ESDAT) — Email — derp.labreports@esdat.com.au

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

CERTIFICATE OF ANALYSIS

Work Order	: **EP2317757**	Page	: 1 of 5
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: Customer Services EP
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: +61-8-9406 1301
Project	: WA_0089_PFASOMP_23	Date Samples Received	: 14-Dec-2023 17:00
Order number	: pfas-omp/Stirling	Date Analysis Commenced	: 15-Dec-2023
C-O-C number	: 61620	Issue Date	: 20-Dec-2023 15:46
Sampler	: [redacted] [redacted]		
Site	: Stirling GW - CG		
Quote number	: SY/139/19 B		
No. of samples received	: 4		
No. of samples analysed	: 4		

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]	Senior Organic Chemist	Perth Organics, Wangara, WA

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: GROUNDWATER (Matrix: WATER)				Sample ID	0089_QC402_231214	0089_QC401_231214	0089_QC302_231214	0089_QC301_231214	----
				Sampling date / time	14-Dec-2023 10:01	14-Dec-2023 10:02	14-Dec-2023 10:03	14-Dec-2023 10:04	----
Compound	CAS Number	LOR	Unit		EP2317757-001	EP2317757-002	EP2317757-003	EP2317757-004	--------
					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		<0.01	<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	----
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		<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	----
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		<0.02	<0.02	<0.02	<0.02	----
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
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	----

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_QC402_231214	0089_QC401_231214	0089_QC302_231214	0089_QC301_231214	----
				Sampling date / time	14-Dec-2023 10:01	14-Dec-2023 10:02	14-Dec-2023 10:03	14-Dec-2023 10:04	----
Compound	CAS Number	LOR	Unit		EP2317757-001	EP2317757-002	EP2317757-003	EP2317757-004	--------
					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	----
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		<0.01	<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	----
Sum of PFAS (WA DER List)	---	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	----
EP231S: PFAS Surrogate									
13C4-PFOS	---	0.02	%		**96.9**	**98.7**	**103**	**101**	----
13C8-PFOA	---	0.02	%		**101**	**93.3**	**96.1**	**95.3**	----

Surrogate Control Limits

Sub-Matrix: GROUNDWATER		Recovery Limits (%)	
Compound	CAS Number	Low	High
EP231S: PFAS Surrogate			
13C4-PFOS	---	65	140
13C8-PFOA	---	71	133

QUALITY CONTROL REPORT

Work Order	: **EP2317757**	Page	: 1 of 5
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: Customer Services EP
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: +61-8-9406 1301
Project	: WA_0089_PFASOMP_23	Date Samples Received	: 14-Dec-2023
Order number	: pfas-omp/Stirling	Date Analysis Commenced	: 15-Dec-2023
C-O-C number	: 61620	Issue Date	: 20-Dec-2023
Sampler	: [redacted]		
Site	: Stirling GW - CG		
Quote number	: SY/139/19 B		
No. of samples received	: 4		
No. of samples analysed	: 4		

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]	Senior Organic Chemist	Perth Organics, Wangara, WA

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: 5502775)									
EP2317628-008	Anonymous	EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	0.38	0.38	0.0	0% - 20%
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	0.12	0.10	11.4	0% - 50%
		EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	0.05	0.06	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	0.11	0.11	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: 5502775)									
EP2317628-008	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	0.06	0.06	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: 5502775)									
EP2317628-008	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

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: 5502775) - continued									
EP2317628-008	Anonymous	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: 5502775)									
EP2317628-008	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: 5502775)									
EP2317628-008	Anonymous	EP231X: Sum of PFAS	----	0.01	µg/L	0.73	0.72	1.4	0% - 20%
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	0.50	0.48	4.1	0% - 20%
		EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	0.62	0.61	1.6	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: 5502775)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.2218 µg/L	97.8	72.0	130
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.2352 µg/L	111	71.0	127
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	0.2373 µg/L	97.1	68.0	131
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.238 µg/L	93.7	69.0	134
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.232 µg/L	88.4	65.0	140
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.241 µg/L	88.0	53.0	142
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5502775)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	1.25 µg/L	98.2	73.0	129
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	0.25 µg/L	91.2	72.0	129
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	0.25 µg/L	103	72.0	129
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	0.25 µg/L	101	72.0	130
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	0.25 µg/L	111	71.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	0.25 µg/L	117	69.0	130
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	0.25 µg/L	89.6	71.0	129
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	0.25 µg/L	95.8	69.0	133
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	0.25 µg/L	101	72.0	134
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	0.25 µg/L	94.6	65.0	144
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	0.25 µg/L	98.0	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5502775)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.25 µg/L	70.4	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	0.625 µg/L	113	68.0	141
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	0.625 µg/L	106	60.5	138
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	0.625 µg/L	90.3	68.3	134
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	0.625 µg/L	110	62.2	138
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	0.25 µg/L	101	65.0	136
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	0.25 µg/L	79.6	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5502775)								

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
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5502775) - continued								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.2343 µg/L	101	63.0	143
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	0.2378 µg/L	94.4	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	0.24 µg/L	105	67.0	138
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	0.241 µg/L	78.6	64.2	133
EP231P: PFAS Sums (QCLot: 5502775)								
EP231X: Sum of PFAS	---	0.01	µg/L	<0.01	---	---	---	---
EP231X: Sum of PFHxS and PFOS	355-46-4/17 63-23-1	0.01	µg/L	<0.01	---	---	---	---
EP231X: Sum of PFAS (WA DER List)	---	0.01	µg/L	<0.01	---	---	---	---

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.

- **No Matrix Spike (MS) or Matrix Spike Duplicate (MSD) Results are required to be reported.**

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **EP2317757**	Page	: 1 of 4
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Telephone	: +61-8-9406 1301
Project	: WA_0089_PFASOMP_23	Date Samples Received	: 14-Dec-2023
Site	: Stirling GW - CG	Issue Date	: 20-Dec-2023
Sampler	: [redacted]	No. of samples received	: 4
Order number	: pfas-omp/Stirling	No. of samples analysed	: 4

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	15	6.67	10.00	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)						
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	0	15	0.00	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*			*Analysis*		
		Date extracted	*Due for extraction*	*Evaluation*	*Date analysed*	*Due for analysis*	*Evaluation*
EP231A: Perfluoroalkyl Sulfonic Acids							
HDPE (no PTFE) (EP231X)							
0089_QC402_231214, 0089_QC401_231214, 0089_QC302_231214, 0089_QC301_231214	**14-Dec-2023**	**19-Dec-2023**	11-Jun-2024	✓	**19-Dec-2023**	11-Jun-2024	✓
EP231B: Perfluoroalkyl Carboxylic Acids							
HDPE (no PTFE) (EP231X)							
0089_QC402_231214, 0089_QC401_231214, 0089_QC302_231214, 0089_QC301_231214	**14-Dec-2023**	**19-Dec-2023**	11-Jun-2024	✓	**19-Dec-2023**	11-Jun-2024	✓
EP231C: Perfluoroalkyl Sulfonamides							
HDPE (no PTFE) (EP231X)							
0089_QC402_231214, 0089_QC401_231214, 0089_QC302_231214, 0089_QC301_231214	**14-Dec-2023**	**19-Dec-2023**	11-Jun-2024	✓	**19-Dec-2023**	11-Jun-2024	✓
EP231D: (n:2) Fluorotelomer Sulfonic Acids							
HDPE (no PTFE) (EP231X)							
0089_QC402_231214, 0089_QC401_231214, 0089_QC302_231214, 0089_QC301_231214	**14-Dec-2023**	**19-Dec-2023**	11-Jun-2024	✓	**19-Dec-2023**	11-Jun-2024	✓
EP231P: PFAS Sums							
HDPE (no PTFE) (EP231X)							
0089_QC402_231214, 0089_QC401_231214, 0089_QC302_231214, 0089_QC301_231214	**14-Dec-2023**	**19-Dec-2023**	11 Jun 2024	✓	**19-Dec-2023**	11 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	1	15	6.67	10.00	×	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	15	6.67	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	15	6.67	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	0	15	0.00	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.

ALSCompass
SAMPLING *Intelligence*

ALS

Environmental Division
Perth
Work Order Reference
EP2317849

Telephone : 61-8-9406 1301

Custody Document for Submissions via ALS Compass App

Project: WA_0059_PFASOMP_23 **Client:** Stantec **Project Manager:** [redacted]

Phone:

ALS Compass COC Reference: 61564; 61565; 61534; 61532; 61516; 61523; 61521; 61520; 61533 **# Samples:** 2 Eskies **Sampler:** [redacted]

Phone:

Turnaround Requirements: Standard ____ Urgent ____

Special Instructions:

Custody:

Relinquished by:	Received by:	Relinquished by:	Received by:
[redacted]	[redacted]		
Date / Time: 13/12/23	Date / Time: 13/12 @ 1700.	Date / Time:	Date / Time:

CHAIN OF CUSTODY

COC#: **61534** *ALS Laboratory:* EP Perth Environmental

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

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP_23

SITE: Stirling GW - JS

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted]

QUOTE NO: SY/139/19 B

SAMPLER MOBILE: [redacted] / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES 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	WA OMP Water Suite WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
001	0089_MW224		13/12/2023 08:54 AM	WATER	ALS: 5 Non ALS: 0	No	X		
002	0089_MW282		13/12/2023 09:08 AM	WATER	ALS: 5 Non ALS: 0	No	X		
003	0089_MW220		13/12/2023 09:28 AM	WATER	ALS: 3 Non ALS: 0	No	X		
004	0089_MW217		13/12/2023 09:41 AM	WATER	ALS: 3 Non ALS: 0	No	X		
005	0089_QC118		13/12/2023 09:41 AM	WATER	ALS: 3 Non ALS: 0	No	X		
006	0089_MW236		13/12/2023 12:27 PM	WATER	ALS: 3 Non ALS: 0	No	X		

CHAIN OF CUSTODY

COC#: 61534 *ALS Laboratory:* EP Perth Environmental

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

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP_23

SITE: Stirling GW - JS

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO:

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	0089_MW224	HDPE (no PTFE)	20 mL	00352309068008	Grey	No	
001	0089_MW224	HDPE (no PTFE)	20 mL	00352309068026	Grey	No	
001	0089_MW224	Clear Plastic Bottle - Natural	125 mL	00070522229856	Green	No	
001	0089_MW224	HDPE (no PTFE)	20 mL	00350822058847	Grey	No	
001	0089_MW224	HDPE (no PTFE)	20 mL	00350822058907	Grey	No	
002	0089_MW282	Clear Plastic Bottle - Natural	125 mL	00070522229914	Green	No	
002	0089_MW282	HDPE (no PTFE)	20 mL	00352309068180	Grey	No	
002	0089_MW282	HDPE (no PTFE)	20 mL	00352309068027	Grey	No	
002	0089_MW282	HDPE (no PTFE)	20 mL	00351221005927	Grey	No	
002	0089_MW282	HDPE (no PTFE)	20 mL	00350822058844	Grey	No	
003	0089_MW220	Clear Plastic Bottle - Natural	125 mL	00070522229570	Green	No	
003	0089_MW220	HDPE (no PTFE)	20 mL	00352309067919	Grey	No	
003	0089_MW220	HDPE (no PTFE)	20 mL	00352309067907	Grey	No	
004	0089_MW217	Clear Plastic Bottle - Natural	125 mL	00070522229652	Green	No	
004	0089_MW217	HDPE (no PTFE)	20 mL	00352309068149	Grey	No	
004	0089_MW217	HDPE (no PTFE)	20 mL	00352309067952	Grey	No	
005	0089_QC118	Clear Plastic Bottle - Natural	125 mL	00070522229897	Green	No	
005	0089_QC118	HDPE (no PTFE)	20 mL	00352309068110	Grey	No	
005	0089_QC118	HDPE (no PTFE)	20 mL	00352309068002	Grey	No	
006	0089_MW236	Clear Plastic Bottle - Natural	125 mL	00070522229861	Green	No	
006	0089_MW236	HDPE (no PTFE)	20 mL	00352309068262	Grey	No	
006	0089_MW236	HDPE (no PTFE)	20 mL	00352309067964	Grey	No	

Total Bottle Count: ALS: 22, Non ALS: 0

SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : **EP2317849**

Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: Customer Services EP
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
E-mail	: [redacted]stantec.com	E-mail	: ALSEnviro.Perth@alsglobal.com
Telephone	: ----	Telephone	: +61-8-9406 1301
Facsimile	: ----	Facsimile	: +61-8-9406 1399
Project	: WA_0089_PFASOMP_23	Page	: 1 of 2
Order number	: pfas-omp/Stirling	Quote number	: ES2022MWHAUS0002 (SY/139/19 B)
C-O-C number	: 61534	QC Level	: NEPM 2013 B3 & ALS QC Standard
Site	: Stirling GW - JS		
Sampler	: [redacted]		

Dates

Date Samples Received	: 13-Dec-2023 17:00	Issue Date	: 16-Dec-2023
Client Requested Due Date	: 22-Dec-2023	Scheduled Reporting Date	: **22-Dec-2023**

Delivery Details

Mode of Delivery	: Carrier	Security Seal	: Not Available
No. of coolers/boxes	: 2	Temperature	: 6.7 - Ice present
Receipt Detail	:	No. of samples received / analysed	: 6 / 6

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 see scanned COC for sample discrepencies: extra samples , samples not received etc.
- Please direct any queries related to sample condition / numbering / breakages to Sample Receipt (Samples.Perth@alsglobal.com)
- Analytical work for this work order will be conducted at ALS Environmental Perth.
- Please direct any turnaround / technical queries to the laboratory contact designated above.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months) from receipt of samples.
- **pH analysis should be conducted within 6 hours of sampling.**
- **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.**
- 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)	WATER - NT-01 & 02 Ca, Mg, Na, K, Cl, SO4, Alkalinity
EP2317849-001	13-Dec-2023 08:54	0089_MW224_231213	✓	✓
EP2317849-002	13-Dec-2023 09:08	0089_MW282_231213	✓	✓
EP2317849-003	13-Dec-2023 09:28	0089_MW220_231213	✓	✓
EP2317849-004	13-Dec-2023 09:41	0089_MW217_231213	✓	✓
EP2317849-005	13-Dec-2023 09:41	0089_QC118_231213	✓	✓
EP2317849-006	13-Dec-2023 12:27	0089_MW236_231213	✓	✓

Proactive Holding Time Report

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

Requested Deliverables

[redacted]
- A4 - AU Tax Invoice (INV) — Email — [redacted]cardno.com.au

DERP LAB REPORTS
- EDI Format - ESDAT (ESDAT) — Email — derp.labreports@esdat.com.au

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

CERTIFICATE OF ANALYSIS

Work Order	: **EP2317849**	Page	: 1 of 9
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: Customer Services EP
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: +61-8-9406 1301
Project	: WA_0089_PFASOMP_23	Date Samples Received	: 13-Dec-2023 17:00
Order number	: pfas-omp/Stirling	Date Analysis Commenced	: 19-Dec-2023
C-O-C number	: 61534	Issue Date	: 22-Dec-2023 17:09
Sampler	: [redacted] [redacted]		
Site	: Stirling GW - JS		
Quote number	: SY/139/19 B		
No. of samples received	: 6		
No. of samples analysed	: 6		

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]	Inorganics Supervisor	Perth Inorganics, Wangara, WA
[redacted]	Senior Organic Chemist	Perth Organics, Wangara, WA

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.
- As per QWI – EN55-3 Data Interpreting Procedures, Ionic balances are typically calculated using Major Anions - Chloride, Alkalinity and Sulfate; and Major Cations - Calcium, Magnesium, Potassium and Sodium. Where applicable and dependent upon sample matrix, the Ionic Balance may also include the additional contribution of Ammonia, Dissolved Metals by ICPMS and H+ to the Cations and Nitrate, SiO2 and Fluoride to the Anions.
- Ionic Balance out of acceptable limits for sample #1, 4 and 5 due to analytes not quantified in this report. Major cations (ED093F) and major anion (ED037-P) have been confirmed by re-analysis. Scrutinise results accordingly.
- Sodium Adsorption Ratio (where reported): Where results for Na, Ca or Mg are <LOR, a concentration at half the reported LOR is incorporated into the SAR calculation. This represents a conservative approach for Na relative to the assumption that <LOR = zero concentration and a conservative approach for Ca & Mg relative to the assumption that <LOR is equivalent to the LOR concentration.
- 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.
- ED045G: The presence of Thiocyanate, Thiosulfate and Sulfite can positively contribute to the chloride result, thereby may bias results higher than expected. Results should be scrutinised accordingly.

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW224_231213	0089_MW282_231213	0089_MW220_231213	0089_MW217_231213	0089_QC118_231213
				Sampling date / time	13-Dec-2023 08:54	13-Dec-2023 09:08	13-Dec-2023 09:28	13-Dec-2023 09:41	13-Dec-2023 09:41
Compound	CAS Number	LOR	Unit		EP2317849-001	EP2317849-002	EP2317849-003	EP2317849-004	EP2317849-005
					Result	Result	Result	Result	Result
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	<1	<1	<1	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	<1	<1	<1	<1
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		526	462	254	1190	1480
Total Alkalinity as CaCO3	---	1	mg/L		526	462	254	1190	1480
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		40	30	19	24	27
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		107	62	99	34	32
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		58	185	107	116	107
Magnesium	7439-95-4	1	mg/L		25	25	15	15	14
Sodium	7440-23-5	1	mg/L		101	38	39	31	30
Potassium	7440-09-7	1	mg/L		6	10	7	8	8
EN055: Ionic Balance									
ø Total Anions	---	0.01	meq/L		14.4	11.6	8.26	25.2	31.0
ø Total Cations	---	0.01	meq/L		9.50	13.2	8.45	8.58	8.00
ø Ionic Balance	---	0.01	%		20.4	6.42	1.11	49.3	59.0
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		<0.02	1.29	0.04	<0.02	<0.02
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		<0.02	5.68	0.03	<0.02	<0.02
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		<0.01	28.8	0.29	0.04	0.09
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		<0.02	4.98	0.05	<0.02	<0.02
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		<0.01	62.8	4.31	0.29	0.40
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW224_231213	0089_MW282_231213	0089_MW220_231213	0089_MW217_231213	0089_QC118_231213
				Sampling date / time	13-Dec-2023 08:54	13-Dec-2023 09:08	13-Dec-2023 09:28	13-Dec-2023 09:41	13-Dec-2023 09:41
Compound	CAS Number	LOR	Unit		EP2317849-001	EP2317849-002	EP2317849-003	EP2317849-004	EP2317849-005
					Result	Result	Result	Result	Result
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		<0.1	**0.6**	<0.1	**1.5**	**1.4**
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		<0.02	**0.75**	**0.08**	**5.70**	**5.22**
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		<0.02	**6.23**	**0.11**	**5.91**	**5.92**
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		<0.02	**1.98**	**0.04**	**0.86**	**0.89**
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		<0.01	**4.14**	**0.05**	**0.34**	**0.34**
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
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									

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW224_231213	0089_MW282_231213	0089_MW220_231213	0089_MW217_231213	0089_QC118_231213
				Sampling date / time	13-Dec-2023 08:54	13-Dec-2023 09:08	13-Dec-2023 09:28	13-Dec-2023 09:41	13-Dec-2023 09:41
Compound	CAS Number	LOR	Unit		EP2317849-001	EP2317849-002	EP2317849-003	EP2317849-004	EP2317849-005
					Result	Result	Result	Result	Result
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
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	**21.4**	**24.8**
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		<0.05	<0.05	<0.05	**0.29**	**0.28**
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	**117**	**5.00**	**36.3**	**39.3**
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		<0.01	**91.6**	**4.60**	**0.33**	**0.49**
Sum of PFAS (WA DER List)	---	0.01	µg/L		<0.01	**106**	**4.92**	**36.3**	**39.3**
EP231S: PFAS Surrogate									
13C4-PFOS	---	0.02	%		**88.4**	**80.5**	**97.1**	**97.3**	**92.6**
13C8-PFOA	---	0.02	%		**104**	**101**	**99.6**	**102**	**101**

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW236_231213	----	----	----	----
				Sampling date / time	13-Dec-2023 12:27	----	----	----	----
Compound	CAS Number	LOR	Unit	EP2317849-006	--------	--------	--------	--------	
				Result	—	—	—	—	
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	----	----	----	----	
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	----	----	----	----	
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	281	----	----	----	----	
Total Alkalinity as CaCO3	----	1	mg/L	281	----	----	----	----	
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	17	----	----	----	----	
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L	28	----	----	----	----	
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L	92	----	----	----	----	
Magnesium	7439-95-4	1	mg/L	17	----	----	----	----	
Sodium	7440-23-5	1	mg/L	23	----	----	----	----	
Potassium	7440-09-7	1	mg/L	<1	----	----	----	----	
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L	6.76	----	----	----	----	
ø Total Cations	----	0.01	meq/L	6.99	----	----	----	----	
ø Ionic Balance	----	0.01	%	1.69	----	----	----	----	
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	0.28	----	----	----	----	
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	0.46	----	----	----	----	
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	11.8	----	----	----	----	
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	0.47	----	----	----	----	
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	57.5	----	----	----	----	
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	----	----	----	----	

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW236_231213	----	----	----	----
				Sampling date / time	13-Dec-2023 12:27	---	---	---	---
Compound	CAS Number	LOR	Unit		EP2317849-006	--------	--------	--------	--------
					Result	---	---	---	---
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		**0.10**	----	----	----	----
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		**0.76**	----	----	----	----
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		**0.20**	----	----	----	----
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		**1.29**	----	----	----	----
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		**2.38**	----	----	----	----
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	----	----	----	----
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									

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW236_231213	----	----	----	----
				Sampling date / time	13-Dec-2023 12:27	---	---	---	---
Compound	CAS Number	LOR	Unit		EP2317849-006	--------	--------	--------	--------
					Result	---	---	---	---
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
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		**75.2**	----	----	----	----
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		**69.3**	----	----	----	----
Sum of PFAS (WA DER List)	---	0.01	µg/L		**71.9**	----	----	----	----
EP231S: PFAS Surrogate									
13C4-PFOS	---	0.02	%		**86.9**	----	----	----	----
13C8-PFOA	---	0.02	%		**112**	----	----	----	----

Surrogate Control Limits

Sub-Matrix: GROUNDWATER		Recovery Limits (%)	
Compound	CAS Number	Low	High
EP231S: PFAS Surrogate			
13C4-PFOS	---	65	140
13C8-PFOA	---	71	133

QUALITY CONTROL REPORT

Work Order	: **EP2317849**	Page	: 1 of 9
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: Customer Services EP
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: +61-8-9406 1301
Project	: WA_0089_PFASOMP_23	Date Samples Received	: 13-Dec-2023
Order number	: pfas-omp/Stirling	Date Analysis Commenced	: 19-Dec-2023
C-O-C number	: 61534	Issue Date	: 22-Dec-2023
Sampler	: [redacted] [redacted]		
Site	: Stirling GW - JS		
Quote number	: SY/139/19 B		
No. of samples received	: 6		
No. of samples analysed	: 6		

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]	Inorganics Supervisor	Perth Inorganics, Wangara, WA
[redacted]	Senior Organic Chemist	Perth Organics, Wangara, WA

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 (%)*
ED037P: Alkalinity by PC Titrator (QC Lot: 5505356)									
EP2317849-002	0089_MW282_231213	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	462	468	1.3	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	462	468	1.3	0% - 20%
EP2317850-005	Anonymous	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	124	123	0.0	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	124	123	0.0	0% - 20%
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QC Lot: 5501011)									
EP2317729-001	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	204	195	4.2	0% - 20%
EP2317756-007	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	2620	2630	0.4	0% - 20%
ED045G: Chloride by Discrete Analyser (QC Lot: 5501012)									
EP2317729-001	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	1940	1900	2.3	0% - 20%
EP2317756-007	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	17900	17900	0.3	0% - 20%
ED093F: Dissolved Major Cations (QC Lot: 5500565)									
EP2317849-001	0089_MW224_231213	ED093F: Calcium	7440-70-2	1	mg/L	58	59	0.0	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	25	22	12.1	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	101	84	18.9	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	6	4	30.9	No Limit
EP2317877-009	Anonymous	ED093F Calcium	7440-70-2	1	mg/L	268	256	4.5	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	486	486	0.0	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	1580	1580	0.1	0% - 20%

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 (%)
ED093F: Dissolved Major Cations (QC Lot: 5500565) - continued									
EP2317877-009	Anonymous	ED093F: Potassium	7440-09-7	1	mg/L	8	8	0.0	No Limit
ED093F: Dissolved Major Cations (QC Lot: 5500583)									
EP2317690-004	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	682	635	7.2	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	1840	1720	7.0	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	14600	13500	7.3	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	734	678	7.9	0% - 20%
EP2317850-002	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	481	460	4.4	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	1460	1450	0.6	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	11600	11400	1.2	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	570	565	0.9	0% - 20%
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 5503827)									
EP2317700-011	Anonymous	EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	0.05	0.04	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	0.12	0.11	11.1	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
EP2317849-002	0089_MW282_231213	EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	28.8	32.1	10.7	0% - 20%
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	62.8	69.7	10.4	0% - 20%
		EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	1.29	1.24	3.6	0% - 20%
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	5.68	6.29	10.2	0% - 20%
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	4.98	5.47	9.5	0% - 20%
		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: 5503827)									
EP2317700-011	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
EP2317849-002	0089_MW282_231213	EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	4.14	4.17	0.9	0% - 20%
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	0.75	0.77	2.4	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 (%)*
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 5503827) - continued									
EP2317849-002	0089_MW282_231213	EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	6.23	6.27	0.6	0% - 20%
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	1.98	1.87	5.7	0% - 20%
		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	0.6	0.6	0.0	No Limit
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 5503827)									
EP2317700-011	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
EP2317849-002	0089_MW282_231213	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: 5503827)									
EP2317700-011	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

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: 5503827) - continued									
EP2317700-011	Anonymous	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
EP2317849-002	0089_MW282_231213	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: 5503827)									
EP2317700-011	Anonymous	EP231X: Sum of PFAS	----	0.01	µg/L	0.17	0.15	12.5	0% - 50%
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	0.17	0.15	12.5	0% - 50%
		EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	0.17	0.15	12.5	0% - 50%
EP2317849-002	0089_MW282_231213	EP231X: Sum of PFAS	----	0.01	µg/L	117	128	9.1	0% - 20%
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	91.6	102	10.5	0% - 20%
		EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	106	117	9.1	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
ED037P: Alkalinity by PC Titrator (QCLot: 5505356)								
ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	---	---	---	---
ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	---	---	---	---
ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	<1	---	---	---	---
ED037-P: Total Alkalinity as CaCO3	---	1	mg/L	<1	20 mg/L	96.8	85.1	126
				<1	200 mg/L	92.0	90.5	111
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 5501011)								
ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<1	25 mg/L	96.9	89.9	112
				<1	500 mg/L	100.0	89.9	112
ED045G: Chloride by Discrete Analyser (QCLot: 5501012)								
ED045G: Chloride	16887-00-6	1	mg/L	<1	10 mg/L	100	88.6	113
				<1	1000 mg/L	101	88.6	113
ED093F: Dissolved Major Cations (QCLot: 5500565)								
ED093F: Calcium	7440-70-2	1	mg/L	<1	50 mg/L	90.0	86.5	117
ED093F: Magnesium	7439-95-4	1	mg/L	<1	50 mg/L	88.4	88.4	110
ED093F: Sodium	7440-23-5	1	mg/L	<1	50 mg/L	92.5	91.4	113
ED093F: Potassium	7440-09-7	1	mg/L	<1	50 mg/L	93.8	84.6	108
ED093F: Dissolved Major Cations (QCLot: 5500583)								
ED093F: Calcium	7440-70-2	1	mg/L	<1	50 mg/L	102	86.5	117
ED093F: Magnesium	7439-95-4	1	mg/L	<1	50 mg/L	102	88.4	110
ED093F: Sodium	7440-23-5	1	mg/L	<1	50 mg/L	106	91.4	113
ED093F: Potassium	7440-09-7	1	mg/L	<1	50 mg/L	99.5	84.6	108
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5503827)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.2218 µg/L	98.7	72.0	130
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.2352 µg/L	117	71.0	127
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	0.2373 µg/L	98.0	68.0	131
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.238 µg/L	105	69.0	134
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.232 µg/L	92.2	65.0	140
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.241 µg/L	89.4	53.0	142
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5503827)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	1.25 µg/L	105	73.0	129

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: 5503827) - continued								
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	0.25 µg/L	88.6	72.0	129
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	0.25 µg/L	112	72.0	129
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	0.25 µg/L	103	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	109	69.0	130
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	0.25 µg/L	87.0	71.0	129
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	0.25 µg/L	97.0	69.0	133
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	0.25 µg/L	93.0	72.0	134
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	0.25 µg/L	88.2	65.0	144
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	0.25 µg/L	102	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5503827)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.25 µg/L	74.8	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	0.625 µg/L	108	68.0	141
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	0.625 µg/L	90.2	60.5	138
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	0.625 µg/L	103	68.3	134
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	0.625 µg/L	96.1	62.2	138
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	0.25 µg/L	91.2	65.0	136
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	0.25 µg/L	122	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5503827)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.2343 µg/L	116	63.0	143
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	0.2378 µg/L	107	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	0.24 µg/L	115	67.0	138
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	0.241 µg/L	96.3	64.2	133
EP231P: PFAS Sums (QCLot: 5503827)								
EP231X: Sum of PFAS	---	0.01	µg/L	<0.01	---	---	---	---
EP231X: Sum of PFHxS and PFOS	355-46-4/17 63-23-1	0.01	µg/L	<0.01	---	---	---	---
EP231X: Sum of PFAS (WA DER List)	---	0.01	µg/L	<0.01	---	---	---	---

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**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 5501011)							
EP2317729-001	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	100 mg/L	114	70.4	130
ED045G: Chloride by Discrete Analyser (QCLot: 5501012)							
EP2317729-001	Anonymous	ED045G: Chloride	16887-00-6	200 mg/L	# Not Determined	70.0	130
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5503827)							
EP2317849-001	0089_MW224_231213	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.2218 µg/L	97.3	72.0	129
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.232 µg/L	122	71.0	127
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.2352 µg/L	109	68.0	129
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.238 µg/L	110	69.0	134
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.232 µg/L	92.1	65.0	140
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.241 µg/L	91.3	53.0	129
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5503827)							
EP2317849-001	0089_MW224_231213	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	1.25 µg/L	102	73.0	142
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.25 µg/L	104	72.0	129
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.25 µg/L	111	72.0	129
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.25 µg/L	108	72.0	130
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.25 µg/L	114	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	92.0	71.0	134
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.25 µg/L	103	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	118	65.0	144
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.25 µg/L	115	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5503827)							
EP2317849-001	0089_MW224_231213	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.25 µg/L	75.2	59.0	135
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.625 µg/L	124	70.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.625 µg/L	93.4	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.625 µg/L	89.8	70.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.625 µg/L	105	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.25 µg/L	87.4	65.0	136
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.25 µg/L	114	61.0	135

Sub-Matrix: **WATER**

Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report: Spike Concentration	Matrix Spike (MS) Report: SpikeRecovery(%) MS	Matrix Spike (MS) Report: Acceptable Limits (%) Low	Matrix Spike (MS) Report: Acceptable Limits (%) High
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5503827)							
EP2317849-001	0089_MW224_231213	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.234 µg/L	114	63.0	143
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.2378 µg/L	111	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.24 µg/L	106	67.0	138
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.2415 µg/L	90.2	70.0	130

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **EP2317849**	Page	: 1 of 5
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Telephone	: +61-8-9406 1301
Project	: WA_0089_PFASOMP_23	Date Samples Received	: 13-Dec-2023
Site	: Stirling GW - JS	Issue Date	: 22-Dec-2023
Sampler	: [redacted]	No. of samples received	: 6
Order number	: pfas-omp/Stirling	No. of samples analysed	: 6

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.**
- **Matrix Spike outliers exist - please see following pages for full details.**
- **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.**

Outliers : Quality Control Samples

Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

Matrix: **WATER**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
Matrix Spike (MS) Recoveries							
ED045G: Chloride by Discrete Analyser	EP2317729--001	Anonymous	**Chloride**	16887-00-6	Not Determined	---	**MS recovery not determined, background level greater than or equal to 4x spike level.**

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
ED037P: Alkalinity by PC Titrator							
Clear Plastic Bottle - Natural (ED037-P)							
0089_MW224_231213, 0089_MW220_231213, 0089_QC118_231213, 0089_MW282_231213, 0089_MW217_231213, 0089_MW236_231213	**13-Dec-2023**	---	---	---	**20-Dec-2023**	27-Dec-2023	✓
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA							
Clear Plastic Bottle - Natural (ED041G)							
0089_MW224_231213, 0089_MW220_231213, 0089_QC118_231213, 0089_MW282_231213, 0089_MW217_231213, 0089_MW236_231213	**13-Dec-2023**	---			**22-Dec-2023**	10 Jan 2024	✓
ED045G: Chloride by Discrete Analyser							
Clear Plastic Bottle - Natural (ED045G)							
0089 MW224 231213, 0089 MW220 231213, 0089 QC118 231213, 0089 MW282 231213, 0089 MW217 231213, 0089 MW236 231213	**13-Dec-2023**	---	---	---	**22-Dec-2023**	10-Jan-2024	✓
ED093F: Dissolved Major Cations							
Clear Plastic Bottle - Natural (ED093F)							
0089_MW224_231213, 0089_MW220_231213, 0089_MW282_231213,	**13-Dec-2023**	---	---	---	**19-Dec-2023**	20-Dec-2023	✓
Clear Plastic Bottle - Natural (ED093F)							
0089_MW217_231213, 0089_MW236_231213, 0089_QC118_231213,	**13-Dec-2023**	---	---	---	**20-Dec-2023**	20-Dec-2023	✓

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)								
0089_MW224_231213,	0089_MW282_231213,	**13-Dec-2023**	**19-Dec-2023**	10-Jun-2024	✓	**19-Dec-2023**	10-Jun-2024	✓
0089_MW220_231213,	0089_MW217_231213,							
0089_QC118_231213,	0089_MW236_231213							
EP231B: Perfluoroalkyl Carboxylic Acids								
HDPE (no PTFE) (EP231X)								
0089_MW224_231213,	0089_MW282_231213,	**13-Dec-2023**	**19-Dec-2023**	10-Jun-2024	✓	**19-Dec-2023**	10-Jun-2024	✓
0089_MW220_231213,	0089_MW217_231213,							
0089_QC118_231213,	0089_MW236_231213							
EP231C: Perfluoroalkyl Sulfonamides								
HDPE (no PTFE) (EP231X)								
0089_MW224_231213,	0089_MW282_231213,	**13-Dec-2023**	**19-Dec-2023**	10-Jun-2024	✓	**19-Dec-2023**	10-Jun-2024	✓
0089_MW220_231213,	0089_MW217_231213,							
0089_QC118_231213,	0089_MW236_231213							
EP231D: (n:2) Fluorotelomer Sulfonic Acids								
HDPE (no PTFE) (EP231X)								
0089_MW224_231213,	0089_MW282_231213,	**13-Dec-2023**	**19-Dec-2023**	10-Jun-2024	✓	**19-Dec-2023**	10-Jun-2024	✓
0089_MW220_231213,	0089_MW217_231213,							
0089_QC118_231213,	0089_MW236_231213							
EP231P: PFAS Sums								
HDPE (no PTFE) (EP231X)								
0089_MW224_231213,	0089_MW282_231213,	**13-Dec-2023**	**19-Dec-2023**	10-Jun-2024	✓	**19-Dec-2023**	10-Jun-2024	✓
0089_MW220_231213,	0089_MW217_231213,							
0089_QC118_231213,	0089_MW236_231213							

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)							
Alkalinity by Auto Titrator	ED037-P	2	12	**16.67**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	4	33	**12.12**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Alkalinity by Auto Titrator	ED037-P	2	12	**16.67**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	2	33	**6.06**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Alkalinity by Auto Titrator	ED037-P	1	12	**8.33**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	2	33	**6.06**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Chloride by Discrete Analyser	ED045G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	20	**5.00**	**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
Alkalinity by Auto Titrator	ED037-P	WATER	In house: Referenced to APHA 2320 B This procedure determines alkalinity by automated measurement (e.g. PC Titrate) on a settled supernatant aliquot of the sample using pH 4.5 for indicating the total alkalinity end-point. This method is compliant with NEPM Schedule B(3)
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	WATER	In house: Referenced to APHA 4500-SO4. Dissolved sulfate is determined in a 0.45um filtered sample. Sulfate ions are converted to a barium sulfate suspension in an acetic acid medium with barium chloride. Light absorbance of the BaSO4 suspension is measured by a photometer and the SO4-2 concentration is determined by comparison of the reading with a standard curve. This method is compliant with NEPM Schedule B(3)
Chloride by Discrete Analyser	ED045G	WATER	In house: Referenced to APHA 4500 Cl - G.The thiocyanate ion is liberated from mercuric thiocyanate through sequestration of mercury by the chloride ion to form non-ionised mercuric chloride. In the presence of ferric ions the liberated thiocynate forms highly-coloured ferric thiocynate which is measured at 480 nm.
Major Cations - Dissolved	ED093F	WATER	In house: Referenced to APHA 3120 and 3125; USEPA SW 846 - 6010 and 6020; Cations are determined by either ICP-AES or ICP-MS techniques. This method is compliant with NEPM Schedule B(3) Sodium Adsorption Ratio is calculated from Ca, Mg and Na which determined by ALS in house method QWI-EN/ED093F. This method is compliant with NEPM Schedule B(3) Hardness parameters are calculated based on APHA 2340 B. This method is compliant with NEPM Schedule B(3)
Ionic Balance by PCT DA and Turbi SO4 DA	* EN055 - PG	WATER	In house: Referenced to APHA 1030F. This method is compliant with NEPM Schedule B(3)
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.

ALSCompass
SAMPLING *Intelligence*

ALS

Environmental Division
Perth
Work Order Reference
EP2317850

Telephone +61-8-9406 1301

Custody Document for Submissions via ALS Compass App

Project: WA_00594_PFASDMP_23 **Client:** Stantec **Project Manager:** [redacted]

ALS Compass COC Reference: 61564; 61565; 61534; 61532; 61516; 61525; 61521; 61520; 61533 **# Samples:** 2 Eskies **Sampler:** [redacted]

Turnaround Requirements: Standard _____ Urgent _____ **Phone:** [redacted]

Special Instructions:

Custody:

Relinquished by:	Received by:	Relinquished by:	Received by:
[redacted]	[redacted]		
Date / Time: 8/12/23	Date / Time: 13/12@1700.	Date / Time:	Date / Time:

CHAIN OF CUSTODY

COC#: **61565** *ALS Laboratory:* EP Perth Environmental

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

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP_23

SITE: Stirling SW/PW - JS

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted]

QUOTE NO: SY/139/19 B

SAMPLER MOBILE: [redacted] / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES 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	WA OMP Water Suite WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
001	0089_PW415		13/12/2023 10:31 AM	WATER	ALS: 3 Non ALS: 0	No	X		
002	0089_PW413		13/12/2023 10:32 AM	WATER	ALS: 3 Non ALS: 0	No	X		
003	0089_PW411		13/12/2023 10:32 AM	WATER	ALS: 3 Non ALS: 0	No	X		
004	0089_SW412		13/12/2023 10:33 AM	WATER	ALS: 3 Non ALS: 0	No	X		
005	0089_SW414		13/12/2023 10:34 AM	WATER	ALS: 3 Non ALS: 0	No	X		
006	0089_SW416		13/12/2023 10:34 AM	WATER	ALS: 3 Non ALS: 0	No	X		

CHAIN OF CUSTODY

COC#: 61565 *ALS Laboratory:* EP Perth Environmental

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

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP_23

SITE: Stirling SW/PW - JS

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO [redacted]

EMAIL INVOICES 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	0089_PW415	Clear Plastic Bottle - Natural	125 mL	00070522229574	Green	No	
001	0089_PW415	HDPE (no PTFE)	20 mL	00352309068067	Grey	No	
001	0089_PW415	HDPE (no PTFE)	20 mL	00352309068200	Grey	No	
002	0089_PW413	Clear Plastic Bottle - Natural	125 mL	00070522229732	Green	No	
002	0089_PW413	HDPE (no PTFE)	20 mL	00352309068037	Grey	No	
002	0089_PW413	HDPE (no PTFE)	20 mL	00352309068039	Grey	No	
003	0089_PW411	Clear Plastic Bottle - Natural	125 mL	00070522229943	Green	No	
003	0089_PW411	HDPE (no PTFE)	20 mL	00352309068286	Grey	No	
003	0089_PW411	HDPE (no PTFE)	20 mL	00352309068070	Grey	No	
004	0089_SW412	Clear Plastic Bottle - Natural	125 mL	00070522229719	Green	No	
004	0089_SW412	HDPE (no PTFE)	20 mL	00352309068234	Grey	No	
004	0089_SW412	HDPE (no PTFE)	20 mL	00352309068284	Grey	No	
005	0089_SW414	Clear Plastic Bottle - Natural	125 mL	00070522229857	Green	No	
005	0089_SW414	HDPE (no PTFE)	20 mL	00352309067916	Grey	No	
005	0089_SW414	HDPE (no PTFE)	20 mL	00352309068019	Grey	No	
006	0089_SW416	Clear Plastic Bottle - Natural	125 mL	00070522229774	Green	No	
006	0089_SW416	HDPE (no PTFE)	20 mL	00352309068182	Grey	No	
006	0089_SW416	HDPE (no PTFE)	20 mL	00352309068229	Grey	No	

Total Bottle Count: ALS: 18, Non ALS: 0

SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : **EP2317850**

Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: Customer Services EP
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
E-mail	: [redacted]stantec.com	E-mail	: ALSEnviro.Perth@alsglobal.com
Telephone	: ----	Telephone	: +61-8-9406 1301
Facsimile	: ----	Facsimile	: +61-8-9406 1399
Project	: WA_0089_PFASOMP_23	Page	: 1 of 2
Order number	: pfas-omp/Stirling	Quote number	: ES2022MWHAUS0002 (SY/139/19 B)
C-O-C number	: 61565	QC Level	: NEPM 2013 B3 & ALS QC Standard
Site	: Stirling SW/PW - JS		
Sampler	: [redacted]		

Dates

Date Samples Received	: 13-Dec-2023 17:00	Issue Date	: 16-Dec-2023
Client Requested Due Date	: 22-Dec-2023	Scheduled Reporting Date	: **22-Dec-2023**

Delivery Details

Mode of Delivery	: Carrier	Security Seal	: Not Available
No. of coolers/boxes	: 2	Temperature	: 6.7 - Ice present
Receipt Detail	:	No. of samples received / analysed	: 6 / 6

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 see scanned COC for sample discrepencies: extra samples , samples not received etc.
- Please direct any queries related to sample condition / numbering / breakages to Sample Receipt (Samples.Perth@alsglobal.com)
- Analytical work for this work order will be conducted at ALS Environmental Perth.
- Please direct any turnaround / technical queries to the laboratory contact designated above.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months) from receipt of samples.
- **pH analysis should be conducted within 6 hours of sampling.**
- **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.**
- 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)	WATER - NT-01 & 02 Ca, Mg, Na, K, Cl, SO4, Alkalinity
EP2317850-001	13-Dec-2023 10:31	0089_PW415_231213	✓	✓
EP2317850-002	13-Dec-2023 10:32	0089_PW413_231213	✓	✓
EP2317850-003	13-Dec-2023 10:32	0089_PW411_231213	✓	✓
EP2317850-004	13-Dec-2023 10:33	0089_SW412_231213	✓	✓
EP2317850-005	13-Dec-2023 10:34	0089_SW414_231213	✓	✓
EP2317850-006	13-Dec-2023 10:34	0089_SW416_231213	✓	✓

Proactive Holding Time Report

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

Requested Deliverables

[redacted]
- A4 - AU Tax Invoice (INV) — Email — [redacted]cardno.com.au

DERP LAB REPORTS
- EDI Format - ESDAT (ESDAT) — Email — derp.labreports@esdat.com.au

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

CERTIFICATE OF ANALYSIS

Work Order	: **EP2317850**	Page	: 1 of 9
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: Customer Services EP
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: +61-8-9406 1301
Project	: WA_0089_PFASOMP_23	Date Samples Received	: 13-Dec-2023 17:00
Order number	: pfas-omp/Stirling	Date Analysis Commenced	: 19-Dec-2023
C-O-C number	: 61565	Issue Date	: 22-Dec-2023 14:56
Sampler	: [redacted] [redacted]		
Site	: Stirling SW/PW - JS		
Quote number	: SY/139/19 B		
No. of samples received	: 6		
No. of samples analysed	: 6		

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]	Inorganics Supervisor	Perth Inorganics, Wangara, WA
[redacted]	Laboratory Manager (Perth)	Perth Inorganics, Wangara, WA
[redacted]	Senior Organic Chemist	Perth Organics, Wangara, WA

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.
- As per QWI – EN55-3 Data Interpreting Procedures, Ionic balances are typically calculated using Major Anions - Chloride, Alkalinity and Sulfate; and Major Cations - Calcium, Magnesium, Potassium and Sodium. Where applicable and dependent upon sample matrix, the Ionic Balance may also include the additional contribution of Ammonia, Dissolved Metals by ICPMS and H+ to the Cations and Nitrate, SiO2 and Fluoride to the Anions.
- Sodium Adsorption Ratio (where reported): Where results for Na, Ca or Mg are <LOR, a concentration at half the reported LOR is incorporated into the SAR calculation. This represents a conservative approach for Na relative to the assumption that <LOR = zero concentration and a conservative approach for Ca & Mg relative to the assumption that <LOR is equivalent to the LOR concentration.
- 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.
- ED045G: The presence of Thiocyanate, Thiosulfate and Sulfite can positively contribute to the chloride result, thereby may bias results higher than expected. Results should be scrutinised accordingly.

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_PW415_231213	0089_PW413_231213	0089_PW411_231213	0089_SW412_231213	0089_SW414_231213
				Sampling date / time	13-Dec-2023 10:31	13-Dec-2023 10:32	13-Dec-2023 10:32	13-Dec-2023 10:33	13-Dec-2023 10:34
Compound	CAS Number	LOR	Unit		EP2317850-001	EP2317850-002	EP2317850-003	EP2317850-004	EP2317850-005
					Result	Result	Result	Result	Result
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	<1	<1	<1	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	<1	<1	<1	<1
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		133	132	127	136	124
Total Alkalinity as CaCO3	---	1	mg/L		133	132	127	136	124
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		2920	2650	2950	2960	2960
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		20000	19900	20000	20100	20300
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		463	481	452	458	457
Magnesium	7439-95-4	1	mg/L		1460	1460	1440	1460	1460
Sodium	7440-23-5	1	mg/L		11500	11600	11400	11600	11500
Potassium	7440-09-7	1	mg/L		571	570	562	575	570
EN055: Ionic Balance									
ø Total Anions	---	0.01	meq/L		628	619	628	631	637
ø Total Cations	---	0.01	meq/L		658	663	651	662	658
ø Ionic Balance	---	0.01	%		2.37	3.44	1.81	2.39	1.62
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

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_PW415_231213	0089_PW413_231213	0089_PW411_231213	0089_SW412_231213	0089_SW414_231213
				Sampling date / time	13-Dec-2023 10:31	13-Dec-2023 10:32	13-Dec-2023 10:32	13-Dec-2023 10:33	13-Dec-2023 10:34
Compound	CAS Number	LOR	Unit		EP2317850-001	EP2317850-002	EP2317850-003	EP2317850-004	EP2317850-005
					Result	Result	Result	Result	Result
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
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									

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_PW415_231213	0089_PW413_231213	0089_PW411_231213	0089_SW412_231213	0089_SW414_231213
				Sampling date / time	13-Dec-2023 10:31	13-Dec-2023 10:32	13-Dec-2023 10:32	13-Dec-2023 10:33	13-Dec-2023 10:34
Compound	CAS Number	LOR	Unit		EP2317850-001	EP2317850-002	EP2317850-003	EP2317850-004	EP2317850-005
					Result	Result	Result	Result	Result
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
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	%		85.7	83.3	84.7	86.1	95.7
13C8-PFOA	---	0.02	%		96.1	114	93.8	123	122

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_SW416_231213	----	----	----	----
				Sampling date / time	13-Dec-2023 10:34	---	---	---	---
Compound	CAS Number	LOR	Unit	EP2317850-006	--------	--------	--------	--------	
				Result	---	---	---	---	
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	----	----	----	----	
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	----	----	----	----	
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	115	----	----	----	----	
Total Alkalinity as CaCO3	----	1	mg/L	115	----	----	----	----	
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	2970	----	----	----	----	
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L	20300	----	----	----	----	
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L	458	----	----	----	----	
Magnesium	7439-95-4	1	mg/L	1470	----	----	----	----	
Sodium	7440-23-5	1	mg/L	11600	----	----	----	----	
Potassium	7440-09-7	1	mg/L	580	----	----	----	----	
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L	637	----	----	----	----	
ø Total Cations	----	0.01	meq/L	663	----	----	----	----	
ø Ionic Balance	----	0.01	%	2.04	----	----	----	----	
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	----	----	----	----	

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_SW416_231213	----	----	----	----
				Sampling date / time	13-Dec-2023 10:34	---	---	---	---
Compound	CAS Number	LOR	Unit		EP2317850-006	--------	--------	--------	--------
					Result	---	---	---	---
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	----	----	----	----
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									

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_SW416_231213	----	----	----	----
				Sampling date / time	13-Dec-2023 10:34	---	---	---	---
Compound	CAS Number	LOR	Unit		EP2317850-006	--------	--------	--------	--------
					Result	---	---	---	---
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
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	%		**105**	----	----	----	----
13C8-PFOA	---	0.02	%		**117**	----	----	----	----

Surrogate Control Limits

Sub-Matrix: SURFACE WATER		Recovery Limits (%)	
Compound	CAS Number	Low	High
EP231S: PFAS Surrogate			
13C4-PFOS	---	65	140
13C8-PFOA	---	71	133

QUALITY CONTROL REPORT

Work Order	: **EP2317850**	Page	: 1 of 11
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: Customer Services EP
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: +61-8-9406 1301
Project	: WA_0089_PFASOMP_23	Date Samples Received	: 13-Dec-2023
Order number	: pfas-omp/Stirling	Date Analysis Commenced	: 19-Dec-2023
C-O-C number	: 61565	Issue Date	: 22-Dec-2023
Sampler	: [redacted] [redacted]		
Site	: Stirling SW/PW - JS		
Quote number	: SY/139/19 B		
No. of samples received	: 6		
No. of samples analysed	: 6		

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]	Inorganics Supervisor	Perth Inorganics, Wangara, WA
[redacted]	Laboratory Manager (Perth)	Perth Inorganics, Wangara, WA
[redacted]	Senior Organic Chemist	Perth Organics, Wangara, WA

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 (%)
ED037P: Alkalinity by PC Titrator (QC Lot: 5505356)									
EP2317849-002	Anonymous	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	462	468	1.3	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	462	468	1.3	0% - 20%
EP2317850-005	0089_SW414_231213	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	124	123	0.0	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	124	123	0.0	0% - 20%
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QC Lot: 5501016)									
EP2317690-001	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	2650	2690	1.7	0% - 20%
EP2317701-004	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	2730	2730	0.0	0% - 20%
ED045G: Chloride by Discrete Analyser (QC Lot: 5501017)									
EP2317690-001	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	22500	22400	0.5	0% - 20%
EP2317701-004	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	19500	19600	0.3	0% - 20%
ED093F: Dissolved Major Cations (QC Lot: 5500583)									
EP2317690-004	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	682	635	7.2	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	1840	1720	7.0	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	14600	13500	7.3	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	734	678	7.9	0% - 20%
EP2317850-002	0089_PW413_231213	ED093F Calcium	7440-70-2	1	mg/L	481	460	4.4	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	1460	1450	0.6	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	11600	11400	1.2	0% - 20%

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 (%)
ED093F: Dissolved Major Cations (QC Lot: 5500583) - continued									
EP2317850-002	0089_PW413_231213	ED093F: Potassium	7440-09-7	1	mg/L	570	565	0.9	0% - 20%
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 5503827)									
EP2317700-011	Anonymous	EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	0.05	0.04	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	0.12	0.11	11.1	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
EP2317849-002	Anonymous	EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	28.8	32.1	10.7	0% - 20%
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	62.8	69.7	10.4	0% - 20%
		EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	1.29	1.24	3.6	0% - 20%
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	5.68	6.29	10.2	0% - 20%
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	4.98	5.47	9.5	0% - 20%
		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: 5503827)									
EP2317700-011	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
EP2317849-002	Anonymous	EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	4.14	4.17	0.9	0% - 20%
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	0.75	0.77	2.4	0% - 20%
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	6.23	6.27	0.6	0% - 20%
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	1.98	1.87	5.7	0% - 20%
		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	0.6	0.6	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: 5503827)									
EP2317700-011	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
EP2317849-002	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: 5503827)									
EP2317700-011	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
EP2317849-002	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

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: 5503827) - continued									
EP2317849-002	Anonymous	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: 5503827)									
EP2317700-011	Anonymous	EP231X: Sum of PFAS	----	0.01	µg/L	0.17	0.15	12.5	0% - 50%
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	0.17	0.15	12.5	0% - 50%
		EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	0.17	0.15	12.5	0% - 50%
EP2317849-002	Anonymous	EP231X: Sum of PFAS	----	0.01	µg/L	117	128	9.1	0% - 20%
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	91.6	102	10.5	0% - 20%
		EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	106	117	9.1	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
ED037P: Alkalinity by PC Titrator (QCLot: 5505356)								
ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	---	---	---	---
ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	---	---	---	---
ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	<1	---	---	---	---
ED037-P: Total Alkalinity as CaCO3	---	1	mg/L	<1	20 mg/L	96.8	85.1	126
				<1	200 mg/L	92.0	90.5	111
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 5501016)								
ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<1	25 mg/L	97.3	89.9	112
				<1	500 mg/L	103	89.9	112
ED045G: Chloride by Discrete Analyser (QCLot: 5501017)								
ED045G: Chloride	16887-00-6	1	mg/L	<1	10 mg/L	97.3	88.6	113
				<1	1000 mg/L	98.6	88.6	113
ED093F: Dissolved Major Cations (QCLot: 5500583)								
ED093F: Calcium	7440-70-2	1	mg/L	<1	50 mg/L	102	86.5	117
ED093F: Magnesium	7439-95-4	1	mg/L	<1	50 mg/L	102	88.4	110
ED093F: Sodium	7440-23-5	1	mg/L	<1	50 mg/L	106	91.4	113
ED093F: Potassium	7440-09-7	1	mg/L	<1	50 mg/L	99.5	84.6	108
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5503827)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.2218 µg/L	98.7	72.0	130
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.2352 µg/L	117	71.0	127
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	0.2373 µg/L	98.0	68.0	131
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.238 µg/L	105	69.0	134
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.232 µg/L	92.2	65.0	140
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.241 µg/L	89.4	53.0	142
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5503828)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.2218 µg/L	97.8	72.0	130
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.2352 µg/L	102	71.0	127
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	0.2373 µg/L	91.9	68.0	131
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.238 µg/L	102	69.0	134
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.232 µg/L	96.8	65.0	140
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.241 µg/L	96.7	53.0	142

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
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5503841)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.2218 µg/L	93.6	72.0	130
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.2352 µg/L	111	71.0	127
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	0.2373 µg/L	98.4	68.0	131
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.238 µg/L	101	69.0	134
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.232 µg/L	98.9	65.0	140
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.241 µg/L	86.1	53.0	142
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5503827)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	1.25 µg/L	105	73.0	129
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	0.25 µg/L	88.6	72.0	129
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	0.25 µg/L	112	72.0	129
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	0.25 µg/L	103	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	109	69.0	130
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	0.25 µg/L	87.0	71.0	129
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	0.25 µg/L	97.0	69.0	133
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	0.25 µg/L	93.0	72.0	134
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	0.25 µg/L	88.2	65.0	144
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	0.25 µg/L	102	71.0	132
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5503828)								
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	119	72.0	129
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	0.25 µg/L	93.6	72.0	129
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	0.25 µg/L	88.6	72.0	130
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	0.25 µg/L	112	71.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	0.25 µg/L	97.4	69.0	130
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	0.25 µg/L	118	71.0	129
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	0.25 µg/L	122	69.0	133
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	0.25 µg/L	123	72.0	134
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	0.25 µg/L	115	65.0	144
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	0.25 µg/L	107	71.0	132
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5503841)								
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	92.8	72.0	129
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	0.25 µg/L	104	72.0	129

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: 5503841) - continued								
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	99.4	71.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	0.25 µg/L	103	69.0	130
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	0.25 µg/L	97.8	71.0	129
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	0.25 µg/L	96.0	69.0	133
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	0.25 µg/L	97.6	72.0	134
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	0.25 µg/L	108	65.0	144
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	0.25 µg/L	94.6	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5503827)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.25 µg/L	74.8	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	0.625 µg/L	108	68.0	141
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	0.625 µg/L	90.2	60.5	138
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	0.625 µg/L	103	68.3	134
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	0.625 µg/L	96.1	62.2	138
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	0.25 µg/L	91.2	65.0	136
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	0.25 µg/L	122	61.0	135
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5503828)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.25 µg/L	122	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	0.625 µg/L	134	68.0	141
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	0.625 µg/L	118	60.5	138
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	0.625 µg/L	102	68.3	134
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	0.625 µg/L	107	62.2	138
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	0.25 µg/L	116	65.0	136
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	0.25 µg/L	79.6	61.0	135
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5503841)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.25 µg/L	84.4	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	0.625 µg/L	122	68.0	141
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	0.625 µg/L	111	60.5	138

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
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5503841) - continued								
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	0.625 µg/L	95.6	68.3	134
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	0.625 µg/L	91.7	62.2	138
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	0.25 µg/L	97.4	65.0	136
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	0.25 µg/L	105	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5503827)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.2343 µg/L	116	63.0	143
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	0.2378 µg/L	107	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	0.24 µg/L	115	67.0	138
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	0.241 µg/L	96.3	64.2	133
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5503828)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.2343 µg/L	88.6	63.0	143
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	0.2378 µg/L	91.7	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	0.24 µg/L	105	67.0	138
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	0.241 µg/L	94.0	64.2	133
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5503841)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.2343 µg/L	107	63.0	143
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	0.2378 µg/L	115	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	0.24 µg/L	91.7	67.0	138
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	0.241 µg/L	78.6	64.2	133
EP231P: PFAS Sums (QCLot: 5503827)								
EP231X: Sum of PFAS	---	0.01	µg/L	<0.01	---	---	---	---
EP231X: Sum of PFHxS and PFOS	355-46-4/17 63-23-1	0.01	µg/L	<0.01	---	---	---	---
EP231X: Sum of PFAS (WA DER List)	---	0.01	µg/L	<0.01	---	---	---	---
EP231P: PFAS Sums (QCLot: 5503828)								
EP231X: Sum of PFAS	---	0.01	µg/L	<0.01	---	---	---	---
EP231X: Sum of PFHxS and PFOS	355-46-4/17 63-23-1	0.01	µg/L	<0.01	---	---	---	---
EP231X: Sum of PFAS (WA DER List)	---	0.01	µg/L	<0.01	---	---	---	---
EP231P: PFAS Sums (QCLot: 5503841)								
EP231X: Sum of PFAS	---	0.01	µg/L	<0.01	---	---	---	---

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
EP231P: PFAS Sums (QCLot: 5503841) - continued								
EP231X: Sum of PFHxS and PFOS	355-46-4/17 63-23-1	0.01	µg/L	<0.01	---	---	---	---
EP231X: Sum of PFAS (WA DER List)	---	0.01	µg/L	<0.01	---	---	---	---

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
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 5501016)							
EP2317690-001	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	100 mg/L	# Not Determined	70.4	130
ED045G: Chloride by Discrete Analyser (QCLot: 5501017)							
EP2317690-001	Anonymous	ED045G: Chloride	16887-00-6	200 mg/L	# Not Determined	70.0	130
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5503827)							
EP2317849-001	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.2218 µg/L	97.3	72.0	129
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.232 µg/L	122	71.0	127
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.2352 µg/L	109	68.0	129
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.238 µg/L	110	69.0	134
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.232 µg/L	92.1	65.0	140
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.241 µg/L	91.3	53.0	129
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5503827)							
EP2317849-001	Anonymous	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	1.25 µg/L	102	73.0	142
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.25 µg/L	104	72.0	129
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.25 µg/L	111	72.0	129
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.25 µg/L	108	72.0	130
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.25 µg/L	114	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	92.0	71.0	134
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.25 µg/L	103	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	118	65.0	144
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.25 µg/L	115	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5503827)							
EP2317849-001	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.25 µg/L	75.2	59.0	135

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: 5503827) - continued							
EP2317849-001	Anonymous	EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.625 µg/L	124	70.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.625 µg/L	93.4	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.625 µg/L	89.8	70.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.625 µg/L	105	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.25 µg/L	87.4	65.0	136
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.25 µg/L	114	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5503827)							
EP2317849-001	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.234 µg/L	114	63.0	143
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.2378 µg/L	111	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.24 µg/L	106	67.0	138
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.2415 µg/L	90.2	70.0	130

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **EP2317850**	Page	: 1 of 6
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Telephone	: +61-8-9406 1301
Project	: WA_0089_PFASOMP_23	Date Samples Received	: 13-Dec-2023
Site	: Stirling SW/PW - JS	Issue Date	: 22-Dec-2023
Sampler	: [redacted] [redacted]	No. of samples received	: 6
Order number	: pfas-omp/Stirling	No. of samples analysed	: 6

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.**
- **Matrix Spike outliers exist - please see following pages for full details.**
- **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 : Quality Control Samples

Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

Matrix: **WATER**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
Matrix Spike (MS) Recoveries							
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA	EP2317690--001	Anonymous	**Sulfate as SO4 - Turbidimetric**	14808-79-8	Not Determined	---	**MS recovery not determined, background level greater than or equal to 4x spike level.**
ED045G: Chloride by Discrete Analyser	EP2317690--001	Anonymous	**Chloride**	16887-00-6	Not Determined	---	**MS recovery not determined, background level greater than or equal to 4x spike level.**

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	2	25	8.00	10.00	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)						
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	25	4.00	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*			*Analysis*		
			Date extracted	*Due for extraction*	*Evaluation*	*Date analysed*	*Due for analysis*	*Evaluation*
ED037P: Alkalinity by PC Titrator								
Clear Plastic Bottle - Natural (ED037-P)								
0089_PW415_231213,	0089_PW413_231213,	**13-Dec-2023**	---	---	---	**20-Dec-2023**	27-Dec-2023	✓
0089_PW411_231213,	0089_SW412_231213,							
0089_SW414_231213,	0089_SW416_231213							
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA								
Clear Plastic Bottle - Natural (ED041G)								
0089_PW415_231213,	0089_PW413_231213,	**13-Dec-2023**	---	---	---	**22-Dec-2023**	10-Jan-2024	✓
0089_PW411_231213,	0089_SW412_231213,							
0089_SW414_231213,	0089_SW416_231213							

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
ED045G: Chloride by Discrete Analyser								
Clear Plastic Bottle - Natural (ED045G)								
0089_PW415_231213,	0089_PW413_231213,	**13-Dec-2023**	**----**	----	----	**22-Dec-2023**	10-Jan-2024	✓
0089_PW411_231213,	0089_SW412_231213,							
0089_SW414_231213,	0089_SW416_231213							
ED093F: Dissolved Major Cations								
Clear Plastic Bottle - Natural (ED093F)								
0089_PW415_231213,	0089_PW413_231213,	**13-Dec-2023**	**----**	----	----	**20-Dec-2023**	20-Dec-2023	✓
0089_PW411_231213,	0089_SW412_231213,							
0089_SW414_231213,	0089_SW416_231213							
EP231A: Perfluoroalkyl Sulfonic Acids								
HDPE (no PTFE) (EP231X)								
0089_PW415_231213,	0089_PW413_231213,	**13-Dec-2023**	**19-Dec-2023**	10-Jun-2024	✓	**19-Dec-2023**	10-Jun-2024	✓
0089_PW411_231213								
HDPE (no PTFE) (EP231X)								
0089_SW412_231213,	0089_SW414_231213,	**13-Dec-2023**	**19-Dec-2023**	10-Jun-2024	✓	**20-Dec-2023**	10-Jun-2024	✓
0089_SW416_231213								
EP231B: Perfluoroalkyl Carboxylic Acids								
HDPE (no PTFE) (EP231X)								
0089_PW415_231213,	0089_PW413_231213,	**13-Dec-2023**	**19-Dec-2023**	10-Jun-2024	✓	**19-Dec-2023**	10-Jun-2024	✓
0089_PW411_231213								
HDPE (no PTFE) (EP231X)								
0089_SW412_231213,	0089_SW414_231213,	**13-Dec-2023**	**19-Dec-2023**	10-Jun-2024	✓	**20-Dec-2023**	10-Jun-2024	✓
0089_SW416_231213								
EP231C: Perfluoroalkyl Sulfonamides								
HDPE (no PTFE) (EP231X)								
0089_PW415_231213,	0089_PW413_231213,	**13-Dec-2023**	**19-Dec-2023**	10-Jun-2024	✓	**19-Dec-2023**	10-Jun-2024	✓
0089_PW411_231213								
HDPE (no PTFE) (EP231X)								
0089_SW412_231213,	0089_SW414_231213,	**13-Dec-2023**	**19-Dec-2023**	10-Jun-2024	✓	**20-Dec-2023**	10-Jun-2024	✓
0089_SW416_231213								
EP231D: (n:2) Fluorotelomer Sulfonic Acids								
HDPE (no PTFE) (EP231X)								
0089_PW415_231213,	0089_PW413_231213,	**13-Dec-2023**	**19-Dec-2023**	10-Jun-2024	✓	**19-Dec-2023**	10-Jun-2024	✓
0089_PW411_231213								
HDPE (no PTFE) (EP231X)								
0089_SW412_231213,	0089_SW414_231213,	**13-Dec-2023**	**19-Dec-2023**	10-Jun-2024	✓	**20-Dec-2023**	10-Jun-2024	✓
0089_SW416_231213								

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)								
0089_PW415_231213, 0089_PW411_231213	0089_PW413_231213,	**13-Dec-2023**	**19-Dec-2023**	10-Jun-2024	✓	**19-Dec-2023**	10-Jun-2024	✓
HDPE (no PTFE) (EP231X)								
0089_SW412_231213, 0089_SW416_231213	0089_SW414_231213,	**13-Dec-2023**	**19-Dec-2023**	10-Jun-2024	✓	**20-Dec-2023**	10-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)							
Alkalinity by Auto Titrator	ED037-P	2	10	**20.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	17	**11.76**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	25	**8.00**	**10.00**	×	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	17	**11.76**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Alkalinity by Auto Titrator	ED037-P	2	10	**20.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	17	**11.76**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	3	25	**12.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	17	**11.76**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Alkalinity by Auto Titrator	ED037-P	1	10	**10.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	1	17	**5.88**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	3	25	**12.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	17	**5.88**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Chloride by Discrete Analyser	ED045G	1	17	**5.88**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	25	**4.00**	**5.00**	×	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	17	**5.88**	**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
Alkalinity by Auto Titrator	ED037-P	WATER	In house: Referenced to APHA 2320 B This procedure determines alkalinity by automated measurement (e.g. PC Titrate) on a settled supernatant aliquot of the sample using pH 4.5 for indicating the total alkalinity end-point. This method is compliant with NEPM Schedule B(3)
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	WATER	In house: Referenced to APHA 4500-SO4. Dissolved sulfate is determined in a 0.45um filtered sample. Sulfate ions are converted to a barium sulfate suspension in an acetic acid medium with barium chloride. Light absorbance of the BaSO4 suspension is measured by a photometer and the SO4-2 concentration is determined by comparison of the reading with a standard curve. This method is compliant with NEPM Schedule B(3)
Chloride by Discrete Analyser	ED045G	WATER	In house: Referenced to APHA 4500 Cl - G.The thiocyanate ion is liberated from mercuric thiocyanate through sequestration of mercury by the chloride ion to form non-ionised mercuric chloride. In the presence of ferric ions the liberated thiocynate forms highly-coloured ferric thiocynate which is measured at 480 nm.
Major Cations - Dissolved	ED093F	WATER	In house: Referenced to APHA 3120 and 3125; USEPA SW 846 - 6010 and 6020; Cations are determined by either ICP-AES or ICP-MS techniques. This method is compliant with NEPM Schedule B(3) Sodium Adsorption Ratio is calculated from Ca, Mg and Na which determined by ALS in house method QWI-EN/ED093F. This method is compliant with NEPM Schedule B(3) Hardness parameters are calculated based on APHA 2340 B. This method is compliant with NEPM Schedule B(3)
Ionic Balance by PCT DA and Turbi SO4 DA	* EN055 - PG	WATER	In house: Referenced to APHA 1030F. This method is compliant with NEPM Schedule B(3)
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.

CHAIN OF CUSTODY

COC#: 61799 *ALS Laboratory:* EP Perth Environmental

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME: 19/12 1630	DATE TIME:	DATE TIME:

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP_23

SITE: Stirling SW/PW - SC

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO: [redacted]

CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

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	WA OMP Water Suite WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
001	0089_PW358		19/12/2023 12:27 PM	WATER	ALS: 3 Non ALS: 0	No	X		
002	0089_PW331	Lab QC added	19/12/2023 12:28 PM	WATER	ALS: 5 Non ALS: 0	No	X		
003	0089_SW156		19/12/2023 12:29 PM	WATER	ALS: 3 Non ALS: 0	No	X		
004	0089_PW330		19/12/2023 12:29 PM	WATER	ALS: 3 Non ALS: 0	No	X		
005	0089_PW357		19/12/2023 12:30 PM	WATER	ALS: 3 Non ALS: 0	No	X		
006	0089_SW154		19/12/2023 12:31 PM	WATER	ALS: 3 Non ALS: 0	No	X		
007	0089_SW152		19/12/2023 12:31 PM	WATER	ALS: 3 Non ALS: 0	No	X		

Environmental Division Perth

Work Order Reference

EP2318014

Telephone : +61-8-9406 1301

Tuesday, December 19, 2023 4:46:32 AM

CHAIN OF CUSTODY

COC#: 61799 *ALS Laboratory:* EP Perth Environmental

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

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP_23

SITE: Stirling SW/PW - SC

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES 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	WA OMP Water Suite WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
008	0089_PW356		19/12/2023 12:32 PM	WATER	ALS: 3 Non ALS: 0	No	X		
009	0089_PW329		19/12/2023 12:33 PM	WATER	ALS: 3 Non ALS: 0	No	X		
010	0089_SW150	Lab QC added	19/12/2023 12:34 PM	WATER	ALS: 5 Non ALS: 0	No	X		

CHAIN OF CUSTODY

ALS COC#: 61799 *ALS Laboratory:* EP Perth Environmental

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

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP_23

SITE: Stirling SW/PW - SC

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES 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	0089_PW358	Clear Plastic Bottle - Natural	125 mL	00070522229737	Green	No	
001	0089_PW358	HDPE (no PTFE)	20 mL	00352309068272	Grey	No	
001	0089_PW358	HDPE (no PTFE)	20 mL	00352309068210	Grey	No	
002	0089_PW331	Clear Plastic Bottle - Natural	125 mL	00070522229906	Green	No	
002	0089_PW331	HDPE (no PTFE)	20 mL	00352309068020	Grey	No	
002	0089_PW331	HDPE (no PTFE)	20 mL	00352309068270	Grey	No	
002	0089_PW331	HDPE (no PTFE)	20 mL	00352309068201	Grey	No	
002	0089_PW331	HDPE (no PTFE)	20 mL	00352309068328	Grey	No	
003	0089_SW156	HDPE (no PTFE)	20 mL	00352309068277	Grey	No	
003	0089_SW156	HDPE (no PTFE)	20 mL	00352309068343	Grey	No	
003	0089_SW156	Clear Plastic Bottle - Natural	125 mL	00070522229607	Green	No	
004	0089_PW330	HDPE (no PTFE)	20 mL	00352309067984	Grey	No	
004	0089_PW330	Clear Plastic Bottle - Natural	125 mL	00070522229803	Green	No	
004	0089_PW330	HDPE (no PTFE)	20 mL	00352309067902	Grey	No	
005	0089_PW357	HDPE (no PTFE)	20 mL	00350822082591	Grey	No	
005	0089_PW357	Clear Plastic Bottle - Natural	125 mL	00070522054835	Green	No	
005	0089_PW357	HDPE (no PTFE)	20 mL	00350822082535	Grey	No	
006	0089_SW154	Clear Plastic Bottle - Natural	125 mL	00070522229576	Green	No	
006	0089_SW154	HDPE (no PTFE)	20 mL	00352309068207	Grey	No	
006	0089_SW154	HDPE (no PTFE)	20 mL	00352309067970	Grey	No	
007	0089_SW152	Clear Plastic Bottle - Natural	125 mL	00070522229575	Green	No	
007	0089_SW152	HDPE (no PTFE)	20 mL	00352309067896	Grey	No	
007	0089_SW152	HDPE (no PTFE)	20 mL	00352309068231	Grey	No	
008	0089_PW356	HDPE (no PTFE)	20 mL	00352309068287	Grey	No	
008	0089_PW356	HDPE (no PTFE)	20 mL	00352309067969	Grey	No	
008	0089_PW356	Clear Plastic Bottle - Natural	125 mL	00070522229881	Green	No	

CHAIN OF CUSTODY

COC#: 61799 *ALS Laboratory:* EP Perth Environmental

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

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP_23

SITE: Stirling SW/PW - SC

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO: [redacted]

CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

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:

009	0089_PW329	HDPE (no PTFE)	20 mL	00352309068197	Grey	No	
009	0089_PW329	HDPE (no PTFE)	20 mL	00352309067949	Grey	No	
009	0089_PW329	Clear Plastic Bottle - Natural	125 mL	00070522229891	Green	No	
010	0089_SW150	Clear Plastic Bottle - Natural	125 mL	00070522229700	Green	No	
010	0089_SW150	HDPE (no PTFE)	20 mL	00352309068264	Grey	No	
010	0089_SW150	HDPE (no PTFE)	20 mL	00352309068237	Grey	No	
010	0089_SW150	HDPE (no PTFE)	20 mL	00352309068017	Grey	No	
010	0089_SW150	HDPE (no PTFE)	20 mL	00352309068385	Grey	No	

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

CHAIN OF CUSTODY

COC#: **61801** *ALS Laboratory:* EP Perth Environmental

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

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP_23

SITE: Stirling SD - SC

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES 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	0089_SD357	HDPE Soil Jar	200 mL	00621122011133	Grey	No	
002	0089_SD358	HDPE Soil Jar	200 mL	00621122011150	Grey	No	
003	0089_SD356	HDPE Soil Jar	200 mL	00621122011122	Grey	No	
004	0089_SD331	HDPE Soil Jar	200 mL	00621122011101	Grey	No	
005	0089_SD329	HDPE Soil Jar	200 mL	00621122011205	Grey	No	
006	0089_SD330	HDPE Soil Jar	200 mL	00621122011170	Grey	No	

Total Bottle Count: ALS: 6, Non ALS: 0

SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : **EP2318014**

Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: Customer Services EP
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
E-mail	: [redacted]stantec.com	E-mail	: ALSEnviro.Perth@alsglobal.com
Telephone	: ----	Telephone	: +61-8-9406 1301
Facsimile	: ----	Facsimile	: +61-8-9406 1399
Project	: WA_0089_PFASOMP_23	Page	: 1 of 2
Order number	: pfas-omp/Stirling	Quote number	: ES2022MWHAUS0002 (SY/139/19 B)
C-O-C number	: 61799	QC Level	: NEPM 2013 B3 & ALS QC Standard
Site	: Stirling SW/PW - SC		
Sampler	: [redacted]		

Dates

Date Samples Received	: 19-Dec-2023 16:30	Issue Date	: 20-Dec-2023
Client Requested Due Date	: 02-Jan-2024	Scheduled Reporting Date	: **02-Jan-2024**

Delivery Details

Mode of Delivery	: Carrier	Security Seal	: Intact.
No. of coolers/boxes	: 1	Temperature	: 8.2 - Ice present
Receipt Detail	:	No. of samples received / analysed	: 10 / 10

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 see scanned COC for sample discrepencies: extra samples , samples not received etc.
- Please direct any queries related to sample condition / numbering / breakages to Sample Receipt (Samples.Perth@alsglobal.com)
- Analytical work for this work order will be conducted at ALS Environmental Perth.
- Please direct any turnaround / technical queries to the laboratory contact designated above.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months) from receipt of samples.
- **pH analysis should be conducted within 6 hours of sampling.**
- **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.**
- 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.**

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

EP2318014-002 : 19-Dec-2023 12:28 : 0089_PW331_231219 - Lab QC added
EP2318014-010 : 19-Dec-2023 12:34 : 0089_SW150_231219 - Lab QC added

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)	WATER - NT-01 & 02 Ca, Mg, Na, K, Cl, SO4, Alkalinity
EP2318014-001	19-Dec-2023 12:27	0089_PW358_231219	✓	✓
EP2318014-002	19-Dec-2023 12:28	0089_PW331_231219 L...	✓	✓
EP2318014-003	19-Dec-2023 12:29	0089_SW156_231219	✓	✓
EP2318014-004	19-Dec-2023 12:29	0089_PW330_231219	✓	✓
EP2318014-005	19-Dec-2023 12:30	0089_PW357_231219	✓	✓
EP2318014-006	19-Dec-2023 12:31	0089_SW154_231219	✓	✓
EP2318014-007	19-Dec-2023 12:31	0089_SW152_231219	✓	✓
EP2318014-008	19-Dec-2023 12:32	0089_PW356_231219	✓	✓
EP2318014-009	19-Dec-2023 12:33	0089_PW329_231219	✓	✓
EP2318014-010	19-Dec-2023 12:34	0089_SW150_231219 L...	✓	✓

Proactive Holding Time Report

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

Requested Deliverables

[redacted]
- A4 - AU Tax Invoice (INV) Email [redacted]cardno.com.au

DERP LAB REPORTS
- EDI Format - ESDAT (ESDAT) Email derp.labreports@esdat.com.au

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

CERTIFICATE OF ANALYSIS

Work Order	: **EP2318014**	Page	: 1 of 9
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: Customer Services EP
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: +61-8-9406 1301
Project	: WA_0089_PFASOMP_23	Date Samples Received	: 19-Dec-2023 16:30
Order number	: pfas-omp/Stirling	Date Analysis Commenced	: 21-Dec-2023
C-O-C number	: 61799	Issue Date	: 03-Jan-2024 21:45
Sampler	: [redacted]		
Site	: Stirling SW/PW - SC		
Quote number	: SY/139/19 B		
No. of samples received	: 10		
No. of samples analysed	: 10		

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]	Inorganics Supervisor	Perth Inorganics, Wangara, WA
[redacted]	Laboratory Manager (Perth)	Perth Inorganics, Wangara, WA
[redacted]	SENIOR LAB TECH	Perth Organics, Wangara, WA

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.
- As per QWI – EN55-3 Data Interpreting Procedures, Ionic balances are typically calculated using Major Anions - Chloride, Alkalinity and Sulfate; and Major Cations - Calcium, Magnesium, Potassium and Sodium. Where applicable and dependent upon sample matrix, the Ionic Balance may also include the additional contribution of Ammonia, Dissolved Metals by ICPMS and H+ to the Cations and Nitrate, SiO2 and Fluoride to the Anions.
- EP231X: High failing surrogates on sample EP2318014-009 deemed acceptable as all associated analytes are <LOR.
- Sodium Adsorption Ratio (where reported): Where results for Na, Ca or Mg are <LOR, a concentration at half the reported LOR is incorporated into the SAR calculation. This represents a conservative approach for Na relative to the assumption that <LOR = zero concentration and a conservative approach for Ca & Mg relative to the assumption that <LOR is equivalent to the LOR concentration.
- 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.
- ED045G: The presence of Thiocyanate, Thiosulfate and Sulfite can positively contribute to the chloride result, thereby may bias results higher than expected. Results should be scrutinised accordingly.

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_PW358_231219	0089_PW331_231219 Lab QC added	0089_SW156_231219	0089_PW330_231219	0089_PW357_231219
				Sampling date / time	19-Dec-2023 12:27	19-Dec-2023 12:28	19-Dec-2023 12:29	19-Dec-2023 12:29	19-Dec-2023 12:30
Compound	CAS Number	LOR	Unit		EP2318014-001	EP2318014-002	EP2318014-003	EP2318014-004	EP2318014-005
					Result	Result	Result	Result	Result
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	<1	<1	<1	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	<1	<1	<1	<1
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		182	155	126	134	164
Total Alkalinity as CaCO3	---	1	mg/L		182	155	126	134	164
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		3020	2980	2950	3040	3150
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		23100	20100	21500	21800	23200
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		517	521	474	473	501
Magnesium	7439-95-4	1	mg/L		1590	1660	1530	1520	1590
Sodium	7440-23-5	1	mg/L		12600	12600	12000	11900	12500
Potassium	7440-09-7	1	mg/L		621	682	594	591	619
EN055: Ionic Balance									
ø Total Anions	---	0.01	meq/L		718	632	670	681	723
ø Total Cations	---	0.01	meq/L		721	728	687	681	715
ø Ionic Balance	---	0.01	%		0.17	7.06	1.20	0.04	0.55
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

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_PW358_231219	0089_PW331_231219 Lab QC added	0089_SW156_231219	0089_PW330_231219	0089_PW357_231219
				Sampling date / time	19-Dec-2023 12:27	19-Dec-2023 12:28	19-Dec-2023 12:29	19-Dec-2023 12:29	19-Dec-2023 12:30
Compound	CAS Number	LOR	Unit		EP2318014-001	EP2318014-002	EP2318014-003	EP2318014-004	EP2318014-005
					Result	Result	Result	Result	Result
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
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									

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_PW358_231219	0089_PW331_231219 Lab QC added	0089_SW156_231219	0089_PW330_231219	0089_PW357_231219
				Sampling date / time	19-Dec-2023 12:27	19-Dec-2023 12:28	19-Dec-2023 12:29	19-Dec-2023 12:29	19-Dec-2023 12:30
Compound	CAS Number	LOR	Unit		EP2318014-001	EP2318014-002	EP2318014-003	EP2318014-004	EP2318014-005
					Result	Result	Result	Result	Result
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
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	%		**99.0**	**107**	**70.0**	**96.0**	**98.2**
13C8-PFOA	---	0.02	%		**99.4**	**99.9**	**73.9**	**98.9**	**103**

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_SW154_231219	0089_SW152_231219	0089_PW356_231219	0089_PW329_231219	0089_SW150_231219 Lab QC added
				Sampling date / time	19-Dec-2023 12:31	19-Dec-2023 12:31	19-Dec-2023 12:32	19-Dec-2023 12:33	19-Dec-2023 12:34
Compound	CAS Number	LOR	Unit		EP2318014-006	EP2318014-007	EP2318014-008	EP2318014-009	EP2318014-010
					Result	Result	Result	Result	Result
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	<1	<1	<1	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	<1	<1	<1	<1
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		126	126	188	146	126
Total Alkalinity as CaCO3	---	1	mg/L		126	126	188	146	126
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		2590	2970	2900	3020	2980
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		17500	21900	21400	21700	21400
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		452	467	546	478	464
Magnesium	7439-95-4	1	mg/L		1440	1510	1750	1520	1500
Sodium	7440-23-5	1	mg/L		10900	11900	13300	12000	11800
Potassium	7440-09-7	1	mg/L		580	589	726	592	581
EN055: Ionic Balance									
ø Total Anions	---	0.01	meq/L		550	682	668	678	668
ø Total Cations	---	0.01	meq/L		630	680	768	686	675
ø Ionic Balance	---	0.01	%		6.77	0.14	7.00	0.60	0.48
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

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_SW154_231219	0089_SW152_231219	0089_PW356_231219	0089_PW329_231219	0089_SW150_231219 Lab QC added
				Sampling date / time	19-Dec-2023 12:31	19-Dec-2023 12:31	19-Dec-2023 12:32	19-Dec-2023 12:33	19-Dec-2023 12:34
Compound	CAS Number	LOR	Unit		EP2318014-006	EP2318014-007	EP2318014-008	EP2318014-009	EP2318014-010
					Result	Result	Result	Result	Result
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
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									

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_SW154_231219	0089_SW152_231219	0089_PW356_231219	0089_PW329_231219	0089_SW150_231219 Lab QC added
				Sampling date / time	19-Dec-2023 12:31	19-Dec-2023 12:31	19-Dec-2023 12:32	19-Dec-2023 12:33	19-Dec-2023 12:34
Compound	CAS Number	LOR	Unit		EP2318014-006	EP2318014-007	EP2318014-008	EP2318014-009	EP2318014-010
					Result	Result	Result	Result	Result
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
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	%		**97.8**	**101**	**108**	**168**	**104**
13C8-PFOA	---	0.02	%		**99.1**	**99.7**	**98.8**	**167**	**100**

Surrogate Control Limits

Sub-Matrix: SURFACE WATER		Recovery Limits (%)	
Compound	CAS Number	Low	High
EP231S: PFAS Surrogate			
13C4-PFOS	---	65	140
13C8-PFOA	---	71	133

QUALITY CONTROL REPORT

Work Order	: **EP2318014**	Page	: 1 of 9
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: Customer Services EP
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: +61-8-9406 1301
Project	: WA_0089_PFASOMP_23	Date Samples Received	: 19-Dec-2023
Order number	: pfas-omp/Stirling	Date Analysis Commenced	: 21-Dec-2023
C-O-C number	: 61799	Issue Date	: 03-Jan-2024
Sampler	: [redacted] [redacted]		
Site	: Stirling SW/PW - SC		
Quote number	: SY/139/19 B		
No. of samples received	: 10		
No. of samples analysed	: 10		

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]	Inorganics Supervisor	Perth Inorganics, Wangara, WA
[redacted]	Laboratory Manager (Perth)	Perth Inorganics, Wangara, WA
[redacted]	SENIOR LAB TECH	Perth Organics, Wangara, WA

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 (%)
ED037P: Alkalinity by PC Titrator (QC Lot: 5520169)									
EP2318014-002	0089_PW331_231219 Lab QC added	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	155	155	0.0	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	155	155	0.0	0% - 20%
EP2318059-002	Anonymous	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	683	686	0.4	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	683	686	0.4	0% - 20%
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QC Lot: 5511211)									
EP2318014-001	0089_PW358_231219	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	3020	3190	5.4	0% - 20%
EP2318124-001	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	9	7	20.4	No Limit
ED045G: Chloride by Discrete Analyser (QC Lot: 5511212)									
EP2318014-001	0089_PW358_231219	ED045G: Chloride	16887-00-6	1	mg/L	23100	23000	0.3	0% - 20%
EP2318124-001	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	108	102	5.8	0% - 20%
ED093F: Dissolved Major Cations (QC Lot: 5510350)									
EP2318014-001	0089_PW358_231219	ED093F: Calcium	7440-70-2	1	mg/L	517	509	1.7	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	1590	1580	1.0	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	12600	12400	1.1	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	621	619	0.4	0% - 20%
EP2318017-001	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	124	125	0.9	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	67	68	1.5	0% - 20%

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 (%)
ED093F: Dissolved Major Cations (QC Lot: 5510350) - continued									
EP2318017-001	Anonymous	ED093F: Sodium	7440-23-5	1	mg/L	472	479	1.5	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	25	25	0.0	0% - 20%
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 5513195)									
EP2318014-002	0089_PW331_231219 Lab QC added	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
EP2318017-001	Anonymous	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
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 5513195)									
EP2318014-002	0089_PW331_231219 Lab QC added	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
EP2318017-001	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

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 (%)
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 5513195) - continued									
EP2318017-001	Anonymous	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: 5513195)									
EP2318014-002	0089_PW331_231219 Lab QC added	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
EP2318017-001	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: 5513195)									
EP2318014-002	0089_PW331_231219 Lab QC added	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
EP2318017-001	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

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: 5513195) - continued									
EP2318017-001	Anonymous	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: 5513195)									
EP2318014-002	0089_PW331_231219 Lab QC added	EP231X: Sum of PFAS	----	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	<0.01	<0.01	0.0	No Limit
EP2318017-001	Anonymous	EP231X: Sum of PFAS	----	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	<0.01	<0.01	0.0	No Limit

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
ED037P: Alkalinity by PC Titrator (QCLot: 5520169)								
ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	---	---	---	---
ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	---	---	---	---
ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	<1	---	---	---	---
ED037-P: Total Alkalinity as CaCO3	---	1	mg/L	<1	20 mg/L	112	85.1	126
				<1	200 mg/L	101	90.5	111
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 5511211)								
ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<1	25 mg/L	105	89.9	112
				<1	500 mg/L	108	89.9	112
ED045G: Chloride by Discrete Analyser (QCLot: 5511212)								
ED045G: Chloride	16887-00-6	1	mg/L	<1	10 mg/L	98.3	88.6	113
				<1	1000 mg/L	97.0	88.6	113
ED093F: Dissolved Major Cations (QCLot: 5510350)								
ED093F: Calcium	7440-70-2	1	mg/L	<1	50 mg/L	101	86.5	117
ED093F: Magnesium	7439-95-4	1	mg/L	<1	50 mg/L	100	88.4	110
ED093F: Sodium	7440-23-5	1	mg/L	<1	50 mg/L	97.7	91.4	113
ED093F: Potassium	7440-09-7	1	mg/L	<1	50 mg/L	96.2	84.6	108
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5513195)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.2218 µg/L	93.1	72.0	130
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.2352 µg/L	84.0	71.0	127
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	0.2373 µg/L	96.1	68.0	131
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.238 µg/L	99.2	69.0	134
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.232 µg/L	90.1	65.0	140
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.241 µg/L	88.0	53.0	142
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5513195)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	1.25 µg/L	94.2	73.0	129
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	0.25 µg/L	95.2	72.0	129
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	0.25 µg/L	98.6	72.0	129
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	0.25 µg/L	88.2	72.0	130
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	0.25 µg/L	95.2	71.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	0.25 µg/L	91.2	69.0	130

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
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5513195) - continued								
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	0.25 µg/L	97.2	71.0	129
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	0.25 µg/L	97.8	69.0	133
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	0.25 µg/L	76.4	72.0	134
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	0.25 µg/L	84.6	65.0	144
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	0.25 µg/L	99.4	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5513195)								
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	109	68.0	141
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	0.625 µg/L	95.8	60.5	138
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	0.625 µg/L	112	68.3	134
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	0.625 µg/L	91.0	62.2	138
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	0.25 µg/L	97.0	65.0	136
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	0.25 µg/L	101	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5513195)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.2343 µg/L	102	63.0	143
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	0.2378 µg/L	100	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	0.24 µg/L	99.8	67.0	138
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	0.241 µg/L	83.2	64.2	133
EP231P: PFAS Sums (QCLot: 5513195)								
EP231X: Sum of PFAS	---	0.01	µg/L	<0.01	---	---	---	---
EP231X: Sum of PFHxS and PFOS	355-46-4/17 63-23-1	0.01	µg/L	<0.01	---	---	---	---
EP231X: Sum of PFAS (WA DER List)	---	0.01	µg/L	<0.01	---	---	---	---

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
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 5511211)							
EP2318014-001	0089_PW358_231219						

Sub-Matrix: **WATER**

Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report: Spike Concentration	Matrix Spike (MS) Report: SpikeRecovery(%) MS	Matrix Spike (MS) Report: Acceptable Limits (%) Low	Matrix Spike (MS) Report: Acceptable Limits (%) High
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 5511211) - continued							
EP2318014-001	0089_PW358_231219	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	100 mg/L	# Not Determined	70.4	130
ED045G: Chloride by Discrete Analyser (QCLot: 5511212)							
EP2318014-001	0089_PW358_231219	ED045G: Chloride	16887-00-6	200 mg/L	# Not Determined	70.0	130
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5513195)							
EP2318014-010	0089_SW150_231219 Lab QC added	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.2218 µg/L	94.0	72.0	129
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.232 µg/L	85.8	71.0	127
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.2352 µg/L	102	68.0	129
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.238 µg/L	102	69.0	134
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.232 µg/L	99.6	65.0	140
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.241 µg/L	92.1	53.0	129
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5513195)							
EP2318014-010	0089_SW150_231219 Lab QC added	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	1.25 µg/L	92.3	73.0	142
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.25 µg/L	104	72.0	129
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.25 µg/L	99.0	72.0	129
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.25 µg/L	95.0	72.0	130
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.25 µg/L	100	71.0	133
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.25 µg/L	98.0	69.0	130
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.25 µg/L	103	71.0	134
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.25 µg/L	111	69.0	133
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.25 µg/L	83.6	72.0	134
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.25 µg/L	79.0	65.0	144
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.25 µg/L	98.4	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5513195)							
EP2318014-010	0089_SW150_231219 Lab QC added	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.25 µg/L	97.0	59.0	135
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.625 µg/L	106	70.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.625 µg/L	96.5	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.625 µg/L	101	70.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.625 µg/L	98.5	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.25 µg/L	95.8	65.0	136
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.25 µg/L	102	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5513195)							

Sub-Matrix: **WATER**

Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report: Spike Concentration	Matrix Spike (MS) Report: SpikeRecovery(%) MS	Matrix Spike (MS) Report: Acceptable Limits (%) Low	Matrix Spike (MS) Report: Acceptable Limits (%) High
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5513195) - continued							
EP2318014-010	0089_SW150_231219 Lab QC added	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.234 µg/L	111	63.0	143
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.2378 µg/L	113	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.24 µg/L	104	67.0	138
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.2415 µg/L	83.9	70.0	130

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **EP2318014**	Page	: 1 of 6
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Telephone	: +61-8-9406 1301
Project	: WA_0089_PFASOMP_23	Date Samples Received	: 19-Dec-2023
Site	: Stirling SW/PW - SC	Issue Date	: 03-Jan-2024
Sampler	: [redacted]	No. of samples received	: 10
Order number	: pfas-omp/Stirling	No. of samples analysed	: 10

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.**
- **Matrix Spike outliers exist - please see following pages for full details.**
- **Surrogate recovery outliers exist for all regular sample matrices - please see following pages for full details.**

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 : Quality Control Samples

Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

Matrix: **WATER**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
Matrix Spike (MS) Recoveries							
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA	EP2318014--001	0089_PW358_231219	**Sulfate as SO4 - Turbidimetric**	14808-79-8	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
ED045G: Chloride by Discrete Analyser	EP2318014--001	0089_PW358_231219	**Chloride**	16887-00-6	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**

Regular Sample Surrogates

Sub-Matrix: **SURFACE WATER**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
Samples Submitted							
EP231S: PFAS Surrogate	EP2318014-009	0089_PW329_231219	**13C4-PFOS**	----	168 %	65.0-140 %	**Recovery greater than upper data quality objective**
EP231S: PFAS Surrogate	EP2318014-009	0089_PW329_231219	**13C8-PFOA**	----	167 %	71.0-133 %	**Recovery greater than upper data quality objective**

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)						
Major Cations - Dissolved	ED093F	2	25	8.00	10.00	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)						
Major Cations - Dissolved	ED093F	1	25	4.00	5.00	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)						
Major Cations - Dissolved	ED093F	1	25	4.00	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	*Sample Date*	*Extraction / Preparation*			*Analysis*		
Container / Client Sample ID(s)		*Date extracted*	*Due for extraction*	*Evaluation*	*Date analysed*	*Due for analysis*	*Evaluation*

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
ED037P: Alkalinity by PC Titrator								
Clear Plastic Bottle - Natural (ED037-P)								
0089_PW358_231219,	0089_PW331_231219 - Lab QC added,	**19-Dec-2023**	---	---	---	**30-Dec-2023**	02-Jan-2024	✓
0089_SW156_231219,	0089_PW330_231219,							
0089_PW357_231219,	0089_SW154_231219,							
0089_SW152_231219,	0089_PW356_231219,							
0089_PW329_231219,	0089_SW150_231219 - Lab QC added							
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA								
Clear Plastic Bottle - Natural (ED041G)								
0089_PW358_231219,	0089_PW331_231219 - Lab QC added,	**19-Dec-2023**	---	---	---	**02-Jan-2024**	16-Jan-2024	✓
0089_SW156_231219,	0089_PW330_231219,							
0089_PW357_231219,	0089_SW154_231219,							
0089_SW152_231219,	0089_PW356_231219,							
0089_PW329_231219,	0089_SW150_231219 - Lab QC added							
ED045G: Chloride by Discrete Analyser								
Clear Plastic Bottle - Natural (ED045G)								
0089_PW358_231219,	0089_PW331_231219 - Lab QC added,	**19-Dec-2023**	---	---	---	**02-Jan-2024**	16-Jan-2024	✓
0089_SW156_231219,	0089_PW330_231219,							
0089_PW357_231219,	0089_SW154_231219,							
0089_SW152_231219,	0089_PW356_231219,							
0089_PW329_231219,	0089_SW150_231219 - Lab QC added							
ED093F: Dissolved Major Cations								
Clear Plastic Bottle - Natural (ED093F)								
0089_PW358_231219,	0089_PW331_231219 - Lab QC added,	**19-Dec-2023**	---	---	---	**21-Dec-2023**	26-Dec-2023	✓
0089_SW156_231219,	0089_PW330_231219,							
0089_PW357_231219,	0089_SW154_231219,							
0089_SW152_231219,	0089_PW356_231219,							
0089_PW329_231219,	0089_SW150_231219 - Lab QC added							
EP231A: Perfluoroalkyl Sulfonic Acids								
HDPE (no PTFE) (EP231X)								
0089_PW358_231219,	0089_PW331_231219 - Lab QC added,	**19-Dec-2023**	**22-Dec-2023**	16-Jun-2024	✓	**22-Dec-2023**	16-Jun-2024	✓
0089_SW156_231219,	0089_PW330_231219,							
0089_PW357_231219,	0089_SW154_231219,							
0089_SW152_231219,	0089_PW356_231219,							
0089_PW329_231219,	0089_SW150_231219 - Lab QC added							
EP231B: Perfluoroalkyl Carboxylic Acids								
HDPE (no PTFE) (EP231X)								
0089_PW358_231219,	0089_PW331_231219 - Lab QC added,	**19-Dec-2023**	**22-Dec-2023**	16-Jun-2024	✓	**22-Dec-2023**	16-Jun-2024	✓
0089_SW156_231219,	0089_PW330_231219,							
0089_PW357_231219,	0089_SW154_231219,							
0089_SW152_231219,	0089_PW356_231219,							
0089_PW329_231219,	0089_SW150_231219 - Lab QC added							

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)								
0089_PW358_231219,	0089_PW331_231219 - Lab QC added,	**19-Dec-2023**	**22-Dec-2023**	16-Jun-2024	✓	**22-Dec-2023**	16-Jun-2024	✓
0089_SW156_231219,	0089_PW330_231219,							
0089_PW357_231219,	0089_SW154_231219,							
0089_SW152_231219,	0089_PW356_231219,							
0089_PW329_231219,	0089_SW150_231219 - Lab QC added							
EP231D: (n:2) Fluorotelomer Sulfonic Acids								
HDPE (no PTFE) (EP231X)								
0089_PW358_231219,	0089_PW331_231219 - Lab QC added,	**19-Dec-2023**	**22-Dec-2023**	16-Jun-2024	✓	**22-Dec-2023**	16-Jun-2024	✓
0089_SW156_231219,	0089_PW330_231219,							
0089_PW357_231219,	0089_SW154_231219,							
0089_SW152_231219,	0089_PW356_231219,							
0089_PW329_231219,	0089_SW150_231219 - Lab QC added							
EP231P: PFAS Sums								
HDPE (no PTFE) (EP231X)								
0089_PW358_231219,	0089_PW331_231219 - Lab QC added,	**19-Dec-2023**	**22-Dec-2023**	16-Jun-2024	✓	**22-Dec-2023**	16-Jun-2024	✓
0089_SW156_231219,	0089_PW330_231219,							
0089_PW357_231219,	0089_SW154_231219,							
0089_SW152_231219,	0089_PW356_231219,							
0089_PW329_231219,	0089_SW150_231219 - Lab QC added							

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)							
Alkalinity by Auto Titrator	ED037-P	2	13	**15.38**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	2	25	**8.00**	**10.00**	×	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	19	**10.53**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Alkalinity by Auto Titrator	ED037-P	2	13	**15.38**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	1	25	**4.00**	**5.00**	×	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	19	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Alkalinity by Auto Titrator	ED037-P	1	13	**7.69**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	1	25	**4.00**	**5.00**	×	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	19	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Chloride by Discrete Analyser	ED045G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	19	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	20	**5.00**	**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
Alkalinity by Auto Titrator	ED037-P	WATER	In house: Referenced to APHA 2320 B This procedure determines alkalinity by automated measurement (e.g. PC Titrate) on a settled supernatant aliquot of the sample using pH 4.5 for indicating the total alkalinity end-point. This method is compliant with NEPM Schedule B(3)
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	WATER	In house: Referenced to APHA 4500-SO4. Dissolved sulfate is determined in a 0.45um filtered sample. Sulfate ions are converted to a barium sulfate suspension in an acetic acid medium with barium chloride. Light absorbance of the BaSO4 suspension is measured by a photometer and the SO4-2 concentration is determined by comparison of the reading with a standard curve. This method is compliant with NEPM Schedule B(3)
Chloride by Discrete Analyser	ED045G	WATER	In house: Referenced to APHA 4500 Cl - G.The thiocyanate ion is liberated from mercuric thiocyanate through sequestration of mercury by the chloride ion to form non-ionised mercuric chloride. In the presence of ferric ions the liberated thiocynate forms highly-coloured ferric thiocynate which is measured at 480 nm.
Major Cations - Dissolved	ED093F	WATER	In house: Referenced to APHA 3120 and 3125; USEPA SW 846 - 6010 and 6020; Cations are determined by either ICP-AES or ICP-MS techniques. This method is compliant with NEPM Schedule B(3) Sodium Adsorption Ratio is calculated from Ca, Mg and Na which determined by ALS in house method QWI-EN/ED093F. This method is compliant with NEPM Schedule B(3) Hardness parameters are calculated based on APHA 2340 B. This method is compliant with NEPM Schedule B(3)
Ionic Balance by PCT DA and Turbi SO4 DA	* EN055 - PG	WATER	In house: Referenced to APHA 1030F. This method is compliant with NEPM Schedule B(3)
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.

CHAIN OF CUSTODY

COC#: 61801 ALS Laboratory: EP Perth Environmental

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME: 19/12 1630	DATE TIME:	DATE TIME:

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP_23

SITE: Stirling SD - SC

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted]

QUOTE NO: SY/139/19 B

SAMPLER MOBILE: [redacted] / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES 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 Sediments SEDIMENT	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
001	0089_SD357		19/12/2023 12:24 PM	SOIL	ALS: 1 Non ALS: 0	No	X		
002	0089_SD358		19/12/2023 12:25 PM	SOIL	ALS: 1 Non ALS: 0	No	X		
003	0089_SD356		19/12/2023 12:25 PM	SOIL	ALS: 1 Non ALS: 0	No	X		
004	0089_SD331		19/12/2023 12:25 PM	SOIL	ALS: 1 Non ALS: 0	No	X		
005	0089_SD329		19/12/2023 12:26 PM	SOIL	ALS: 1 Non ALS: 0	No	X		
006	0089_SD330		19/12/2023 12:26 PM	SOIL	ALS: 1 Non ALS: 0	No	X		

Environmental Division Perth

Work Order Reference

EP2318016

Telephone : 61-8-9406 1301

SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : **EP2318016**

Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: Customer Services EP
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
E-mail	: [redacted]stantec.com	E-mail	: ALSEnviro.Perth@alsglobal.com
Telephone	: ----	Telephone	: +61-8-9406 1301
Facsimile	: ----	Facsimile	: +61-8-9406 1399
Project	: WA_0089_PFASOMP_23	Page	: 1 of 2
Order number	: pfas-omp/Stirling	Quote number	: ES2022MWHAUS0002 (SY/139/19 B)
C-O-C number	: 61801	QC Level	: NEPM 2013 B3 & ALS QC Standard
Site	: Stirling SD - SC		
Sampler	: [redacted]		

Dates

Date Samples Received	: 19-Dec-2023 16:30	Issue Date	: 20-Dec-2023
Client Requested Due Date	: 02-Jan-2024	Scheduled Reporting Date	: **02-Jan-2024**

Delivery Details

Mode of Delivery	: Carrier	Security Seal	: Intact.
No. of coolers/boxes	: 1	Temperature	: 8.2 - Ice Bricks present
Receipt Detail	:	No. of samples received / analysed	: 6 / 6

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 see scanned COC for sample discrepencies: extra samples , samples not received etc.
- Please direct any queries related to sample condition / numbering / breakages to Sample Receipt (Samples.Perth@alsglobal.com)
- Analytical work for this work order will be conducted at ALS Environmental Perth.
- Please direct any turnaround / technical queries to the laboratory contact designated above.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months) from receipt of samples.
- **pH analysis should be conducted within 6 hours of sampling.**
- **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.**
- 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: **SOIL**

Laboratory sample ID	Sampling date / time	Sample ID	SOIL - EA055-103 Moisture Content	SOIL - EP231X (solids) PFAS - Full Suite (28 analytes)
EP2318016-001	19-Dec-2023 12:24	0089_SD357_231219	✓	✓
EP2318016-002	19-Dec-2023 12:25	0089_SD358_231219	✓	✓
EP2318016-003	19-Dec-2023 12:25	0089_SD356_231219	✓	✓
EP2318016-004	19-Dec-2023 12:25	0089_SD331_231219	✓	✓
EP2318016-005	19-Dec-2023 12:26	0089_SD329_231219	✓	✓
EP2318016-006	19-Dec-2023 12:26	0089_SD330_231219	✓	✓

Proactive Holding Time Report

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

Requested Deliverables

[redacted]
- A4 - AU Tax Invoice (INV) — Email — [redacted]cardno.com.au

DERP LAB REPORTS
- EDI Format - ESDAT (ESDAT) — Email — derp.labreports@esdat.com.au

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

CERTIFICATE OF ANALYSIS

Work Order	: **EP2318016**	Page	: 1 of 7
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: Customer Services EP
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: +61-8-9406 1301
Project	: WA_0089_PFASOMP_23	Date Samples Received	: 19-Dec-2023 16:30
Order number	: pfas-omp/Stirling	Date Analysis Commenced	: 27-Dec-2023
C-O-C number	: 61801	Issue Date	: 02-Jan-2024 14:58
Sampler	: [redacted]		
Site	: Stirling SD - SC		
Quote number	: SY/139/19 B		
No. of samples received	: 6		
No. of samples analysed	: 6		

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]	Inorganics Supervisor	Perth Inorganics, Wangara, WA
[redacted]	SENIOR LAB TECH	Perth Organics, Wangara, WA

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: High PFPeS matrix spike recovery for sample EP2317544-033 due to sample heterogeneity. Confirmed by visual inspection.
- 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: SEDIMENT (Matrix: SOIL)				Sample ID	0089_SD357_231219	0089_SD358_231219	0089_SD356_231219	0089_SD331_231219	0089_SD329_231219
				Sampling date / time	19-Dec-2023 12:24	19-Dec-2023 12:25	19-Dec-2023 12:25	19-Dec-2023 12:25	19-Dec-2023 12:26
Compound	CAS Number	LOR	Unit		EP2318016-001	EP2318016-002	EP2318016-003	EP2318016-004	EP2318016-005
					Result	Result	Result	Result	Result
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content	---	0.1	%		25.6	35.3	28.2	27.2	27.5
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg		<0.001	<0.001	<0.001	<0.001	<0.001
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002

Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)				Sample ID	0089_SD357_231219	0089_SD358_231219	0089_SD356_231219	0089_SD331_231219	0089_SD329_231219
				Sampling date / time	19-Dec-2023 12:24	19-Dec-2023 12:25	19-Dec-2023 12:25	19-Dec-2023 12:25	19-Dec-2023 12:26
Compound	CAS Number	LOR	Unit		EP2318016-001	EP2318016-002	EP2318016-003	EP2318016-004	EP2318016-005
					Result	Result	Result	Result	Result
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
EP231P: PFAS Sums									
Sum of PFAS	---	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Sum of PFAS (WA DER List)	---	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
EP231S: PFAS Surrogate									
13C4-PFOS	---	0.0002	%		**101**	**97.5**	**103**	**100**	**106**
13C8-PFOA	---	0.0002	%		**116**	**113**	**113**	**114**	**110**

Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)				Sample ID	0089_SD330_231219	----	----	----	----
				Sampling date / time	19-Dec-2023 12:26	---	---	---	---
Compound	CAS Number	LOR	Unit	EP2318016-006	--------	--------	--------	--------	
				Result	---	---	---	---	
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content	---	0.1	%	29.0	----	----	----	----	
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	----	----	----	----	
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	----	----	----	----	
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	----	----	----	----	
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	----	----	----	----	
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	----	----	----	----	
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	----	----	----	----	
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	----	----	----	----	
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	----	----	----	----	
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	----	----	----	----	
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	----	----	----	----	
Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	----	----	----	----	
Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	----	----	----	----	
Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	----	----	----	----	
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	----	----	----	----	
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	----	----	----	----	
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	----	----	----	----	
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	----	----	----	----	
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	----	----	----	----	

Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)				Sample ID	0089_SD330_231219	----	----	----	----
				Sampling date / time	19-Dec-2023 12:26	---	---	---	---
Compound	CAS Number	LOR	Unit		EP2318016-006	--------	--------	--------	--------
					Result	---	---	---	---
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg		<0.0005	----	----	----	----
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg		<0.0005	----	----	----	----
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0 0005	mg/kg		<0.0005	----	----	----	----
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0 0005	mg/kg		0 0005	----	----	----	----
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg		0 0002	----	----	----	----
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg		<0.0002	----	----	----	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg		<0.0005	----	----	----	----
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg		<0.0005	----	----	----	----
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg		<0.0005	----	----	----	----
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg		<0.0005	----	----	----	----
EP231P: PFAS Sums									
Sum of PFAS	---	0.0002	mg/kg		<0.0002	----	----	----	----
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg		<0.0002	----	----	----	----
Sum of PFAS (WA DER List)	---	0.0002	mg/kg		<0.0002	----	----	----	----
EP231S: PFAS Surrogate									
13C4-PFOS	---	0.0002	%		**102**	----	----	----	----
13C8-PFOA	---	0.0002	%		**114**	----	----	----	----

Surrogate Control Limits

Sub-Matrix: **SEDIMENT**		Recovery Limits (%)	
Compound	*CAS Number*	*Low*	*High*
EP231S: PFAS Surrogate			
13C4-PFOS	---	76	136
13C8-PFOA	---	78	131

QUALITY CONTROL REPORT

Work Order	: **EP2318016**	Page	: 1 of 7
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: Customer Services EP
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: +61-8-9406 1301
Project	: WA_0089_PFASOMP_23	Date Samples Received	: 19-Dec-2023
Order number	: pfas-omp/Stirling	Date Analysis Commenced	: 27-Dec-2023
C-O-C number	: 61801	Issue Date	: 02-Jan-2024
Sampler	: [redacted] [redacted]		
Site	: Stirling SD - SC		
Quote number	: SY/139/19 B		
No. of samples received	: 6		
No. of samples analysed	: 6		

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]	Inorganics Supervisor	Perth Inorganics, Wangara, WA
[redacted]	SENIOR LAB TECH	Perth Organics, Wangara, WA

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: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EA055: Moisture Content (Dried @ 105-110°C) (QC Lot: 5516915)									
EP2318016-001	0089_SD357_231219	EA055: Moisture Content	----	0.1	%	25.6	27.7	7.7	0% - 20%
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 5508734)									
EP2317544-032	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	0.0006	0.0005	0.0	No Limit
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	0.0029	0.0028	3.9	0% - 50%
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	0.0015	0.0014	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	0.0979	0.0894	9.0	0% - 20%
		EP231X Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
EP2318016-001	0089_SD357_231219	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 5508734)									
EP2317544 032	Anonymous	EP231X: Perfluoropentanoic acid (PFPeA)	2706 90 3	0 0002	mg/kg	0 0016	0 0014	9 2	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	0.0012	0.0011	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	0.0017	0.0016	0.0	No Limit
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	0.0095	0.0093	1.8	0% - 20%
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	0.0005	0.0005	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335 76 2	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit

Sub-Matrix: **SOIL**

				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: 5508734) - continued									
EP2317544-032	Anonymous	EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	<0.001	0.0	No Limit
EP2318016-001	0089_SD357_231219	EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	<0.001	0.0	No Limit
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 5508734)									
EP2317544-032	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	0.0007	0.0007	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0 0002	mg/kg	0 0002	0 0002	0 0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691 99 2	0 0005	mg/kg	0 0005	0 0005	0 0	No Limit
EP2318016-001	0089_SD357_231219	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506 32 8	0 0005	mg/kg	0 0005	0 0005	0 0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit

Sub-Matrix: **SOIL**

				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: 5508734) - continued									
EP2318016-001	0089_SD357_231219	EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 5508734)									
EP2317544-032	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
EP2318016-001	0089_SD357_231219	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
EP231P: PFAS Sums (QC Lot: 5508734)									
EP2317544-032	Anonymous	EP231X: Sum of PFAS	----	0.0002	mg/kg	0.118	0.109	8.3	0% - 20%
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg	0.101	0.0922	8.9	0% - 20%
		EP231X: Sum of PFAS (WA DER List)	----	0.0002	mg/kg	0.115	0.106	8.3	0% - 20%
EP2318016-001	0089_SD357_231219	EP231X: Sum of PFAS	----	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Sum of PFAS (WA DER List)	----	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit

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: **SOIL**

				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: 5508734)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	0.0011 mg/kg	109	72.0	128
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	0.00125 mg/kg	98.8	73.0	123
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	0.00118 mg/kg	111	67.0	130
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	0.00119 mg/kg	119	70.0	132
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	0.00116 mg/kg	94.8	68.0	136
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	0.0012 mg/kg	94.6	59.0	134
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5508734)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	0.00625 mg/kg	104	71.0	135
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	0.00125 mg/kg	116	69.0	132
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	0.00125 mg/kg	115	70.0	132
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	0.00125 mg/kg	102	71.0	131
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	109	69.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	108	72.0	129
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	0.00125 mg/kg	99.6	69.0	133
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	108	64.0	136
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	98.4	69.0	135
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	86.4	66.0	139
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	0.00125 mg/kg	103	69.0	133
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5508734)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	0.00125 mg/kg	105	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	0.00312 mg/kg	132	59.6	143
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	0.00312 mg/kg	102	62.8	140
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	0.00312 mg/kg	105	61.5	139
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	0.00312 mg/kg	110	61.9	139
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	0.00125 mg/kg	106	63.0	144
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	0.00125 mg/kg	105	61.0	139
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5508734)								

Sub-Matrix: **SOIL**

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: 5508734) - continued								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	0.00117 mg/kg	118	62.0	145
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	0.00118 mg/kg	112	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	0.0012 mg/kg	109	65.0	137
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	0.0012 mg/kg	113	54.8	124
EP231P: PFAS Sums (QCLot: 5508734)								
EP231X: Sum of PFAS	---	0.0002	mg/kg	<0.0002	---	---	---	---
EP231X: Sum of PFHxS and PFOS	355-46-4/17 63-23-1	0.0002	mg/kg	<0.0002	---	---	---	---
EP231X: Sum of PFAS (WA DER List)	---	0.0002	mg/kg	<0.0002	---	---	---	---

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: **SOIL**

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: 5508734)							
EP2317544-033	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0011 mg/kg	124	72.0	128
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.00117 mg/kg	# 144	73.0	123
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.00118 mg/kg	92.1	67.0	130
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.00119 mg/kg	107	70.0	132
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.00116 mg/kg	# Not Determined	68.0	136
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0012 mg/kg	114	59.0	134
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5508734)							
EP2317544-033	Anonymous	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.00625 mg/kg	122	71.0	135
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.00125 mg/kg	98.8	69.0	132
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.00125 mg/kg	104	70.0	132
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.00125 mg/kg	85.8	71.0	131
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.00125 mg/kg	85.1	69.0	133
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.00125 mg/kg	97.8	72.0	129
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.00125 mg/kg	94.0	69.0	133
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.00125 mg/kg	101	64.0	136
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.00125 mg/kg	106	69.0	135
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.00125 mg/kg	97.0	66.0	139
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.00125 mg/kg	109	69.0	133

Sub-Matrix: **SOIL**

				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: 5508734)							
EP2317544-033	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.00125 mg/kg	113	48.0	128
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.00312 mg/kg	119	60.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.00312 mg/kg	90.4	60.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.00312 mg/kg	99.7	60.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.00312 mg/kg	104	60.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.00125 mg/kg	106	63.0	144
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.00125 mg/kg	106	61.0	139
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5508734)							
EP2317544-033	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.00117 mg/kg	134	62.0	145
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.00118 mg/kg	105	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0012 mg/kg	101	65.0	137
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0012 mg/kg	108	60.0	130

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **EP2318016**	Page	: 1 of 5
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Telephone	: +61-8-9406 1301
Project	: WA_0089_PFASOMP_23	Date Samples Received	: 19-Dec-2023
Site	: Stirling SD - SC	Issue Date	: 02-Jan-2024
Sampler	: [redacted]	No. of samples received	: 6
Order number	: pfas-omp/Stirling	No. of samples analysed	: 6

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.**
- **Matrix Spike outliers exist - please see following pages for full details.**
- **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.**

Outliers : Quality Control Samples

Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

Matrix: **SOIL**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
Matrix Spike (MS) Recoveries							
EP231A: Perfluoroalkyl Sulfonic Acids	EP2317544--033	Anonymous	**Perfluoropentane sulfonic acid (PFPeS)**	2706-91-4	144 %	73.0-123%	**Recovery greater than upper data quality objective**
EP231A: Perfluoroalkyl Sulfonic Acids	EP2317544--033	Anonymous	**Perfluorooctane sulfonic acid (PFOS)**	1763-23-1	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**

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: **SOIL**

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*
EA055: Moisture Content (Dried @ 105-110°C)							
HDPE Soil Jar (EA055)							
0089_SD357_231219, 0089_SD358_231219, 0089_SD356_231219, 0089_SD331_231219, 0089_SD329_231219, 0089_SD330_231219	**19-Dec-2023**	**---**	----	----	**27-Dec-2023**	02-Jan-2024	✓
EP231A: Perfluoroalkyl Sulfonic Acids							
HDPE Soil Jar (EP231X)							
0089_SD357_231219, 0089_SD358_231219, 0089_SD356_231219, 0089_SD331_231219, 0089_SD329_231219, 0089_SD330_231219	**19-Dec-2023**	**28-Dec-2023**	16 Jun 2024	✓	**28-Dec-2023**	06 Feb 2024	✓
EP231B: Perfluoroalkyl Carboxylic Acids							
HDPE Soil Jar (EP231X)							
0089 SD357 231219, 0089 SD358 231219, 0089 SD356 231219, 0089 SD331 231219, 0089 SD329 231219, 0089 SD330 231219	**19-Dec-2023**	**28-Dec-2023**	16-Jun-2024	✓	**28-Dec-2023**	06-Feb-2024	✓
EP231C: Perfluoroalkyl Sulfonamides							
HDPE Soil Jar (EP231X)							
0089_SD357_231219, 0089_SD358_231219, 0089_SD356_231219, 0089_SD331_231219, 0089_SD329_231219, 0089_SD330_231219	**19-Dec-2023**	**28-Dec-2023**	16-Jun-2024	✓	**28-Dec-2023**	06-Feb-2024	✓

Matrix: **SOIL**

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 Soil Jar (EP231X)							
0089_SD357_231219, 0089_SD358_231219, 0089_SD356_231219, 0089_SD331_231219, 0089_SD329_231219, 0089_SD330_231219	**19-Dec-2023**	**28-Dec-2023**	16-Jun-2024	✓	**28-Dec-2023**	06-Feb-2024	✓
EP231P: PFAS Sums							
HDPE Soil Jar (EP231X)							
0089_SD357_231219, 0089_SD358_231219, 0089_SD356_231219, 0089_SD331_231219, 0089_SD329_231219, 0089_SD330_231219	**19-Dec-2023**	**28-Dec-2023**	16-Jun-2024	✓	**28-Dec-2023**	06-Feb-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: **SOIL**

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)							
Moisture Content	EA055	1	8	**12.50**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	20	**5.00**	**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
Moisture Content	EA055	SOIL	In house: A gravimetric procedure based on weight loss over a 12 hour drying period at 105-110 degrees C. This method is compliant with NEPM Schedule B(3).
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	SOIL	In-house: Analysis of soils by solvent extraction followed by LC-Electrospray-MS-MS, Negative Mode using MRM using internal standard quantitation. Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to a portion of soil which is then extracted with MTBE and an ion pairing reagent. A portion of extract is exchanged into the analytical solvent mixture, combined with an equal volume reagent water and 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
QuECheRS Extraction of Solids	* ORG71	SOIL	In house: Sequential extractions with Acetonitrile/Methanol by shaking. Extraction efficiency aided by the addition of salts under acidic conditions. Where relevant, interferences from co-extracted organics are removed with dispersive clean-up media (dSPE). The extract is either diluted or concentrated and exchanged into the analytical solvent.

CHAIN OF CUSTODY

(ALS) COC#: 61802 *ALS Laboratory:* EP Perth Environmental

RELINQUISHED BY:	RECEIVED BY [redacted]	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME: 19/12 1630	DATE TIME:	DATE TIME:

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP_23

SITE: Stirling GW - SC

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER:

CONTACT PH: [redacted]

QUOTE NO: SY/139/19 B

SAMPLER MOBILE: [redacted] / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO:

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	Rinsate WATER	WA OMP Water Suite WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
001	0089_MW139	Lab QCs added	19/12/2023 09:13 AM	WATER	ALS: 5 Non ALS: 0	No		X		
002	0089_MW141		19/12/2023 09:34 AM	WATER	ALS: 3 Non ALS: 0	No		X		
003	0089_MW142		19/12/2023 09:46 AM	WATER	ALS: 3 Non ALS: 0	No		X		
004	0089_MW147		19/12/2023 09:58 AM	WATER	ALS: 3 Non ALS: 0	No		X		
005	0089_MW149		19/12/2023 10:19 AM	WATER	ALS: 3 Non ALS: 0	No		X		
006	0089_QC301		19/12/2023 12:17 PM	WATER	ALS: 2 Non ALS: 0	No	X			
007	0089_QC401		19/12/2023 12:18 PM	WATER	ALS: 2 Non ALS: 0	No	X			

Environmental Division Perth

Work Order Reference

EP2318017

Telephone - 61-8-9406 1301

CHAIN OF CUSTODY

COC#: 61802 ALS Laboratory: EP Perth Environmental

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

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP_23

SITE: Stirling GW - SC

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES 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	0089_MW139	Clear Plastic Bottle - Natural	125 mL	00070522229613	Green	No	
001	0089_MW139	HDPE (no PTFE)	20 mL	00352309068141	Grey	No	
001	0089_MW139	HDPE (no PTFE)	20 mL	00352309068407	Grey	No	
001	0089_MW139	HDPE (no PTFE)	20 mL	00352309068267	Grey	No	
001	0089_MW139	HDPE (no PTFE)	20 mL	00352309068275	Grey	No	
002	0089_MW141	Clear Plastic Bottle - Natural	125 mL	00070522229760	Green	No	
002	0089_MW141	HDPE (no PTFE)	20 mL	00352309068131	Grey	No	
002	0089_MW141	HDPE (no PTFE)	20 mL	00352309068051	Grey	No	
003	0089_MW142	Clear Plastic Bottle - Natural	125 mL	00070522229769	Green	No	
003	0089_MW142	HDPE (no PTFE)	20 mL	00352309068102	Grey	No	
003	0089_MW142	HDPE (no PTFE)	20 mL	00352309068208	Grey	No	
004	0089_MW147	Clear Plastic Bottle - Natural	125 mL	00070522229756	Green	No	
004	0089_MW147	HDPE (no PTFE)	20 mL	00352309068251	Grey	No	
004	0089_MW147	HDPE (no PTFE)	20 mL	00352309067977	Grey	No	
005	0089_MW149	Clear Plastic Bottle - Natural	125 mL	00070522229776	Green	No	
005	0089_MW149	HDPE (no PTFE)	20 mL	00352309068161	Grey	No	
005	0089_MW149	HDPE (no PTFE)	20 mL	00352309068132	Grey	No	
006	0089_QC301	HDPE (no PTFE)	20 mL	00352309068289	Grey	No	
006	0089_QC301	HDPE (no PTFE)	20 mL	00352309068283	Grey	No	
007	0089_QC401	HDPE (no PTFE)	20 mL	00352309068243	Grey	No	
007	0089_QC401	HDPE (no PTFE)	20 mL	00352309068206	Grey	No	

Total Bottle Count: ALS: 21, Non ALS: 0

SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : **EP2318017**

Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: Customer Services EP
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
E-mail	: [redacted]stantec.com	E-mail	: ALSEnviro.Perth@alsglobal.com
Telephone	: ----	Telephone	: +61-8-9406 1301
Facsimile	: ----	Facsimile	: +61-8-9406 1399
Project	: WA_0089_PFASOMP_23	Page	: 1 of 2
Order number	: pfas-omp/Stirling	Quote number	: ES2022MWHAUS0002 (SY/139/19 B)
C-O-C number	: 61802	QC Level	: NEPM 2013 B3 & ALS QC Standard
Site	: Stirling GW - SC		
Sampler	: [redacted]		

Dates

Date Samples Received	: 19-Dec-2023 16:30	Issue Date	: 20-Dec-2023
Client Requested Due Date	: 02-Jan-2024	Scheduled Reporting Date	: **02-Jan-2024**

Delivery Details

Mode of Delivery	: Carrier	Security Seal	: Intact.
No. of coolers/boxes	: 1	Temperature	: 8.2 - Ice present
Receipt Detail	:	No. of samples received / analysed	: 7 / 7

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 see scanned COC for sample discrepencies: extra samples , samples not received etc.
- Please direct any queries related to sample condition / numbering / breakages to Sample Receipt (Samples.Perth@alsglobal.com)
- Analytical work for this work order will be conducted at ALS Environmental Perth.
- Please direct any turnaround / technical queries to the laboratory contact designated above.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months) from receipt of samples.
- **pH analysis should be conducted within 6 hours of sampling.**
- **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.**
- 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.**

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

EP2318017-001 : 19-Dec-2023 09:13 : 0089_MW139_231219 - Lab QCs added

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)	WATER - NT-01 & 02 Ca, Mg, Na, K, Cl, SO4, Alkalinity
EP2318017-001	19-Dec-2023 09:13	0089_MW139_231219 L...	✓	✓
EP2318017-002	19-Dec-2023 09:34	0089_MW141_231219	✓	✓
EP2318017-003	19-Dec-2023 09:46	0089_MW142_231219	✓	✓
EP2318017-004	19-Dec-2023 09:58	0089_MW147_231219	✓	✓
EP2318017-005	19-Dec-2023 10:19	0089_MW149_231219	✓	✓
EP2318017-006	19-Dec-2023 12:17	0089_QC301_231219	✓	
EP2318017-007	19-Dec-2023 12:18	0089_QC401_231219	✓	

Proactive Holding Time Report

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

Requested Deliverables

[redacted]
- A4 - AU Tax Invoice (INV) — Email — [redacted]cardno.com.au

DERP LAB REPORTS
- EDI Format - ESDAT (ESDAT) — Email — derp.labreports@esdat.com.au

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

CERTIFICATE OF ANALYSIS

Work Order	: **EP2318017**	Page	: 1 of 8
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: Customer Services EP
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: +61-8-9406 1301
Project	: WA_0089_PFASOMP_23	Date Samples Received	: 19-Dec-2023 16:30
Order number	: pfas-omp/Stirling	Date Analysis Commenced	: 21-Dec-2023
C-O-C number	: 61802	Issue Date	: 02-Jan-2024 14:59
Sampler	: [redacted]		
Site	: Stirling GW - SC		
Quote number	: SY/139/19 B		
No. of samples received	: 7		
No. of samples analysed	: 7		

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]	Inorganics Supervisor	Perth Inorganics, Wangara, WA
[redacted]	SENIOR LAB TECH	Perth Organics, Wangara, WA

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.
- As per QWI – EN55-3 Data Interpreting Procedures, Ionic balances are typically calculated using Major Anions - Chloride, Alkalinity and Sulfate; and Major Cations - Calcium, Magnesium, Potassium and Sodium. Where applicable and dependent upon sample matrix, the Ionic Balance may also include the additional contribution of Ammonia, Dissolved Metals by ICPMS and H+ to the Cations and Nitrate, SiO2 and Fluoride to the Anions.
- Sodium Adsorption Ratio (where reported): Where results for Na, Ca or Mg are <LOR, a concentration at half the reported LOR is incorporated into the SAR calculation. This represents a conservative approach for Na relative to the assumption that <LOR = zero concentration and a conservative approach for Ca & Mg relative to the assumption that <LOR is equivalent to the LOR concentration.
- 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.
- ED045G: The presence of Thiocyanate, Thiosulfate and Sulfite can positively contribute to the chloride result, thereby may bias results higher than expected. Results should be scrutinised accordingly.

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW139_231219 Lab QCs added	0089_MW141_231219	0089_MW142_231219	0089_MW147_231219	0089_MW149_231219
				Sampling date / time	19-Dec-2023 09:13	19-Dec-2023 09:34	19-Dec-2023 09:46	19-Dec-2023 09:58	19-Dec-2023 10:19
Compound	CAS Number	LOR	Unit		EP2318017-001	EP2318017-002	EP2318017-003	EP2318017-004	EP2318017-005
					Result	Result	Result	Result	Result
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	<1	<1	<1	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	<1	<1	<1	<1
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		204	586	458	355	484
Total Alkalinity as CaCO3	---	1	mg/L		204	586	458	355	484
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		87	976	1350	1440	1200
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		913	8190	10800	10300	6510
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		124	334	379	320	234
Magnesium	7439-95-4	1	mg/L		67	548	741	729	534
Sodium	7440-23-5	1	mg/L		472	4010	5350	5230	3660
Potassium	7440-09-7	1	mg/L		25	153	266	270	194
EN055: Ionic Balance									
ø Total Anions	---	0.01	meq/L		31.6	263	342	328	218
ø Total Cations	---	0.01	meq/L		32.9	240	319	310	220
ø Ionic Balance	---	0.01	%		1.91	4.56	3.40	2.70	0.34
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		<0.02	0.53	0.15	<0.02	<0.02
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		<0.02	0.89	0.22	<0.02	<0.02
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		<0.01	16.6	4.33	0.02	<0.01
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		<0.02	0.80	0.14	<0.02	<0.02
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		<0.01	49.5	4.39	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

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW139_231219 Lab QCs added	0089_MW141_231219	0089_MW142_231219	0089_MW147_231219	0089_MW149_231219
				Sampling date / time	19-Dec-2023 09:13	19-Dec-2023 09:34	19-Dec-2023 09:46	19-Dec-2023 09:58	19-Dec-2023 10:19
Compound	CAS Number	LOR	Unit		EP2318017-001	EP2318017-002	EP2318017-003	EP2318017-004	EP2318017-005
					Result	Result	Result	Result	Result
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		<0.1	**0.3**	<0.1	<0.1	<0.1
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		<0.02	**1.13**	**0.26**	<0.02	<0.02
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		<0.02	**14.9**	**2.82**	<0.02	<0.02
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		<0.02	**0.39**	**0.08**	<0.02	<0.02
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		<0.01	**1.06**	**0.30**	<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
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									

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW139_231219 Lab QCs added	0089_MW141_231219	0089_MW142_231219	0089_MW147_231219	0089_MW149_231219
				Sampling date / time	19-Dec-2023 09:13	19-Dec-2023 09:34	19-Dec-2023 09:46	19-Dec-2023 09:58	19-Dec-2023 10:19
Compound	CAS Number	LOR	Unit		EP2318017-001	EP2318017-002	EP2318017-003	EP2318017-004	EP2318017-005
					Result	Result	Result	Result	Result
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
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	**86.1**	**12.7**	**0.03**	<0.01
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		<0.01	**66.1**	**8.72**	**0.03**	<0.01
Sum of PFAS (WA DER List)	---	0.01	µg/L		<0.01	**84.4**	**12.3**	**0.03**	<0.01
EP231S: PFAS Surrogate									
13C4-PFOS	---	0.02	%		**106**	**94.3**	**96.9**	**95.8**	**102**
13C8-PFOA	---	0.02	%		**100**	**98.8**	**100**	**102**	**98.0**

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_QC301_231219	0089_QC401_231219	----	----	----
				Sampling date / time	19-Dec-2023 12:17	19-Dec-2023 12:18	----	----	----
Compound	CAS Number	LOR	Unit		EP2318017-006	EP2318017-007	--------	--------	--------
					Result	Result	----	----	----
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		<0.01	<0.01	----	----	----
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		<0.01	<0.01	----	----	----
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	<0.02	----	----	----
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		<0.1	<0.1	----	----	----
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		<0.01	<0.01	----	----	----
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		<0.05	<0.05	----	----	----
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L		<0.02	<0.02	----	----	----
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L		<0.05	<0.05	----	----	----

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_QC301_231219	0089_QC401_231219	----	----	----
				Sampling date / time	19-Dec-2023 12:17	19-Dec-2023 12:18	----	----	----
Compound	CAS Number	LOR	Unit		EP2318017-006	EP2318017-007	--------	--------	--------
					Result	Result	----	----	----
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L		<0.05	<0.05	----	----	----
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L		<0.05	<0.05	----	----	----
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L		<0.05	<0.05	----	----	----
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L		<0.02	<0.02	----	----	----
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L		<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	----	----	----
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		<0.05	<0.05	----	----	----
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		<0.05	<0.05	----	----	----
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L		<0.05	<0.05	----	----	----
EP231P: PFAS Sums									
Sum of PFAS	---	0.01	µg/L		<0.01	<0.01	----	----	----
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		<0.01	<0.01	----	----	----
Sum of PFAS (WA DER List)	---	0.01	µg/L		<0.01	<0.01	----	----	----
EP231S: PFAS Surrogate									
13C4-PFOS	---	0.02	%		**107**	**103**	----	----	----
13C8-PFOA	---	0.02	%		**100**	**99.4**	----	----	----

Surrogate Control Limits

Sub-Matrix: GROUNDWATER		Recovery Limits (%)	
Compound	CAS Number	Low	High
EP231S: PFAS Surrogate			
13C4-PFOS	---	65	140
13C8-PFOA	---	71	133

QUALITY CONTROL REPORT

Work Order	: **EP2318017**	Page	: 1 of 10
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: Customer Services EP
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: +61-8-9406 1301
Project	: WA_0089_PFASOMP_23	Date Samples Received	: 19-Dec-2023
Order number	: pfas-omp/Stirling	Date Analysis Commenced	: 21-Dec-2023
C-O-C number	: 61802	Issue Date	: 02-Jan-2024
Sampler	: [redacted] [redacted]		
Site	: Stirling GW - SC		
Quote number	: SY/139/19 B		
No. of samples received	: 7		
No. of samples analysed	: 7		

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]	Inorganics Supervisor	Perth Inorganics, Wangara, WA
[redacted]	SENIOR LAB TECH	Perth Organics, Wangara, WA

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 (%)
ED037P: Alkalinity by PC Titrator (QC Lot: 5518616)									
EP2317733-001	Anonymous	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	357	361	1.2	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	357	361	1.2	0% - 20%
EP2318063-010	Anonymous	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	294	294	0.0	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	294	294	0.0	0% - 20%
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QC Lot: 5511202)									
EP2318060-004	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	31	31	0.0	0% - 20%
EP2318017-001	0089_MW139_231219 Lab QCs added	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	87	97	11.0	0% - 20%
ED045G: Chloride by Discrete Analyser (QC Lot: 5511201)									
EP2318060-004	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	44	43	2.8	0% - 20%
EP2318017 001	0089_MW139_231219 Lab QCs added	ED045G: Chloride	16887 00 6	1	mg/L	913	923	1 1	0% 20%
ED093F: Dissolved Major Cations (QC Lot: 5510350)									
EP2318014-001	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	548	539	1.7	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	1670	1650	1.3	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	12700	12600	1.0	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	693	680	1.9	0% - 20%
EP2318017-001	0089_MW139_231219 Lab QCs added	ED093F: Calcium	7440-70-2	1	mg/L	124	125	0.9	0% - 20%

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 (%)
ED093F: Dissolved Major Cations (QC Lot: 5510350) - continued									
EP2318017-001	0089_MW139_231219 Lab QCs added	ED093F: Magnesium	7439-95-4	1	mg/L	67	68	1.5	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	472	479	1.5	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	25	25	0.0	0% - 20%
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 5513195)									
EP2318014-002	Anonymous	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
EP2318017-001	0089_MW139_231219 Lab QCs added	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
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 5513195)									
EP2318014-002	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
EP2318017-001	0089_MW139_231219 Lab QCs added	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

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 (%)
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 5513195) - continued									
EP2318017-001	0089_MW139_231219 Lab QCs added	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: 5513195)									
EP2318014-002	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
EP2318017-001	0089_MW139_231219 Lab QCs added	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: 5513195)									
EP2318014-002	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

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: 5513195) - continued									
EP2318014-002	Anonymous	EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP2318017-001	0089_MW139_231219 Lab QCs added	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: 5513195)									
EP2318014-002	Anonymous	EP231X: Sum of PFAS	----	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	<0.01	<0.01	0.0	No Limit
EP2318017-001	0089_MW139_231219 Lab QCs added	EP231X: Sum of PFAS	----	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	<0.01	<0.01	0.0	No Limit

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
ED037P: Alkalinity by PC Titrator (QCLot: 5518616)								
ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	---	---	---	---
ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	---	---	---	---
ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	<1	---	---	---	---
ED037-P: Total Alkalinity as CaCO3	---	1	mg/L	<1	20 mg/L	111	85.1	126
				<1	200 mg/L	103	90.5	111
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 5511202)								
ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<1	25 mg/L	101	89.9	112
				<1	500 mg/L	107	89.9	112
ED045G: Chloride by Discrete Analyser (QCLot: 5511201)								
ED045G: Chloride	16887-00-6	1	mg/L	<1	10 mg/L	101	88.6	113
				<1	1000 mg/L	101	88.6	113
ED093F: Dissolved Major Cations (QCLot: 5510350)								
ED093F: Calcium	7440-70-2	1	mg/L	<1	50 mg/L	101	86.5	117
ED093F: Magnesium	7439-95-4	1	mg/L	<1	50 mg/L	100	88.4	110
ED093F: Sodium	7440-23-5	1	mg/L	<1	50 mg/L	97.7	91.4	113
ED093F: Potassium	7440-09-7	1	mg/L	<1	50 mg/L	96.2	84.6	108
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5513188)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.2218 µg/L	94.0	72.0	130
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.2352 µg/L	87.2	71.0	127
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	0.2373 µg/L	104	68.0	131
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.238 µg/L	100	69.0	134
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.232 µg/L	92.2	65.0	140
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.241 µg/L	101	53.0	142
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5513195)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.2218 µg/L	93.1	72.0	130
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.2352 µg/L	84.0	71.0	127
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	0.2373 µg/L	96.1	68.0	131
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.238 µg/L	99.2	69.0	134
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.232 µg/L	90.1	65.0	140
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.241 µg/L	88.0	53.0	142

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: 5513188)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	1.25 µg/L	105	73.0	129
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	0.25 µg/L	102	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	102	72.0	130
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	0.25 µg/L	97.6	71.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	0.25 µg/L	94.8	69.0	130
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	0.25 µg/L	98.2	71.0	129
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	0.25 µg/L	96.2	69.0	133
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	0.25 µg/L	97.0	72.0	134
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	0.25 µg/L	93.4	65.0	144
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	0.25 µg/L	106	71.0	132
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5513195)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	1.25 µg/L	94.2	73.0	129
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	0.25 µg/L	95.2	72.0	129
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	0.25 µg/L	98.6	72.0	129
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	0.25 µg/L	88.2	72.0	130
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	0.25 µg/L	95.2	71.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	0.25 µg/L	91.2	69.0	130
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	0.25 µg/L	97.2	71.0	129
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	0.25 µg/L	97.8	69.0	133
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	0.25 µg/L	76.4	72.0	134
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	0.25 µg/L	84.6	65.0	144
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	0.25 µg/L	99.4	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5513188)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.25 µg/L	94.8	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	0.625 µg/L	127	68.0	141
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	0.625 µg/L	107	60.5	138
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	0.625 µg/L	111	68.3	134
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	0.625 µg/L	93.4	62.2	138
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	0.25 µg/L	97.4	65.0	136
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	0.25 µg/L	102	61.0	135

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: 5513195)								
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	109	68.0	141
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	0.625 µg/L	95.8	60.5	138
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	0.625 µg/L	112	68.3	134
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	0.625 µg/L	91.0	62.2	138
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	0.25 µg/L	97.0	65.0	136
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	0.25 µg/L	101	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5513188)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.2343 µg/L	116	63.0	143
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	0.2378 µg/L	110	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	0.24 µg/L	101	67.0	138
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	0.241 µg/L	97.7	64.2	133
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5513195)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.2343 µg/L	102	63.0	143
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	0.2378 µg/L	100	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	0.24 µg/L	99.8	67.0	138
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	0.241 µg/L	83.2	64.2	133
EP231P: PFAS Sums (QCLot: 5513188)								
EP231X: Sum of PFAS	---	0.01	µg/L	<0.01	---	---	---	---
EP231X: Sum of PFHxS and PFOS	355-46-4/17 63-23-1	0.01	µg/L	<0.01	---	---	---	---
EP231X: Sum of PFAS (WA DER List)	---	0.01	µg/L	<0.01	---	---	---	---
EP231P: PFAS Sums (QCLot: 5513195)								
EP231X: Sum of PFAS	---	0.01	µg/L	<0.01	---	---	---	---
EP231X: Sum of PFHxS and PFOS	355-46-4/17 63-23-1	0.01	µg/L	<0.01	---	---	---	---
EP231X: Sum of PFAS (WA DER List)	---	0.01	µg/L	<0.01	---	---	---	---

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**

Matrix Spike (MS) Report

Sub-Matrix: **WATER**

Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report: Spike Concentration	Matrix Spike (MS) Report: SpikeRecovery(%) MS	Matrix Spike (MS) Report: Acceptable Limits (%) Low	Matrix Spike (MS) Report: Acceptable Limits (%) High
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 5511202)							
EP2318017-001	0089_MW139_231219 Lab QCs added	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	100 mg/L	107	70.4	130
ED045G: Chloride by Discrete Analyser (QCLot: 5511201)							
EP2317931-014	Anonymous	ED045G: Chloride	16887-00-6	200 mg/L	# Not Determined	70.0	130
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5513195)							
EP2318014-010	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.2218 µg/L	94.0	72.0	129
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.232 µg/L	85.8	71.0	127
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.2352 µg/L	102	68.0	129
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.238 µg/L	102	69.0	134
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.232 µg/L	99.6	65.0	140
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.241 µg/L	92.1	53.0	129
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5513195)							
EP2318014-010	Anonymous	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	1.25 µg/L	92.3	73.0	142
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.25 µg/L	104	72.0	129
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.25 µg/L	99.0	72.0	129
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.25 µg/L	95.0	72.0	130
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.25 µg/L	100	71.0	133
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.25 µg/L	98.0	69.0	130
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.25 µg/L	103	71.0	134
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.25 µg/L	111	69.0	133
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.25 µg/L	83.6	72.0	134
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.25 µg/L	79.0	65.0	144
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.25 µg/L	98.4	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5513195)							
EP2318014-010	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.25 µg/L	97.0	59.0	135
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.625 µg/L	106	70.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.625 µg/L	96.5	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.625 µg/L	101	70.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.625 µg/L	98.5	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.25 µg/L	95.8	65.0	136
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.25 µg/L	102	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5513195)							
EP2318014-010	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.234 µg/L	111	63.0	143

Sub-Matrix: **WATER**

Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report: Spike Concentration	Matrix Spike (MS) Report: SpikeRecovery(%) MS	Matrix Spike (MS) Report: Acceptable Limits (%) Low	Matrix Spike (MS) Report: Acceptable Limits (%) High
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5513195) - continued							
EP2318014-010	Anonymous	EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.2378 µg/L	113	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.24 µg/L	104	67.0	138
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.2415 µg/L	83.9	70.0	130

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **EP2318017**	Page	: 1 of 5
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Telephone	: +61-8-9406 1301
Project	: WA_0089_PFASOMP_23	Date Samples Received	: 19-Dec-2023
Site	: Stirling GW - SC	Issue Date	: 02-Jan-2024
Sampler	: [redacted]	No. of samples received	: 7
Order number	: pfas-omp/Stirling	No. of samples analysed	: 7

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.**
- **Matrix Spike outliers exist - please see following pages for full details.**
- **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 : Quality Control Samples

Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

Matrix: **WATER**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
Matrix Spike (MS) Recoveries							
ED045G: Chloride by Discrete Analyser	EP2317931--014	Anonymous	**Chloride**	16887-00-6	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**

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	2	22	9.09	10.00	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)						
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	22	4.55	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*			*Analysis*		
			Date extracted	*Due for extraction*	*Evaluation*	*Date analysed*	*Due for analysis*	*Evaluation*
ED037P: Alkalinity by PC Titrator								
Clear Plastic Bottle - Natural (ED037-P)								
0089_MW139_231219 - Lab QCs added,	0089_MW141_231219,	**19-Dec-2023**	**----**	----	----	**29-Dec-2023**	02-Jan-2024	✓
0089_MW142_231219,	0089_MW147_231219,							
0089_MW149_231219								
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA								
Clear Plastic Bottle - Natural (ED041G)								
0089_MW139_231219 - Lab QCs added,	0089_MW141_231219,	**19-Dec-2023**	**----**	----	----	**02-Jan-2024**	16-Jan-2024	✓
0089_MW142_231219,	0089_MW147_231219,							
0089_MW149_231219								
ED045G: Chloride by Discrete Analyser								
Clear Plastic Bottle - Natural (ED045G)								
0089_MW139_231219 - Lab QCs added,	0089_MW141_231219,	**19-Dec-2023**	**----**	----	----	**02-Jan-2024**	16-Jan-2024	✓
0089_MW142_231219,	0089_MW147_231219,							
0089_MW149_231219								

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
ED093F: Dissolved Major Cations							
Clear Plastic Bottle - Natural (ED093F)							
0089_MW139_231219 - Lab QCs added, 0089_MW141_231219, 0089_MW142_231219, 0089_MW147_231219, 0089_MW149_231219	**19-Dec-2023**	**----**	----	----	**21-Dec-2023**	26-Dec-2023	✓
EP231A: Perfluoroalkyl Sulfonic Acids							
HDPE (no PTFE) (EP231X)							
0089_MW139_231219 - Lab QCs added, 0089_MW141_231219, 0089_MW142_231219, 0089_MW147_231219, 0089_MW149_231219, 0089_QC301_231219, 0089_QC401_231219	**19-Dec-2023**	**22-Dec-2023**	16-Jun-2024	✓	**22-Dec-2023**	16-Jun-2024	✓
EP231B: Perfluoroalkyl Carboxylic Acids							
HDPE (no PTFE) (EP231X)							
0089_MW139_231219 - Lab QCs added, 0089_MW141_231219, 0089_MW142_231219, 0089_MW147_231219, 0089_MW149_231219, 0089_QC301_231219, 0089_QC401_231219	**19-Dec-2023**	**22-Dec-2023**	16-Jun-2024	✓	**22-Dec-2023**	16-Jun-2024	✓
EP231C: Perfluoroalkyl Sulfonamides							
HDPE (no PTFE) (EP231X)							
0089_MW139_231219 - Lab QCs added, 0089_MW141_231219, 0089_MW142_231219, 0089_MW147_231219, 0089_MW149_231219, 0089_QC301_231219, 0089_QC401_231219	**19-Dec-2023**	**22-Dec-2023**	16-Jun-2024	✓	**22-Dec-2023**	16-Jun-2024	✓
EP231D: (n:2) Fluorotelomer Sulfonic Acids							
HDPE (no PTFE) (EP231X)							
0089_MW139_231219 - Lab QCs added, 0089_MW141_231219, 0089_MW142_231219, 0089_MW147_231219, 0089_MW149_231219, 0089_QC301_231219, 0089_QC401_231219	**19-Dec-2023**	**22-Dec-2023**	16-Jun-2024	✓	**22-Dec-2023**	16-Jun-2024	✓
EP231P: PFAS Sums							
HDPE (no PTFE) (EP231X)							
0089_MW139_231219 - Lab QCs added, 0089_MW141_231219, 0089_MW142_231219, 0089_MW147_231219, 0089_MW149_231219, 0089_QC301_231219, 0089_QC401_231219	**19-Dec-2023**	**22-Dec-2023**	16-Jun-2024	✓	**22-Dec-2023**	16-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)							
Alkalinity by Auto Titrator	ED037-P	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	19	**10.53**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	2	19	**10.53**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	22	**9.09**	**10.00**	×	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	18	**11.11**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Alkalinity by Auto Titrator	ED037-P	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	19	**10.53**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	1	19	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	22	**9.09**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	18	**11.11**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Alkalinity by Auto Titrator	ED037-P	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	1	19	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	1	19	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	22	**9.09**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	18	**5.56**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Chloride by Discrete Analyser	ED045G	1	19	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	22	**4.55**	**5.00**	×	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	18	**5.56**	**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
Alkalinity by Auto Titrator	ED037-P	WATER	In house: Referenced to APHA 2320 B This procedure determines alkalinity by automated measurement (e.g. PC Titrate) on a settled supernatant aliquot of the sample using pH 4.5 for indicating the total alkalinity end-point. This method is compliant with NEPM Schedule B(3)
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	WATER	In house: Referenced to APHA 4500-SO4. Dissolved sulfate is determined in a 0.45um filtered sample. Sulfate ions are converted to a barium sulfate suspension in an acetic acid medium with barium chloride. Light absorbance of the BaSO4 suspension is measured by a photometer and the SO4-2 concentration is determined by comparison of the reading with a standard curve. This method is compliant with NEPM Schedule B(3)
Chloride by Discrete Analyser	ED045G	WATER	In house: Referenced to APHA 4500 Cl - G.The thiocyanate ion is liberated from mercuric thiocyanate through sequestration of mercury by the chloride ion to form non-ionised mercuric chloride. In the presence of ferric ions the liberated thiocynate forms highly-coloured ferric thiocynate which is measured at 480 nm.
Major Cations - Dissolved	ED093F	WATER	In house: Referenced to APHA 3120 and 3125; USEPA SW 846 - 6010 and 6020; Cations are determined by either ICP-AES or ICP-MS techniques. This method is compliant with NEPM Schedule B(3) Sodium Adsorption Ratio is calculated from Ca, Mg and Na which determined by ALS in house method QWI-EN/ED093F. This method is compliant with NEPM Schedule B(3) Hardness parameters are calculated based on APHA 2340 B. This method is compliant with NEPM Schedule B(3)
Ionic Balance by PCT DA and Turbi SO4 DA	* EN055 - PG	WATER	In house: Referenced to APHA 1030F. This method is compliant with NEPM Schedule B(3)
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.

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Email: enquiries.melb@mgtlabmark.com.au

CHAIN OF CUSTODY RECORD

CLIENT DETAILS

Company Name : Stantec Australia	Contact Name [redacted]	Purchase Order : 304700525/730	COC Number : 304700525/730 -03
Office Address : GF, 226 Adelaide Terrace, Perth WA 6000		PROJECT Number : WA_0089_PFASOMP_23	Eurofins | mgt quote ID :
	Email for COC/SRN/Results : [redacted] derp.labreports@esdat.com.au	PROJECT Name : WA_0089_PFASOMP_23	Data output format: PDF, ESDAT

Special Directions & Comments :
Please send ESdat files to derp.labreports@esdat.com.au with the project No in the header file

Please send invoice to SAPinvoices@stantec.com

Eurofins | mgt DI water batch number:

Some common holding times (with correct preservation).
For further information contact the lab

Waters		Soils	
BTEX, MAH, VOC	14 days	BTEX, MAH, VOC	14 days
TRH, PAH, Phenols, Pesticides	7 days	TRH, PAH, Phenols, Pesticides	14 days
Heavy Metals	6 months	Heavy Metals	6 months
Mercury, CrVI	28 days	Mercury, CrVI	28 days
Microbiological testing	24 hours	Microbiological testing	72 hours
BOD, Nitrate, Nitrite, Total N	2 days	Anions	28 days
Solids - TSS, TDS etc	7 days	SPOCAS, pH Field and FOX, CrS	24 hours
Ferrous iron	7 days	ASLP, TCLP	7 days

	Sample ID	Date	Matrix	Analytes: PFAS (28 analytes)	Containers: 1LP	250P	125P	1LA	40mL vial	125mL A	Jar		Sample comments
1	0089_QC201_231211	11/12/2023	Soil	X									
2	0089_QC202_231211	11/12/2023	Water	X									
3	0089_QC203_231211	11/12/2023	Water	X									
4	0089_QC204_231211	11/12/2023	Water	X									
5	0089_QC205_231211	11/12/2023	Soil	X									
6	0089_QC206_231211	11/12/2023	Water	X									
7	0089_QC207_231211	11/12/2023	Water	X									
8	0089_QC208_231212	12/12/2023	Water	X									
9	0089_QC209_231212	12/12/2023	Water	X									
10	0089_QC210_231212	12/12/2023	Water	X									
11	0089_QC211_231212	12/12/2023	Soil	X									
12	0089_QC212_231212	12/12/2023	Water	X									
13	0089_QC213_231212	12/12/2023	Water	X									
14	0089_QC214_231213	13/12/2023	Water	X									
15	0089_QC215_231213	13/12/2023	Water	X									
16	0089_QC216_231213	13/12/2023	Soil	X									
17	0089_QC217_231213	13/12/2023	Water	X									
18	0089_QC218_231213	13/12/2023	Water	X									

Relinquished By: Stantec Australia	Received By: [redacted]	Turn around time	Method Of Shipment
Date & Time : 13/12/23 2.30pm	Date & Time : 13/12/23 16:30	1 DAY ☐ 2 DAY ☐ 3 DAY ☐	☑ Courier ☐ Hand Delivered ☐ Postal
Signature:	Signature: [redacted]	STANDARD ☑ Other:	Courier Consignment # :

Temperature on arrival:

Report number: 1053798

www.eurofins.com.au EnviroSales@eurofins.com

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Sample Receipt Advice

Company name:	Stantec Australia Pty Ltd (WA)
Contact name:	[redacted]
Project name:	WA_0089_PFASOMP_23
Project ID:	WA_0089_PFASOMP_23
Turnaround time:	5 Day
Date/Time received	Dec 13, 2023 4:30 PM
Eurofins reference	1053798

Sample Information

✓	A detailed list of analytes logged into our LIMS, is included in the attached summary table.
✓	All samples have been received as described on the above COC.
✓	COC has been completed correctly.
✓	Attempt to chill was evident.
✓	Appropriately preserved sample containers have been used.
✓	All samples were received in good condition.
✓	Samples have been provided with adequate time to commence analysis in accordance with the relevant holding times.
✓	Appropriate sample containers have been used.
N/A	Sample containers for volatile analysis received with zero headspace.
X	Split sample sent to requested external lab.
X	Some samples have been subcontracted.
N/A	Custody Seals intact (if used).

Notes

Sample QC215 was written on the soil jar instead of QC216, which is missing. Assuming this was a typo? Please advise.

Contact

If you have any questions with respect to these samples, please contact your Analytical Services Manager:

[redacted]

Results will be delivered electronically via email to [redacted] - [redacted] stantec.com.

Note: A copy of these results will also be delivered to the general Stantec Australia Pty Ltd (WA) email address.

Global Leader - Results you can trust

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Company Name: Stantec Australia Pty Ltd (WA)
Address: 6F 226,Adelaide Terrace
Perth
WA 6000

Project Name: WA_0089_PFASOMP_23
Project ID: WA_0089_PFASOMP_23

Order No.: 304700525/730
Report #: 1053798
Phone: [redacted]
Fax:

Received: Dec 13, 2023 4:30 PM
Due: Dec 20, 2023
Priority: 5 Day
Contact Name: [redacted]

Eurofins Analytical Services Manager : [redacted]

Sample Detail						Moisture Set	Per- and Polyfluoroalkyl Substances (PFASs)
Melbourne Laboratory - NATA # 1261 Site # 1254						X	X
External Laboratory							
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**		
1	0089_QC201_231211	Dec 11, 2023		Soil	L23-De0032392	X	X
2	0089_QC202_231211	Dec 11, 2023		Water	L23-De0032393		X
3	0089_QC203_231211	Dec 11, 2023		Water	L23-De0032394		X
4	0089_QC204_231211	Dec 11, 2023		Water	L23-De0032395		X
5	0089_QC205_231211	Dec 11, 2023		Soil	L23-De0032396	X	X
6	0089_QC206_231211	Dec 11, 2023		Water	L23-De0032397		X
7	0089_QC207_231211	Dec 11, 2023		Water	L23-De0032398		X
8	0089_QC208_231212	Dec 12, 2023		Water	L23-De0032399		X

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Company Name: Stantec Australia Pty Ltd (WA)
Address: 6F 226,Adelaide Terrace
Perth
WA 6000

Project Name: WA_0089_PFASOMP_23
Project ID: WA_0089_PFASOMP_23

Order No.: 304700525/730
Report #: 1053798
Phone: [redacted]
Fax:

Received: Dec 13, 2023 4:30 PM
Due: Dec 20, 2023
Priority: 5 Day
Contact Name: [redacted]

Eurofins Analytical Services Manager : [redacted]

Sample Detail						Moisture Set	Per- and Polyfluoroalkyl Substances (PFASs)
Melbourne Laboratory - NATA # 1261 Site # 1254						X	X
9	0089_QC209_231212	Dec 12, 2023		Water	L23-De0032400		X
10	0089_QC210_231213	Dec 12, 2023		Water	L23-De0032401		X
11	0089_QC211_231212	Dec 12, 2023		Soil	L23-De0032402	X	X
12	0089_QC212_231212	Dec 12, 2023		Water	L23-De0032403		X
13	0089_QC213_231212	Dec 12, 2023		Water	L23-De0032404		X
14	0089_QC214_231213	Dec 13, 2023		Water	L23-De0032405		X
15	0089_QC215_231213	Dec 13, 2023		Water	L23-De0032406		X
16	0089_QC216_231213	Dec 13, 2023		Soil	L23-De0032407	X	X
17	0089_QC217_231213	Dec 13, 2023		Water	L23-De0032408		X
18	0089_QC218_	Dec 13, 2023		Water	L23-De0032409		X

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Order No.: 304700525/730
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Fax:

Received: Dec 13, 2023 4:30 PM
Due: Dec 20, 2023
Priority: 5 Day
Contact Name: [redacted]

Eurofins Analytical Services Manager : [redacted]

Sample Detail						Moisture Set	Per- and Polyfluoroalkyl Substances (PFASs)
Melbourne Laboratory - NATA # 1261 Site # 1254						X	X
18	0089_QC218_231213	Dec 13, 2023		Water	L23-De0032409		
Test Counts						4	18

Stantec Australia Pty Limited
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NATA Accredited
Accreditation Number 2377
Site Number 2370

Accredited for compliance with ISO/IEC 17025 – Testing
NATA is a signatory to the ILAC Mutual Recognition Arrangement for the mutual recognition of the equivalence of testing, medical testing, calibration, inspection, proficiency testing scheme providers and reference materials producers reports and certificates.

Attention: [redacted]

Report **1053798-S**
Project name WA_0089_PFASOMP_23
Project ID WA_0089_PFASOMP_23
Received Date Dec 13, 2023

Client Sample ID			**0089_QC201_231211**	**0089_QC205_231211**	**0089_QC211_231212**	**0089_QC216_231213**
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins Sample No.			**L23-De0032392**	**L23-De0032396**	**L23-De0032402**	**L23-De0032407**
Date Sampled			**Dec 11, 2023**	**Dec 11, 2023**	**Dec 12, 2023**	**Dec 13, 2023**
Test/Reference	LOR	Unit				
Sample Properties						
% Moisture	1	%	33	16	6.7	33
Perfluoroalkyl carboxylic acids (PFCAs)						
Perfluorobutanoic acid (PFBA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluoropentanoic acid (PFPeA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluorohexanoic acid (PFHxA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluoroheptanoic acid (PFHpA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluorooctanoic acid (PFOA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluorononanoic acid (PFNA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluorodecanoic acid (PFDA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluoroundecanoic acid (PFUnDA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluorododecanoic acid (PFDoDA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluorotridecanoic acid (PFTrDA)[N15]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluorotetradecanoic acid (PFTeDA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
13C4-PFBA (surr.)	1	%	56	55	57	50
13C5-PFPeA (surr.)	1	%	78	88	82	81
13C5-PFHxA (surr.)	1	%	93	102	94	90
13C4-PFHpA (surr.)	1	%	87	92	91	84
13C8-PFOA (surr.)	1	%	87	92	96	83
13C5-PFNA (surr.)	1	%	84	88	94	80
13C6-PFDA (surr.)	1	%	79	90	86	85
13C2-PFUnDA (surr.)	1	%	73	94	89	89
13C2-PFDoDA (surr.)	1	%	86	100	95	87
13C2-PFTeDA (surr.)	1	%	94	103	86	97
Perfluoroalkyl sulfonamido substances						
Perfluorooctane sulfonamide (FOSA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)[N11]	10	ug/kg	< 10	< 10	< 10	< 10
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)[N11]	10	ug/kg	< 10	< 10	< 10	< 10

Client Sample ID			0089_QC201_231211	0089_QC205_231211	0089_QC211_231212	0089_QC216_231213
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins Sample No.			**L23-De0032392**	**L23-De0032396**	**L23-De0032402**	**L23-De0032407**
Date Sampled			**Dec 11, 2023**	**Dec 11, 2023**	**Dec 12, 2023**	**Dec 13, 2023**
Test/Reference	LOR	Unit				
Perfluoroalkyl sulfonamido substances						
13C8-FOSA (surr.)	1	%	72	73	78	77
D3-N-MeFOSA (surr.)	1	%	58	57	63	60
D5-N-EtFOSA (surr.)	1	%	140	117	100	122
D7-N-MeFOSE (surr.)	1	%	108	122	124	104
D9-N-EtFOSE (surr.)	1	%	92	92	86	91
D5-N-EtFOSAA (surr.)	1	%	78	85	88	72
D3-N-MeFOSAA (surr.)	1	%	109	113	113	92
Perfluoroalkyl sulfonic acids (PFSAs)						
Perfluorobutanesulfonic acid (PFBS)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluorononanesulfonic acid (PFNS)[N15]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluoropropanesulfonic acid (PFPrS)[N15]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluoropentanesulfonic acid (PFPeS)[N15]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluorohexanesulfonic acid (PFHxS)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluoroheptanesulfonic acid (PFHpS)[N15]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluorooctanesulfonic acid (PFOS)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluorodecanesulfonic acid (PFDS)[N15]	5	ug/kg	< 5	< 5	< 5	< 5
13C3-PFBS (surr.)	1	%	70	83	76	76
18O2-PFHxS (surr.)	1	%	77	89	93	79
13C8-PFOS (surr.)	1	%	67	78	83	83
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)						
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)[N11]	10	ug/kg	< 10	< 10	< 10	< 10
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
13C2-4:2 FTSA (surr.)	1	%	76	79	85	64
13C2-6:2 FTSA (surr.)	1	%	82	89	86	63
13C2-8:2 FTSA (surr.)	1	%	101	101	114	85
13C2-10:2 FTSA (surr.)	1	%	78	70	85	82
PFASs Summations						
Sum (PFHxS + PFOS)*	5	ug/kg	< 5	< 5	< 5	< 5
Sum of US EPA PFAS (PFOS + PFOA)*	5	ug/kg	< 5	< 5	< 5	< 5
Sum of enHealth PFAS (PFHxS + PFOS + PFOA)*	5	ug/kg	< 5	< 5	< 5	< 5
Sum of WA DWER PFAS (n=10)*	10	ug/kg	< 10	< 10	< 10	< 10
Sum of PFASs (n=30)*	50	ug/kg	< 50	< 50	< 50	< 50

Sample History

Where samples are submitted/analysed over several days, the last date of extraction is reported.

If the date and time of sampling are not provided, the Laboratory will not be responsible for compromised results should testing be performed outside the recommended holding time.

Description	Testing Site	Extracted	Holding Time
% Moisture	Melbourne	Dec 14, 2023	14 Days
- Method: LTM-GEN-7080 Moisture			
Per- and Polyfluoroalkyl Substances (PFASs)			
Perfluoroalkyl carboxylic acids (PFCAs)	Melbourne	Dec 15, 2023	28 Days
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			
Perfluoroalkyl sulfonamido substances	Melbourne	Dec 15, 2023	28 Days
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			
Perfluoroalkyl sulfonic acids (PFSAs)	Melbourne	Dec 15, 2023	28 Days
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)	Melbourne	Dec 15, 2023	28 Days
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			
PFASs Summations	Melbourne	Dec 14, 2023	
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			

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Project ID: WA_0089_PFASOMP_23

Order No.: 304700525/730
Report #: 1053798
Phone: [redacted]
Fax:

Received: Dec 13, 2023 4:30 PM
Due: Dec 20, 2023
Priority: 5 Day
Contact Name: [redacted]

Eurofins Analytical Services Manager : [redacted]

Sample Detail						Moisture Set	Per- and Polyfluoroalkyl Substances (PFASs)
Melbourne Laboratory - NATA # 1261 Site # 1254						X	X
External Laboratory							
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**		
1	0089_QC201_231211	Dec 11, 2023		Soil	L23-De0032392	X	X
2	0089_QC202_231211	Dec 11, 2023		Water	L23-De0032393		X
3	0089_QC203_231211	Dec 11, 2023		Water	L23-De0032394		X
4	0089_QC204_231211	Dec 11, 2023		Water	L23-De0032395		X
5	0089_QC205_231211	Dec 11, 2023		Soil	L23-De0032396	X	X
6	0089_QC206_231211	Dec 11, 2023		Water	L23-De0032397		X
7	0089_QC207_231211	Dec 11, 2023		Water	L23-De0032398		X
8	0089_QC208_231212	Dec 12, 2023		Water	L23-De0032399		X

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Eurofins Analytical Services Manager : [redacted]

Sample Detail						Moisture Set	Per- and Polyfluoroalkyl Substances (PFASs)
Melbourne Laboratory - NATA # 1261 Site # 1254						X	X
9	0089_QC209_231212	Dec 12, 2023		Water	L23-De0032400		X
10	0089_QC210_231213	Dec 12, 2023		Water	L23-De0032401		X
11	0089_QC211_231212	Dec 12, 2023		Soil	L23-De0032402	X	X
12	0089_QC212_231212	Dec 12, 2023		Water	L23-De0032403		X
13	0089_QC213_231212	Dec 12, 2023		Water	L23-De0032404		X
14	0089_QC214_231213	Dec 13, 2023		Water	L23-De0032405		X
15	0089_QC215_231213	Dec 13, 2023		Water	L23-De0032406		X
16	0089_QC216_231213	Dec 13, 2023		Soil	L23-De0032407	X	X
17	0089_QC217_231213	Dec 13, 2023		Water	L23-De0032408		X
18	0089_QC218_	Dec 13, 2023		Water	L23-De0032409		X

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Contact Name: [redacted]

Eurofins Analytical Services Manager : [redacted]

Sample Detail						Moisture Set	Per- and Polyfluoroalkyl Substances (PFASs)
Melbourne Laboratory - NATA # 1261 Site # 1254						X	X
18	0089_QC218_231213	Dec 13, 2023		Water	L23-De0032409		
Test Counts						4	18

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Internal Quality Control Review and Glossary

General

1. Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples follow guidelines delineated in the National Environment Protection (Assessment of Site Contamination) Measure 1999, as amended May 2013. They are included in this QC report where applicable. Additional QC data may be available on request.
2. All soil/sediment/solid results are reported on a dry weight basis unless otherwise stated.
3. All biota/food results are reported on a wet weight basis on the edible portion unless otherwise stated.
4. For CEC results where the sample's origin is unknown or environmentally contaminated, the results should be used advisedly.
5. Actual LORs are matrix dependent. Quoted LORs may be raised where sample extracts are diluted due to interferences.
6. Results are uncorrected for matrix spikes or surrogate recoveries except for PFAS compounds.
7. SVOC analysis on waters is performed on homogenised, unfiltered samples unless noted otherwise.
8. Samples were analysed on an 'as received' basis.
9. Information identified in this report with blue colour indicates data provided by customers that may have an impact on the results.
10. This report replaces any interim results previously issued.

Holding Times

Please refer to the 'Sample Preservation and Container Guide' for holding times (QS3001).

For samples received on the last day of holding time, notification of testing requirements should have been received at least 6 hours before sample receipt deadlines as stated on the SRA.

If the Laboratory did not receive the information in the required timeframe, and despite any other integrity issues, suitably qualified results may still be reported.

Holding times apply from the date of sampling; therefore, compliance with these may be outside the laboratory's control.

For VOCs containing vinyl chloride, styrene and 2-chloroethyl vinyl ether, the holding time is 7 days; however, for all other VOCs, such as BTEX or C6-10 TRH, the holding time is 14 days.

Units

mg/kg: milligrams per kilogram	**mg/L:** milligrams per litre	**ppm:** parts per million
µg/L: micrograms per litre	**ppb:** parts per billion	**%:** Percentage
org/100 mL: Organisms per 100 millilitres	**NTU:** Nephelometric Turbidity Units	**MPN/100 mL:** Most Probable Number of organisms per 100 millilitres
CFU: Colony forming unit	**Colour:** Pt-Co Units	

Terms

APHA	American Public Health Association
CEC	Cation Exchange Capacity
COC	Chain of Custody
CP	Client Parent - QC was performed on samples pertaining to this report
CRM	Certified Reference Material (ISO17034) - reported as percent recovery.
Dry	Where moisture has been determined on a solid sample, the result is expressed on a dry weight basis.
Duplicate	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
LOR	Limit of Reporting.
LCS	Laboratory Control Sample - reported as percent recovery.
Method Blank	In the case of solid samples, these are performed on laboratory-certified clean sands and in the case of water samples, these are performed on de-ionised water.
NCP	Non-Client Parent - QC performed on samples not pertaining to this report, QC represents the sequence or batch that client samples were analysed within.
RPD	Relative Percent Difference between two Duplicate pieces of analysis.
SPIKE	Addition of the analyte to the sample and reported as percentage recovery.
SRA	Sample Receipt Advice
Surr - Surrogate	The addition of a similar compound to the analyte target is reported as percentage recovery. See below for acceptance criteria.
TBTO	Tributyltin oxide (*bis*-tributyltin oxide) - individual tributyltin compounds cannot be identified separately in the environment; however, free tributyltin was measured, and its values were converted stoichiometrically into tributyltin oxide for comparison with regulatory limits.
TCLP	Toxicity Characteristic Leaching Procedure
TEQ	Toxic Equivalency Quotient or Total Equivalence
QSM	US Department of Defense Quality Systems Manual Version 5.4
US EPA	United States Environmental Protection Agency
WA DWER	Sum of PFBA, PFPeA, PFHxA, PFHpA, PFOA, PFBS, PFHxS, PFOS, 6:2 FTSA, 8:2 FTSA

QC - Acceptance Criteria

The acceptance criteria should only be used as a guide and may be different when site-specific Sampling Analysis and Quality Plan (SAQP) have been implemented.

RPD Duplicates: Global RPD Duplicates Acceptance Criteria is ≤30%; however, the following acceptance guidelines are equally applicable:

Results <10 times the LOR:	No Limit
Results between 10-20 times the LOR:	RPD must lie between 0-50%
Results >20 times the LOR:	RPD must lie between 0-30%

NOTE: pH duplicates are reported as a range, not as RPD

Surrogate Recoveries: Recoveries must lie between 20-130% for Speciated Phenols & 50-150% for PFAS. SVOCs recoveries 20 – 150%, VOC recoveries 70 – 130%

PFAS field samples containing surrogate recoveries above the QC limit designated in QSM 5.4, where no positive PFAS results have been reported or reviewed, and no data was affected.

QC Data General Comments

1. Where a result is reported as less than (<), higher than the nominated LOR, this is due to either matrix interference, extract dilution required due to interferences or contaminant levels within the sample, high moisture content or insufficient sample provided.
2. Duplicate data shown within this report that states the word "BATCH" is a Batch Duplicate from outside of your sample batch but within the laboratory sample batch at a 1:10 ratio. The Parent and Duplicate data shown are not data from your samples.
3. pH and Free Chlorine analysed in the laboratory - Analysis on this test must begin within 30 minutes of sampling. Therefore, laboratory analysis is unlikely to be completed within holding time.Analysis will begin as soon as possible after sample receipt.
4. Recovery Data (Spikes & Surrogates) - where chromatographic interference does not allow the determination of recovery, the term "INT" appears against that analyte.
5. For Matrix Spikes and LCS results, a dash "-" in the report means that the specific analyte was not added to the QC sample.
6. Duplicate RPDs are calculated from raw analytical data; thus, it is possible to have two sets of data.

Quality Control Results

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Method Blank							
Perfluoroalkyl carboxylic acids (PFCAs)							
Perfluorobutanoic acid (PFBA)	ug/kg	< 5			5	Pass	
Perfluoropentanoic acid (PFPeA)	ug/kg	< 5			5	Pass	
Perfluorohexanoic acid (PFHxA)	ug/kg	< 5			5	Pass	
Perfluoroheptanoic acid (PFHpA)	ug/kg	< 5			5	Pass	
Perfluorooctanoic acid (PFOA)	ug/kg	< 5			5	Pass	
Perfluorononanoic acid (PFNA)	ug/kg	< 5			5	Pass	
Perfluorodecanoic acid (PFDA)	ug/kg	< 5			5	Pass	
Perfluoroundecanoic acid (PFUnDA)	ug/kg	< 5			5	Pass	
Perfluorododecanoic acid (PFDoDA)	ug/kg	< 5			5	Pass	
Perfluorotridecanoic acid (PFTrDA)	ug/kg	< 5			5	Pass	
Perfluorotetradecanoic acid (PFTeDA)	ug/kg	< 5			5	Pass	
Method Blank							
Perfluoroalkyl sulfonamido substances							
Perfluorooctane sulfonamide (FOSA)	ug/kg	< 5			5	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	ug/kg	< 5			5	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	ug/kg	< 5			5	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)	ug/kg	< 5			5	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)	ug/kg	< 5			5	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	ug/kg	< 10			10	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	ug/kg	< 10			10	Pass	
Method Blank							
Perfluoroalkyl sulfonic acids (PFSAs)							
Perfluorobutanesulfonic acid (PFBS)	ug/kg	< 5			5	Pass	
Perfluorononanesulfonic acid (PFNS)	ug/kg	< 5			5	Pass	
Perfluoropropanesulfonic acid (PFPrS)	ug/kg	< 5			5	Pass	
Perfluoropentanesulfonic acid (PFPeS)	ug/kg	< 5			5	Pass	
Perfluorohexanesulfonic acid (PFHxS)	ug/kg	< 5			5	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	ug/kg	< 5			5	Pass	
Perfluorooctanesulfonic acid (PFOS)	ug/kg	< 5			5	Pass	
Perfluorodecanesulfonic acid (PFDS)	ug/kg	< 5			5	Pass	
Method Blank							
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)							
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	ug/kg	< 5			5	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)	ug/kg	< 10			10	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	ug/kg	< 5			5	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	ug/kg	< 5			5	Pass	
LCS - % Recovery							
Perfluoroalkyl carboxylic acids (PFCAs)							
Perfluorobutanoic acid (PFBA)	%	89			50-150	Pass	
Perfluoropentanoic acid (PFPeA)	%	98			50-150	Pass	
Perfluorohexanoic acid (PFHxA)	%	88			50-150	Pass	
Perfluoroheptanoic acid (PFHpA)	%	93			50-150	Pass	
Perfluorooctanoic acid (PFOA)	%	88			50-150	Pass	
Perfluorononanoic acid (PFNA)	%	96			50-150	Pass	
Perfluorodecanoic acid (PFDA)	%	93			50-150	Pass	
Perfluoroundecanoic acid (PFUnDA)	%	100			50-150	Pass	
Perfluorododecanoic acid (PFDoDA)	%	96			50-150	Pass	
Perfluorotridecanoic acid (PFTrDA)	%	88			50-150	Pass	
Perfluorotetradecanoic acid (PFTeDA)	%	112			50-150	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
LCS - % Recovery							
Perfluoroalkyl sulfonamido substances							
Perfluorooctane sulfonamide (FOSA)	%	72			50-150	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	%	96			50-150	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	%	69			50-150	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)	%	75			50-150	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)	%	84			50-150	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	%	73			50-150	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	%	100			50-150	Pass	
LCS - % Recovery							
Perfluoroalkyl sulfonic acids (PFSAs)							
Perfluorobutanesulfonic acid (PFBS)	%	71			50-150	Pass	
Perfluorononanesulfonic acid (PFNS)	%	94			50-150	Pass	
Perfluoropropanesulfonic acid (PFPrS)	%	63			50-150	Pass	
Perfluoropentanesulfonic acid (PFPeS)	%	84			50-150	Pass	
Perfluorohexanesulfonic acid (PFHxS)	%	84			50-150	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	%	78			50-150	Pass	
Perfluorooctanesulfonic acid (PFOS)	%	76			50-150	Pass	
Perfluorodecanesulfonic acid (PFDS)	%	86			50-150	Pass	
LCS - % Recovery							
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)							
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	%	81			50-150	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)	%	73			50-150	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	%	90			50-150	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	%	84			50-150	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Spike - % Recovery									
Perfluoroalkyl carboxylic acids (PFCAs)				Result 1					
Perfluorobutanoic acid (PFBA)	M23-De0034119	NCP	%	92			50-150	Pass	
Perfluoropentanoic acid (PFPeA)	M23-De0034119	NCP	%	103			50-150	Pass	
Perfluorohexanoic acid (PFHxA)	M23-De0034119	NCP	%	97			50-150	Pass	
Perfluoroheptanoic acid (PFHpA)	M23-De0034119	NCP	%	98			50-150	Pass	
Perfluorooctanoic acid (PFOA)	M23-De0034119	NCP	%	97			50-150	Pass	
Perfluorononanoic acid (PFNA)	M23-De0034119	NCP	%	105			50-150	Pass	
Perfluorodecanoic acid (PFDA)	M23-De0034119	NCP	%	101			50-150	Pass	
Perfluoroundecanoic acid (PFUnDA)	M23-De0034119	NCP	%	103			50-150	Pass	
Perfluorododecanoic acid (PFDoDA)	M23-De0034119	NCP	%	105			50-150	Pass	
Perfluorotridecanoic acid (PFTrDA)	M23-De0034119	NCP	%	101			50-150	Pass	
Perfluorotetradecanoic acid (PFTeDA)	M23-De0034119	NCP	%	105			50-150	Pass	
Spike - % Recovery									
Perfluoroalkyl sulfonamido substances				Result 1					
Perfluorooctane sulfonamide (FOSA)	M23-De0034119	NCP	%	77			50-150	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	M23-De0034119	NCP	%	105			50-150	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)	M23-De0034119	NCP	%	96			50-150	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)	M23-De0034119	NCP	%	91			50-150	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	M23-De0034119	NCP	%	105			50-150	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	M23-De0034119	NCP	%	99			50-150	Pass	
Spike - % Recovery									
Perfluoroalkyl sulfonic acids (PFSAs)				Result 1					
Perfluorobutanesulfonic acid (PFBS)	M23-De0034119	NCP	%	76			50-150	Pass	
Perfluorononanesulfonic acid (PFNS)	M23-De0034119	NCP	%	111			50-150	Pass	
Perfluoropropanesulfonic acid (PFPrS)	M23-De0034119	NCP	%	77			50-150	Pass	
Perfluoropentanesulfonic acid (PFPeS)	M23-De0034119	NCP	%	87			50-150	Pass	
Perfluorohexanesulfonic acid (PFHxS)	M23-De0034119	NCP	%	91			50-150	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	M23-De0034119	NCP	%	93			50-150	Pass	
Perfluorooctanesulfonic acid (PFOS)	M23-De0034119	NCP	%	103			50-150	Pass	
Perfluorodecanesulfonic acid (PFDS)	M23-De0034119	NCP	%	109			50-150	Pass	
Spike - % Recovery									
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)				Result 1					
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	M23-De0034119	NCP	%	104			50-150	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)	M23-De0034119	NCP	%	83			50-150	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	M23-De0034119	NCP	%	83			50-150	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	M23-De0034119	NCP	%	86			50-150	Pass	
Test	**Lab Sample ID**	**QA Source**	**Units**	**Result 1**			**Acceptance Limits**	**Pass Limits**	**Qualifying Code**
Duplicate									
Sample Properties				Result 1	Result 2	RPD			
% Moisture	R23-De0032827	NCP	%	9.2	8.5	8.1	30%	Pass	
Duplicate									
Perfluoroalkyl carboxylic acids (PFCAs)				Result 1	Result 2	RPD			
Perfluorobutanoic acid (PFBA)	M23-De0031280	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluoropentanoic acid (PFPeA)	M23-De0031280	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorohexanoic acid (PFHxA)	M23-De0031280	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluoroheptanoic acid (PFHpA)	M23-De0031280	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorooctanoic acid (PFOA)	M23-De0031280	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorononanoic acid (PFNA)	M23-De0031280	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorodecanoic acid (PFDA)	M23-De0031280	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluoroundecanoic acid (PFUnDA)	M23-De0031280	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorododecanoic acid (PFDoDA)	M23-De0031280	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorotridecanoic acid (PFTrDA)	M23-De0031280	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorotetradecanoic acid (PFTeDA)	M23-De0031280	NCP	ug/kg	< 5	< 5	<1	30%	Pass	

Duplicate									
Perfluoroalkyl sulfonamido substances				Result 1	Result 2	RPD			
Perfluorooctane sulfonamide (FOSA)	M23-De0031280	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	M23-De0031280	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	M23-De0031280	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)	M23-De0031280	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)	M23-De0031280	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	M23-De0031280	NCP	ug/kg	< 10	< 10	<1	30%	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	M23-De0031280	NCP	ug/kg	< 10	< 10	<1	30%	Pass	
Duplicate									
Perfluoroalkyl sulfonic acids (PFSAs)				Result 1	Result 2	RPD			
Perfluorobutanesulfonic acid (PFBS)	M23-De0031280	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorononanesulfonic acid (PFNS)	M23-De0031280	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluoropropanesulfonic acid (PFPrS)	M23-De0031280	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluoropentanesulfonic acid (PFPeS)	M23-De0031280	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorohexanesulfonic acid (PFHxS)	M23-De0031280	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	M23-De0031280	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorooctanesulfonic acid (PFOS)	M23-De0031280	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorodecanesulfonic acid (PFDS)	M23-De0031280	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
Duplicate									
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)				Result 1	Result 2	RPD			
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	M23-De0031280	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)	M23-De0031280	NCP	ug/kg	< 10	< 10	<1	30%	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	M23-De0031280	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	M23-De0031280	NCP	ug/kg	< 5	< 5	<1	30%	Pass	

Comments

Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	Yes
Sample correctly preserved	Yes
Appropriate sample containers have been used	Yes
Sample containers for volatile analysis received with minimal headspace	N/A
Samples received within HoldingTime	Yes
Some samples have been subcontracted	No

Qualifier Codes/Comments

Code	Description
N11	Isotope dilution is used for calibration of each native compound for which an exact labelled analogue is available (Isotope Dilution Quantitation). The isotopically labelled analogues allow identification and recovery correction of the concentration of the associated native PFAS compounds.
N15	Where the native PFAS compound does not have labelled analogue then the quantification is made using the Extracted Internal Standard Analyte with the closest retention time to the analyte and no recovery correction has been made (Internal Standard Quantitation).

Authorised by:

[redacted] Analytical Services Manager
[redacted] Senior Analyst-PFAS
[redacted] Senior Analyst-Sample Properties

[redacted]
[redacted]
General Manager

Final Report – this report replaces any previously issued Report

- Indicates Not Requested

* Indicates NATA accreditation does not cover the performance of this service

Measurement uncertainty of test data is available on request

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Stantec Australia Pty Limited
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NATA Accredited
Accreditation Number 2377
Site Number 2370

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Attention: [redacted]

Report **1053798-W**
Project name WA_0089_PFASOMP_23
Project ID WA_0089_PFASOMP_23
Received Date Dec 13, 2023

Client Sample ID			**0089_QC202_231211**	**0089_QC203_231211**	**0089_QC204_231211**	**0089_QC206_231211**
Sample Matrix			**Water**	**Water**	**Water**	**Water**
Eurofins Sample No.			**L23-De0032393**	**L23-De0032394**	**L23-De0032395**	**L23-De0032397**
Date Sampled			**Dec 11, 2023**	**Dec 11, 2023**	**Dec 11, 2023**	**Dec 11, 2023**
Test/Reference	LOR	Unit				
Perfluoroalkyl carboxylic acids (PFCAs)						
Perfluorobutanoic acid (PFBA)[N11]	0.05	ug/L	1.4	< 0.05	< 0.05	< 0.05
Perfluoropentanoic acid (PFPeA)[N11]	0.01	ug/L	4.7	< 0.01	0.02	< 0.01
Perfluorohexanoic acid (PFHxA)[N11]	0.01	ug/L	[N09]4.8	< 0.01	[N09]0.05	< 0.01
Perfluoroheptanoic acid (PFHpA)[N11]	0.01	ug/L	[N09]1.3	< 0.01	< 0.01	< 0.01
Perfluorooctanoic acid (PFOA)[N11]	0.01	ug/L	[N09]0.40	< 0.01	< 0.01	< 0.01
Perfluorononanoic acid (PFNA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorodecanoic acid (PFDA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluoroundecanoic acid (PFUnDA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorododecanoic acid (PFDoDA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorotridecanoic acid (PFTrDA)[N15]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorotetradecanoic acid (PFTeDA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
13C4-PFBA (surr.)	1	%	87	52	90	96
13C5-PFPeA (surr.)	1	%	95	100	114	117
13C5-PFHxA (surr.)	1	%	107	74	130	130
13C4-PFHpA (surr.)	1	%	111	71	132	128
13C8-PFOA (surr.)	1	%	94	118	116	109
13C5-PFNA (surr.)	1	%	129	88	114	120
13C6-PFDA (surr.)	1	%	111	80	73	101
13C2-PFUnDA (surr.)	1	%	65	69	34	47
13C2-PFDoDA (surr.)	1	%	48	96	24	37
13C2-PFTeDA (surr.)	1	%	12	104	18	13
Perfluoroalkyl sulfonamido substances						
Perfluorooctane sulfonamide (FOSA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
13C8-FOSA (surr.)	1	%	102	88	94	98
D3-N-MeFOSA (surr.)	1	%	29	15	56	41

Client Sample ID			0089_QC202_231211	0089_QC203_231211	0089_QC204_231211	0089_QC206_231211
Sample Matrix			Water	Water	Water	Water
Eurofins Sample No.			L23-De0032393	L23-De0032394	L23-De0032395	L23-De0032397
Date Sampled			Dec 11, 2023	Dec 11, 2023	Dec 11, 2023	Dec 11, 2023
Test/Reference	LOR	Unit				
Perfluoroalkyl sulfonamido substances						
D5-N-EtFOSA (surr.)	1	%	25	13	46	35
D7-N-MeFOSE (surr.)	1	%	38	24	33	43
D9-N-EtFOSE (surr.)	1	%	30	31	28	36
D5-N-EtFOSAA (surr.)	1	%	85	87	49	68
D3-N-MeFOSAA (surr.)	1	%	100	96	56	70
Perfluoroalkyl sulfonic acids (PFSAs)						
Perfluorobutanesulfonic acid (PFBS)[N11]	0.01	ug/L	0.29	< 0.01	< 0.01	< 0.01
Perfluorononanesulfonic acid (PFNS)[N15]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluoropropanesulfonic acid (PFPrS)[N15]	0.01	ug/L	0.13	< 0.01	< 0.01	< 0.01
Perfluoropentanesulfonic acid (PFPeS)[N15]	0.01	ug/L	0.35	< 0.01	< 0.01	< 0.01
Perfluorohexanesulfonic acid (PFHxS)[N11]	0.01	ug/L	[N09]0.75	< 0.01	< 0.01	< 0.01
Perfluoroheptanesulfonic acid (PFHpS)[N15]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorooctanesulfonic acid (PFOS)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	[N09]0.01
Perfluorodecanesulfonic acid (PFDS)[N15]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
13C3-PFBS (surr.)	1	%	82	101	133	132
18O2-PFHxS (surr.)	1	%	107	108	121	115
13C8-PFOS (surr.)	1	%	108	102	90	98
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)						
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)[N11]	0.05	ug/L	0.78	< 0.05	< 0.05	< 0.05
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
13C2-4:2 FTSA (surr.)	1	%	85	68	91	86
13C2-6:2 FTSA (surr.)	1	%	76	196	82	74
13C2-8:2 FTSA (surr.)	1	%	94	72	57	56
13C2-10:2 FTSA (surr.)	1	%	44	107	18	25
PFASs Summations						
Sum (PFHxS + PFOS)*	0.01	ug/L	0.75	< 0.01	< 0.01	0.01
Sum of US EPA PFAS (PFOS + PFOA)*	0.01	ug/L	0.4	< 0.01	< 0.01	0.01
Sum of enHealth PFAS (PFHxS + PFOS + PFOA)*	0.01	ug/L	1.15	< 0.01	< 0.01	0.01
Sum of WA DWER PFAS (n=10)*	0.05	ug/L	14.42	< 0.05	0.07	< 0.05
Sum of PFASs (n=30)*	0.1	ug/L	14.9	< 0.1	< 0.1	< 0.1

Client Sample ID			0089_QC207_231211	0089_QC208_231212	0089_QC209_231212	0089_QC210_231213
Sample Matrix			Water	Water	Water	Water
Eurofins Sample No.			L23-De0032398	L23-De0032399	L23-De0032400	L23-De0032401
Date Sampled			Dec 11, 2023	Dec 12, 2023	Dec 12, 2023	Dec 12, 2023
Test/Reference	LOR	Unit				
Perfluoroalkyl carboxylic acids (PFCAs)						
Perfluorobutanoic acid (PFBA)[N11]	0.05	ug/L	< 0.05	0.10	< 0.05	< 0.05
Perfluoropentanoic acid (PFPeA)[N11]	0.01	ug/L	< 0.01	0.22	< 0.01	< 0.01
Perfluorohexanoic acid (PFHxA)[N11]	0.01	ug/L	< 0.01	[N09]2.3	< 0.01	< 0.01
Perfluoroheptanoic acid (PFHpA)[N11]	0.01	ug/L	[N09]0.05	[N09]0.24	< 0.01	< 0.01
Perfluorooctanoic acid (PFOA)[N11]	0.01	ug/L	< 0.01	[N09]0.42	< 0.01	< 0.01

Client Sample ID			0089_QC207_231211	0089_QC208_231212	0089_QC209_231212	0089_QC210_231213
Sample Matrix			Water	Water	Water	Water
Eurofins Sample No.			L23-De0032398	L23-De0032399	L23-De0032400	L23-De0032401
Date Sampled			Dec 11, 2023	Dec 12, 2023	Dec 12, 2023	Dec 12, 2023
Test/Reference	LOR	Unit				
Perfluoroalkyl carboxylic acids (PFCAs)						
Perfluorononanoic acid (PFNA)[N11]	0.01	ug/L	< 0.01	0.01	< 0.01	< 0.01
Perfluorodecanoic acid (PFDA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluoroundecanoic acid (PFUnDA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorododecanoic acid (PFDoDA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorotridecanoic acid (PFTrDA)[N15]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorotetradecanoic acid (PFTeDA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
13C4-PFBA (surr.)	1	%	93	139	85	62
13C5-PFPeA (surr.)	1	%	115	104	120	129
13C5-PFHxA (surr.)	1	%	117	107	141	121
13C4-PFHpA (surr.)	1	%	127	110	127	119
13C8-PFOA (surr.)	1	%	116	66	114	161
13C5-PFNA (surr.)	1	%	117	112	128	109
13C6-PFDA (surr.)	1	%	95	43	111	85
13C2-PFUnDA (surr.)	1	%	50	62	62	93
13C2-PFDoDA (surr.)	1	%	35	49	44	91
13C2-PFTeDA (surr.)	1	%	17	18	11	66
Perfluoroalkyl sulfonamido substances						
Perfluorooctane sulfonamide (FOSA)[N11]	0.05	ug/L	< 0.05	0.09	< 0.05	< 0.05
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
13C8-FOSA (surr.)	1	%	95	113	99	113
D3-N-MeFOSA (surr.)	1	%	46	68	38	130
D5-N-EtFOSA (surr.)	1	%	40	66	35	107
D7-N-MeFOSE (surr.)	1	%	45	81	54	60
D9-N-EtFOSE (surr.)	1	%	41	72	47	64
D5-N-EtFOSAA (surr.)	1	%	67	87	82	97
D3-N-MeFOSAA (surr.)	1	%	73	93	87	107
Perfluoroalkyl sulfonic acids (PFSAs)						
Perfluorobutanesulfonic acid (PFBS)[N11]	0.01	ug/L	< 0.01	0.47	< 0.01	< 0.01
Perfluorononanesulfonic acid (PFNS)[N15]	0.01	ug/L	< 0.01	0.06	< 0.01	< 0.01
Perfluoropropanesulfonic acid (PFPrS)[N15]	0.01	ug/L	< 0.01	0.16	< 0.01	< 0.01
Perfluoropentanesulfonic acid (PFPeS)[N15]	0.01	ug/L	< 0.01	1.3	< 0.01	< 0.01
Perfluorohexanesulfonic acid (PFHxS)[N11]	0.01	ug/L	[N09]0.02	[N09]17	[N09]< 0.01	< 0.01
Perfluoroheptanesulfonic acid (PFHpS)[N15]	0.01	ug/L	< 0.01	[N09]0.94	< 0.01	< 0.01
Perfluorooctanesulfonic acid (PFOS)[N11]	0.01	ug/L	[N09]0.03	[N09]30	[N09]0.02	< 0.01
Perfluorodecanesulfonic acid (PFDS)[N15]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
13C3-PFBS (surr.)	1	%	136	92	134	93
18O2-PFHxS (surr.)	1	%	118	95	119	105
13C8-PFOS (surr.)	1	%	94	101	102	84

Client Sample ID			0089_QC207_231211	0089_QC208_231212	0089_QC209_231212	0089_QC210_231213
Sample Matrix			**Water**	**Water**	**Water**	**Water**
Eurofins Sample No.			**L23-De0032398**	**L23-De0032399**	**L23-De0032400**	**L23-De0032401**
Date Sampled			**Dec 11, 2023**	**Dec 12, 2023**	**Dec 12, 2023**	**Dec 12, 2023**
Test/Reference	LOR	Unit				
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)						
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
13C2-4:2 FTSA (surr.)	1	%	93	83	91	71
13C2-6:2 FTSA (surr.)	1	%	73	64	73	108
13C2-8:2 FTSA (surr.)	1	%	52	46	60	97
13C2-10:2 FTSA (surr.)	1	%	27	36	31	63
PFASs Summations						
Sum (PFHxS + PFOS)*	0.01	ug/L	0.05	47	0.02	< 0.01
Sum of US EPA PFAS (PFOS + PFOA)*	0.01	ug/L	0.03	30.42	0.02	< 0.01
Sum of enHealth PFAS (PFHxS + PFOS + PFOA)*	0.01	ug/L	0.05	47.42	0.02	< 0.01
Sum of WA DWER PFAS (n=10)*	0.05	ug/L	0.1	50.75	< 0.05	< 0.05
Sum of PFASs (n=30)*	0.1	ug/L	0.1	53.31	< 0.1	< 0.1

Client Sample ID			0089_QC212_231212	0089_QC213_231212	0089_QC214_231213	0089_QC215_231213
Sample Matrix			**Water**	**Water**	**Water**	**Water**
Eurofins Sample No.			**L23-De0032403**	**L23-De0032404**	**L23-De0032405**	**L23-De0032406**
Date Sampled			**Dec 12, 2023**	**Dec 12, 2023**	**Dec 13, 2023**	**Dec 13, 2023**
Test/Reference	LOR	Unit				
Perfluoroalkyl carboxylic acids (PFCAs)						
Perfluorobutanoic acid (PFBA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
Perfluoropentanoic acid (PFPeA)[N11]	0.01	ug/L	< 0.01	0.08	0.07	0.05
Perfluorohexanoic acid (PFHxA)[N11]	0.01	ug/L	0.04	[N09]0.31	[N09]0.04	[N09]0.04
Perfluoroheptanoic acid (PFHpA)[N11]	0.01	ug/L	< 0.01	0.14	< 0.01	< 0.01
Perfluorooctanoic acid (PFOA)[N11]	0.01	ug/L	[N09]0.09	[N09]0.88	< 0.01	< 0.01
Perfluorononanoic acid (PFNA)[N11]	0.01	ug/L	< 0.01	0.03	< 0.01	< 0.01
Perfluorodecanoic acid (PFDA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluoroundecanoic acid (PFUnDA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorododecanoic acid (PFDoDA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorotridecanoic acid (PFTrDA)[N15]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorotetradecanoic acid (PFTeDA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
13C4-PFBA (surr.)	1	%	83	73	76	127
13C5-PFPeA (surr.)	1	%	147	104	72	110
13C5-PFHxA (surr.)	1	%	138	68	62	121
13C4-PFHpA (surr.)	1	%	125	64	62	125
13C8-PFOA (surr.)	1	%	140	70	106	117
13C5-PFNA (surr.)	1	%	105	77	73	132
13C6-PFDA (surr.)	1	%	91	62	57	123
13C2-PFUnDA (surr.)	1	%	112	51	40	76
13C2-PFDoDA (surr.)	1	%	97	77	44	51
13C2-PFTeDA (surr.)	1	%	54	104	24	14

Client Sample ID			0089_QC212_231212	0089_QC213_231212	0089_QC214_231213	0089_QC215_231213
Sample Matrix			Water	Water	Water	Water
Eurofins Sample No.			L23-De0032403	L23-De0032404	L23-De0032405	L23-De0032406
Date Sampled			Dec 12, 2023	Dec 12, 2023	Dec 13, 2023	Dec 13, 2023
Test/Reference	LOR	Unit				
Perfluoroalkyl sulfonamido substances						
Perfluorooctane sulfonamide (FOSA)[N11]	0.05	ug/L	< 0.05	0.23	< 0.05	< 0.05
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
13C8-FOSA (surr.)	1	%	124	97	66	106
D3-N-MeFOSA (surr.)	1	%	187	33	12	42
D5-N-EtFOSA (surr.)	1	%	173	26	40	38
D7-N-MeFOSE (surr.)	1	%	71	49	15	66
D9-N-EtFOSE (surr.)	1	%	90	47	18	58
D5-N-EtFOSAA (surr.)	1	%	105	74	56	94
D3-N-MeFOSAA (surr.)	1	%	114	71	56	95
Perfluoroalkyl sulfonic acids (PFSAs)						
Perfluorobutanesulfonic acid (PFBS)[N11]	0.01	ug/L	[N09]0.01	0.04	< 0.01	< 0.01
Perfluorononanesulfonic acid (PFNS)[N15]	0.01	ug/L	< 0.01	< 0.05	< 0.01	< 0.01
Perfluoropropanesulfonic acid (PFPrS)[N15]	0.01	ug/L	< 0.01	0.01	< 0.01	< 0.01
Perfluoropentanesulfonic acid (PFPeS)[N15]	0.01	ug/L	[N09]0.06	0.06	< 0.01	< 0.01
Perfluorohexanesulfonic acid (PFHxS)[N11]	0.01	ug/L	[N09]1.5	[N09]2.9	[N09]0.05	[N09]0.05
Perfluoroheptanesulfonic acid (PFHpS)[N15]	0.01	ug/L	[N09]0.20	[N09]0.30	< 0.01	< 0.01
Perfluorooctanesulfonic acid (PFOS)[N11]	0.01	ug/L	[N09]0.51	[N09]16	[N09]0.07	[N09]0.06
Perfluorodecanesulfonic acid (PFDS)[N15]	0.01	ug/L	< 0.01	< 0.05	< 0.01	< 0.01
13C3-PFBS (surr.)	1	%	107	95	85	120
18O2-PFHxS (surr.)	1	%	56	122	90	123
13C8-PFOS (surr.)	1	%	75	90	68	108
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)						
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)[N11]	0.05	ug/L	< 0.05	0.10	< 0.05	< 0.05
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)[N11]	0.01	ug/L	< 0.01	0.01	< 0.01	< 0.01
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
13C2-4:2 FTSA (surr.)	1	%	116	99	65	79
13C2-6:2 FTSA (surr.)	1	%	91	169	160	65
13C2-8:2 FTSA (surr.)	1	%	103	59	55	70
13C2-10:2 FTSA (surr.)	1	%	69	89	50	40
PFASs Summations						
Sum (PFHxS + PFOS)*	0.01	ug/L	2.01	18.9	0.12	0.11
Sum of US EPA PFAS (PFOS + PFOA)*	0.01	ug/L	0.6	16.88	0.07	0.06
Sum of enHealth PFAS (PFHxS + PFOS + PFOA)*	0.01	ug/L	2.1	19.78	0.12	0.11
Sum of WA DWER PFAS (n=10)*	0.05	ug/L	2.15	20.46	0.23	0.2
Sum of PFASs (n=30)*	0.1	ug/L	2.41	21.09	0.23	0.2

Client Sample ID			0089_QC217_231213	0089_QC218_231213
Sample Matrix			**Water**	**Water**
Eurofins Sample No.			**L23-De0032408**	**L23-De0032409**
Date Sampled			**Dec 13, 2023**	**Dec 13, 2023**
Test/Reference	LOR	Unit		
Perfluoroalkyl carboxylic acids (PFCAs)				
Perfluorobutanoic acid (PFBA)[N11]	0.05	ug/L	< 0.05	1.5
Perfluoropentanoic acid (PFPeA)[N11]	0.01	ug/L	< 0.01	5.5
Perfluorohexanoic acid (PFHxA)[N11]	0.01	ug/L	< 0.01	[N09]4.8
Perfluoroheptanoic acid (PFHpA)[N11]	0.01	ug/L	< 0.01	[N09]0.74
Perfluorooctanoic acid (PFOA)[N11]	0.01	ug/L	< 0.01	[N09]0.29
Perfluorononanoic acid (PFNA)[N11]	0.01	ug/L	< 0.01	0.02
Perfluorodecanoic acid (PFDA)[N11]	0.01	ug/L	< 0.01	< 0.01
Perfluoroundecanoic acid (PFUnDA)[N11]	0.01	ug/L	< 0.01	< 0.01
Perfluorododecanoic acid (PFDoDA)[N11]	0.01	ug/L	< 0.01	< 0.01
Perfluorotridecanoic acid (PFTrDA)[N15]	0.01	ug/L	< 0.01	< 0.01
Perfluorotetradecanoic acid (PFTeDA)[N11]	0.01	ug/L	< 0.01	< 0.01
13C4-PFBA (surr.)	1	%	72	72
13C5-PFPeA (surr.)	1	%	87	111
13C5-PFHxA (surr.)	1	%	74	122
13C4-PFHpA (surr.)	1	%	67	121
13C8-PFOA (surr.)	1	%	131	114
13C5-PFNA (surr.)	1	%	85	143
13C6-PFDA (surr.)	1	%	69	120
13C2-PFUnDA (surr.)	1	%	53	58
13C2-PFDoDA (surr.)	1	%	69	93
13C2-PFTeDA (surr.)	1	%	72	62
Perfluoroalkyl sulfonamido substances				
Perfluorooctane sulfonamide (FOSA)[N11]	0.05	ug/L	< 0.05	< 0.05
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)[N11]	0.05	ug/L	< 0.05	< 0.05
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)[N11]	0.05	ug/L	< 0.05	< 0.05
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)[N11]	0.05	ug/L	< 0.05	< 0.05
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)[N11]	0.05	ug/L	< 0.05	< 0.05
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)[N11]	0.05	ug/L	< 0.05	< 0.05
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)[N11]	0.05	ug/L	< 0.05	< 0.05
13C8-FOSA (surr.)	1	%	29	134
D3-N-MeFOSA (surr.)	1	%	40	71
D5-N-EtFOSA (surr.)	1	%	31	71
D7-N-MeFOSE (surr.)	1	%	18	103
D9-N-EtFOSE (surr.)	1	%	14	92
D5-N-EtFOSAA (surr.)	1	%	69	153
D3-N-MeFOSAA (surr.)	1	%	70	140
Perfluoroalkyl sulfonic acids (PFSAs)				
Perfluorobutanesulfonic acid (PFBS)[N11]	0.01	ug/L	< 0.01	< 0.01
Perfluorononanesulfonic acid (PFNS)[N15]	0.01	ug/L	< 0.01	< 0.01
Perfluoropropanesulfonic acid (PFPrS)[N15]	0.01	ug/L	< 0.01	< 0.01
Perfluoropentanesulfonic acid (PFPeS)[N15]	0.01	ug/L	< 0.01	0.02
Perfluorohexanesulfonic acid (PFHxS)[N11]	0.01	ug/L	[N09]0.01	[N09]0.04
Perfluoroheptanesulfonic acid (PFHpS)[N15]	0.01	ug/L	< 0.01	< 0.01
Perfluorooctanesulfonic acid (PFOS)[N11]	0.01	ug/L	[N09]0.04	[N09]0.13
Perfluorodecanesulfonic acid (PFDS)[N15]	0.01	ug/L	< 0.01	< 0.01

Client Sample ID			0089_QC217_231213	0089_QC218_231213
Sample Matrix			Water	Water
Eurofins Sample No.			L23-De0032408	L23-De0032409
Date Sampled			Dec 13, 2023	Dec 13, 2023
Test/Reference	LOR	Unit		
Perfluoroalkyl sulfonic acids (PFSAs)				
13C3-PFBS (surr.)	1	%	92	88
18O2-PFHxS (surr.)	1	%	106	120
13C8-PFOS (surr.)	1	%	85	117
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)				
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)[N11]	0.01	ug/L	< 0.01	0.02
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)[N11]	0.05	ug/L	< 0.05	11
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)[N11]	0.01	ug/L	< 0.01	0.27
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)[N11]	0.01	ug/L	< 0.01	< 0.01
13C2-4:2 FTSA (surr.)	1	%	86	107
13C2-6:2 FTSA (surr.)	1	%	115	145
13C2-8:2 FTSA (surr.)	1	%	60	85
13C2-10:2 FTSA (surr.)	1	%	66	109
PFASs Summations				
Sum (PFHxS + PFOS)*	0.01	ug/L	0.05	0.17
Sum of US EPA PFAS (PFOS + PFOA)*	0.01	ug/L	0.04	0.42
Sum of enHealth PFAS (PFHxS + PFOS + PFOA)*	0.01	ug/L	0.05	0.46
Sum of WA DWER PFAS (n=10)*	0.05	ug/L	0.05	24.27
Sum of PFASs (n=30)*	0.1	ug/L	< 0.1	24.33

Sample History

Where samples are submitted/analysed over several days, the last date of extraction is reported.

If the date and time of sampling are not provided, the Laboratory will not be responsible for compromised results should testing be performed outside the recommended holding time.

Description	Testing Site	Extracted	Holding Time
Per- and Polyfluoroalkyl Substances (PFASs)			
Perfluoroalkyl carboxylic acids (PFCAs)	Melbourne	Dec 19, 2023	28 Days
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			
Perfluoroalkyl sulfonamido substances	Melbourne	Dec 19, 2023	28 Days
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			
Perfluoroalkyl sulfonic acids (PFSAs)	Melbourne	Dec 19, 2023	28 Days
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)	Melbourne	Dec 19, 2023	28 Days
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			
PFASs Summations	Melbourne	Dec 14, 2023	
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			

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Company Name: Stantec Australia Pty Ltd (WA)
Address: 6F 226,Adelaide Terrace
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WA 6000

Project Name: WA_0089_PFASOMP_23
Project ID: WA_0089_PFASOMP_23

Order No.: 304700525/730
Report #: 1053798
Phone: [redacted]
Fax:

Received: Dec 13, 2023 4:30 PM
Due: Dec 20, 2023
Priority: 5 Day
Contact Name: [redacted]

Eurofins Analytical Services Manager : [redacted]

Sample Detail						Moisture Set	Per- and Polyfluoroalkyl Substances (PFASs)
Melbourne Laboratory - NATA # 1261 Site # 1254						X	X
External Laboratory							
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**		
1	0089_QC201_231211	Dec 11, 2023		Soil	L23-De0032392	X	X
2	0089_QC202_231211	Dec 11, 2023		Water	L23-De0032393		X
3	0089_QC203_231211	Dec 11, 2023		Water	L23-De0032394		X
4	0089_QC204_231211	Dec 11, 2023		Water	L23-De0032395		X
5	0089_QC205_231211	Dec 11, 2023		Soil	L23-De0032396	X	X
6	0089_QC206_231211	Dec 11, 2023		Water	L23-De0032397		X
7	0089_QC207_231211	Dec 11, 2023		Water	L23-De0032398		X
8	0089_QC208_231212	Dec 12, 2023		Water	L23-De0032399		X

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Priority: 5 Day
Contact Name: [redacted]

Eurofins Analytical Services Manager : [redacted]

Sample Detail						Moisture Set	Per- and Polyfluoroalkyl Substances (PFASs)
Melbourne Laboratory - NATA # 1261 Site # 1254						X	X
9	0089_QC209_231212	Dec 12, 2023		Water	L23-De0032400		X
10	0089_QC210_231213	Dec 12, 2023		Water	L23-De0032401		X
11	0089_QC211_231212	Dec 12, 2023		Soil	L23-De0032402	X	X
12	0089_QC212_231212	Dec 12, 2023		Water	L23-De0032403		X
13	0089_QC213_231212	Dec 12, 2023		Water	L23-De0032404		X
14	0089_QC214_231213	Dec 13, 2023		Water	L23-De0032405		X
15	0089_QC215_231213	Dec 13, 2023		Water	L23-De0032406		X
16	0089_QC216_231213	Dec 13, 2023		Soil	L23-De0032407	X	X
17	0089_QC217_231213	Dec 13, 2023		Water	L23-De0032408		X
18	0089_QC218_	Dec 13, 2023		Water	L23-De0032409		X

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Eurofins Analytical Services Manager : [redacted]

Sample Detail						Moisture Set	Per- and Polyfluoroalkyl Substances (PFASs)
Melbourne Laboratory - NATA # 1261 Site # 1254						X	X
18	0089_QC218_231213	Dec 13, 2023		Water	L23-De0032409		
Test Counts						4	18

Internal Quality Control Review and Glossary

General

1. Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples follow guidelines delineated in the National Environment Protection (Assessment of Site Contamination) Measure 1999, as amended May 2013. They are included in this QC report where applicable. Additional QC data may be available on request.
2. All soil/sediment/solid results are reported on a dry weight basis unless otherwise stated.
3. All biota/food results are reported on a wet weight basis on the edible portion unless otherwise stated.
4. For CEC results where the sample's origin is unknown or environmentally contaminated, the results should be used advisedly.
5. Actual LORs are matrix dependent. Quoted LORs may be raised where sample extracts are diluted due to interferences.
6. Results are uncorrected for matrix spikes or surrogate recoveries except for PFAS compounds.
7. SVOC analysis on waters is performed on homogenised, unfiltered samples unless noted otherwise.
8. Samples were analysed on an 'as received' basis.
9. Information identified in this report with blue colour indicates data provided by customers that may have an impact on the results.
10. This report replaces any interim results previously issued.

Holding Times

Please refer to the 'Sample Preservation and Container Guide' for holding times (QS3001).

For samples received on the last day of holding time, notification of testing requirements should have been received at least 6 hours before sample receipt deadlines as stated on the SRA.

If the Laboratory did not receive the information in the required timeframe, and despite any other integrity issues, suitably qualified results may still be reported.

Holding times apply from the date of sampling; therefore, compliance with these may be outside the laboratory's control.

For VOCs containing vinyl chloride, styrene and 2-chloroethyl vinyl ether, the holding time is 7 days; however, for all other VOCs, such as BTEX or C6-10 TRH, the holding time is 14 days.

Units

mg/kg: milligrams per kilogram	**mg/L:** milligrams per litre	**ppm:** parts per million
µg/L: micrograms per litre	**ppb:** parts per billion	**%:** Percentage
org/100 mL: Organisms per 100 millilitres	**NTU:** Nephelometric Turbidity Units	**MPN/100 mL:** Most Probable Number of organisms per 100 millilitres
CFU: Colony forming unit	**Colour:** Pt-Co Units	

Terms

APHA	American Public Health Association
CEC	Cation Exchange Capacity
COC	Chain of Custody
CP	Client Parent - QC was performed on samples pertaining to this report
CRM	Certified Reference Material (ISO17034) - reported as percent recovery.
Dry	Where moisture has been determined on a solid sample, the result is expressed on a dry weight basis.
Duplicate	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
LOR	Limit of Reporting.
LCS	Laboratory Control Sample - reported as percent recovery.
Method Blank	In the case of solid samples, these are performed on laboratory-certified clean sands and in the case of water samples, these are performed on de-ionised water.
NCP	Non-Client Parent - QC performed on samples not pertaining to this report, QC represents the sequence or batch that client samples were analysed within.
RPD	Relative Percent Difference between two Duplicate pieces of analysis.
SPIKE	Addition of the analyte to the sample and reported as percentage recovery.
SRA	Sample Receipt Advice
Surr - Surrogate	The addition of a similar compound to the analyte target is reported as percentage recovery. See below for acceptance criteria.
TBTO	Tributyltin oxide (*bis*-tributyltin oxide) - individual tributyltin compounds cannot be identified separately in the environment; however, free tributyltin was measured, and its values were converted stoichiometrically into tributyltin oxide for comparison with regulatory limits.
TCLP	Toxicity Characteristic Leaching Procedure
TEQ	Toxic Equivalency Quotient or Total Equivalence
QSM	US Department of Defense Quality Systems Manual Version 5.4
US EPA	United States Environmental Protection Agency
WA DWER	Sum of PFBA, PFPeA, PFHxA, PFHpA, PFOA, PFBS, PFHxS, PFOS, 6:2 FTSA, 8:2 FTSA

QC - Acceptance Criteria

The acceptance criteria should only be used as a guide and may be different when site-specific Sampling Analysis and Quality Plan (SAQP) have been implemented.

RPD Duplicates: Global RPD Duplicates Acceptance Criteria is ≤30%; however, the following acceptance guidelines are equally applicable:

Results <10 times the LOR:	No Limit
Results between 10-20 times the LOR:	RPD must lie between 0-50%
Results >20 times the LOR:	RPD must lie between 0-30%

NOTE: pH duplicates are reported as a range, not as RPD

Surrogate Recoveries: Recoveries must lie between 20-130% for Speciated Phenols & 50-150% for PFAS. SVOCs recoveries 20 – 150%, VOC recoveries 70 – 130%

PFAS field samples containing surrogate recoveries above the QC limit designated in QSM 5.4, where no positive PFAS results have been reported or reviewed, and no data was affected.

QC Data General Comments

1. Where a result is reported as less than (<), higher than the nominated LOR, this is due to either matrix interference, extract dilution required due to interferences or contaminant levels within the sample, high moisture content or insufficient sample provided.
2. Duplicate data shown within this report that states the word "BATCH" is a Batch Duplicate from outside of your sample batch but within the laboratory sample batch at a 1:10 ratio. The Parent and Duplicate data shown are not data from your samples.
3. pH and Free Chlorine analysed in the laboratory - Analysis on this test must begin within 30 minutes of sampling. Therefore, laboratory analysis is unlikely to be completed within holding time.Analysis will begin as soon as possible after sample receipt.
4. Recovery Data (Spikes & Surrogates) - where chromatographic interference does not allow the determination of recovery, the term "INT" appears against that analyte.
5. For Matrix Spikes and LCS results, a dash "-" in the report means that the specific analyte was not added to the QC sample.
6. Duplicate RPDs are calculated from raw analytical data; thus, it is possible to have two sets of data.

Quality Control Results

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Method Blank							
Perfluoroalkyl carboxylic acids (PFCAs)							
Perfluorobutanoic acid (PFBA)	ug/L	< 0.05			0.05	Pass	
Perfluoropentanoic acid (PFPeA)	ug/L	< 0.01			0.01	Pass	
Perfluorohexanoic acid (PFHxA)	ug/L	< 0.01			0.01	Pass	
Perfluoroheptanoic acid (PFHpA)	ug/L	< 0.01			0.01	Pass	
Perfluorooctanoic acid (PFOA)	ug/L	< 0.01			0.01	Pass	
Perfluorononanoic acid (PFNA)	ug/L	< 0.01			0.01	Pass	
Perfluorodecanoic acid (PFDA)	ug/L	< 0.01			0.01	Pass	
Perfluoroundecanoic acid (PFUnDA)	ug/L	< 0.01			0.01	Pass	
Perfluorododecanoic acid (PFDoDA)	ug/L	< 0.01			0.01	Pass	
Perfluorotridecanoic acid (PFTrDA)	ug/L	< 0.01			0.01	Pass	
Perfluorotetradecanoic acid (PFTeDA)	ug/L	< 0.01			0.01	Pass	
Method Blank							
Perfluoroalkyl sulfonamido substances							
Perfluorooctane sulfonamide (FOSA)	ug/L	< 0.05			0.05	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	ug/L	< 0.05			0.05	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	ug/L	< 0.05			0.05	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)	ug/L	< 0.05			0.05	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)	ug/L	< 0.05			0.05	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	ug/L	< 0.05			0.05	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	ug/L	< 0.05			0.05	Pass	
Method Blank							
Perfluoroalkyl sulfonic acids (PFSAs)							
Perfluorobutanesulfonic acid (PFBS)	ug/L	< 0.01			0.01	Pass	
Perfluorononanesulfonic acid (PFNS)	ug/L	< 0.01			0.01	Pass	
Perfluoropropanesulfonic acid (PFPrS)	ug/L	< 0.01			0.01	Pass	
Perfluoropentanesulfonic acid (PFPeS)	ug/L	< 0.01			0.01	Pass	
Perfluorohexanesulfonic acid (PFHxS)	ug/L	< 0.01			0.01	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	ug/L	< 0.01			0.01	Pass	
Perfluorooctanesulfonic acid (PFOS)	ug/L	< 0.01			0.01	Pass	
Perfluorodecanesulfonic acid (PFDS)	ug/L	< 0.01			0.01	Pass	
Method Blank							
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)							
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	ug/L	< 0.01			0.01	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)	ug/L	< 0.05			0.05	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	ug/L	< 0.01			0.01	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	ug/L	< 0.01			0.01	Pass	
LCS - % Recovery							
Perfluoroalkyl carboxylic acids (PFCAs)							
Perfluorobutanoic acid (PFBA)	%	87			50-150	Pass	
Perfluoropentanoic acid (PFPeA)	%	88			50-150	Pass	
Perfluorohexanoic acid (PFHxA)	%	90			50-150	Pass	
Perfluoroheptanoic acid (PFHpA)	%	80			50-150	Pass	
Perfluorooctanoic acid (PFOA)	%	85			50-150	Pass	
Perfluorononanoic acid (PFNA)	%	92			50-150	Pass	
Perfluorodecanoic acid (PFDA)	%	89			50-150	Pass	
Perfluoroundecanoic acid (PFUnDA)	%	97			50-150	Pass	
Perfluorododecanoic acid (PFDoDA)	%	100			50-150	Pass	
Perfluorotridecanoic acid (PFTrDA)	%	87			50-150	Pass	
Perfluorotetradecanoic acid (PFTeDA)	%	96			50-150	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
LCS - % Recovery							
Perfluoroalkyl sulfonamido substances							
Perfluorooctane sulfonamide (FOSA)	%	87			50-150	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	%	89			50-150	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	%	89			50-150	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)	%	116			50-150	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)	%	97			50-150	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	%	85			50-150	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	%	89			50-150	Pass	
LCS - % Recovery							
Perfluoroalkyl sulfonic acids (PFSAs)							
Perfluorobutanesulfonic acid (PFBS)	%	76			50-150	Pass	
Perfluorononanesulfonic acid (PFNS)	%	80			50-150	Pass	
Perfluoropropanesulfonic acid (PFPrS)	%	98			50-150	Pass	
Perfluoropentanesulfonic acid (PFPeS)	%	86			50-150	Pass	
Perfluorohexanesulfonic acid (PFHxS)	%	78			50-150	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	%	108			50-150	Pass	
Perfluorooctanesulfonic acid (PFOS)	%	87			50-150	Pass	
Perfluorodecanesulfonic acid (PFDS)	%	72			50-150	Pass	
LCS - % Recovery							
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)							
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	%	88			50-150	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)	%	76			50-150	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	%	85			50-150	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	%	85			50-150	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Spike - % Recovery									
Perfluoroalkyl carboxylic acids (PFCAs)				Result 1					
Perfluorobutanoic acid (PFBA)	M23-De0031191	NCP	%	76			50-150	Pass	
Perfluoropentanoic acid (PFPeA)	M23-De0031191	NCP	%	71			50-150	Pass	
Perfluorohexanoic acid (PFHxA)	M23-De0031191	NCP	%	111			50-150	Pass	
Spike - % Recovery									
Perfluoroalkyl sulfonic acids (PFSAs)				Result 1					
Perfluorohexanesulfonic acid (PFHxS)	M23-De0031191	NCP	%	100			50-150	Pass	
Perfluorooctanesulfonic acid (PFOS)	M23-De0031191	NCP	%	89			50-150	Pass	
Spike - % Recovery									
Perfluoroalkyl carboxylic acids (PFCAs)				Result 1					
Perfluoroheptanoic acid (PFHpA)	L23-De0032406	CP	%	99			50-150	Pass	
Perfluorooctanoic acid (PFOA)	L23-De0032406	CP	%	90			50-150	Pass	
Perfluorononanoic acid (PFNA)	L23-De0032406	CP	%	100			50-150	Pass	
Perfluorodecanoic acid (PFDA)	L23-De0032406	CP	%	89			50-150	Pass	
Perfluoroundecanoic acid (PFUnDA)	L23-De0032406	CP	%	114			50-150	Pass	
Perfluorododecanoic acid (PFDoDA)	L23-De0032406	CP	%	98			50-150	Pass	
Perfluorotridecanoic acid (PFTrDA)	L23-De0032406	CP	%	57			50-150	Pass	
Perfluorotetradecanoic acid (PFTeDA)	L23-De0032406	CP	%	76			50-150	Pass	
Spike - % Recovery									
Perfluoroalkyl sulfonamido substances				Result 1					
Perfluorooctane sulfonamide (FOSA)	L23-De0032406	CP	%	88			50-150	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	L23-De0032406	CP	%	87			50-150	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	L23-De0032406	CP	%	89			50-150	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)	L23-De0032406	CP	%	96			50-150	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)	L23-De0032406	CP	%	91			50-150	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	L23-De0032406	CP	%	79			50-150	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	L23-De0032406	CP	%	84			50-150	Pass	
Spike - % Recovery									
Perfluoroalkyl sulfonic acids (PFSAs)				Result 1					
Perfluorobutanesulfonic acid (PFBS)	L23-De0032406	CP	%	57			50-150	Pass	
Perfluorononanesulfonic acid (PFNS)	L23-De0032406	CP	%	69			50-150	Pass	
Perfluoropropanesulfonic acid (PFPrS)	L23-De0032406	CP	%	71			50-150	Pass	
Perfluoropentanesulfonic acid (PFPeS)	L23-De0032406	CP	%	81			50-150	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	L23-De0032406	CP	%	105			50-150	Pass	
Perfluorodecanesulfonic acid (PFDS)	L23-De0032406	CP	%	85			50-150	Pass	
Spike - % Recovery									
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)				Result 1					
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	L23-De0032406	CP	%	90			50-150	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)	L23-De0032406	CP	%	111			50-150	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	L23-De0032406	CP	%	96			50-150	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	L23-De0032406	CP	%	80			50-150	Pass	
Test	**Lab Sample ID**	**QA Source**	**Units**	**Result 1**			**Acceptance Limits**	**Pass Limits**	**Qualifying Code**
Duplicate									
Perfluoroalkyl carboxylic acids (PFCAs)				Result 1	Result 2	RPD			
Perfluorobutanoic acid (PFBA)	L23-De0032403	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
Perfluoropentanoic acid (PFPeA)	L23-De0032403	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorohexanoic acid (PFHxA)	L23-De0032403	CP	ug/L	0.04	0.05	1.3	30%	Pass	
Perfluoroheptanoic acid (PFHpA)	L23-De0032403	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorooctanoic acid (PFOA)	L23-De0032403	CP	ug/L	0.09	0.08	8.2	30%	Pass	
Perfluorononanoic acid (PFNA)	L23-De0032403	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorodecanoic acid (PFDA)	L23-De0032403	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluoroundecanoic acid (PFUnDA)	L23-De0032403	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorododecanoic acid (PFDoDA)	L23-De0032403	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorotridecanoic acid (PFTrDA)	L23-De0032403	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorotetradecanoic acid (PFTeDA)	L23-De0032403	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	

Duplicate									
Perfluoroalkyl sulfonamido substances				Result 1	Result 2	RPD			
Perfluorooctane sulfonamide (FOSA)	L23-De0032403	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	L23-De0032403	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	L23-De0032403	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)	L23-De0032403	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)	L23-De0032403	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	L23-De0032403	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	L23-De0032403	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
Duplicate									
Perfluoroalkyl sulfonic acids (PFSAs)				Result 1	Result 2	RPD			
Perfluorobutanesulfonic acid (PFBS)	L23-De0032403	CP	ug/L	0.01	0.02	<1	30%	Pass	
Perfluorononanesulfonic acid (PFNS)	L23-De0032403	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluoropropanesulfonic acid (PFPrS)	L23-De0032403	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluoropentanesulfonic acid (PFPeS)	L23-De0032403	CP	ug/L	0.06	0.06	1.6	30%	Pass	
Perfluorohexanesulfonic acid (PFHxS)	L23-De0032403	CP	ug/L	1.5	1.5	<1	30%	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	L23-De0032403	CP	ug/L	0.20	0.21	6.0	30%	Pass	
Perfluorooctanesulfonic acid (PFOS)	L23-De0032403	CP	ug/L	0.51	0.53	3.8	30%	Pass	
Perfluorodecanesulfonic acid (PFDS)	L23-De0032403	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Duplicate									
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)				Result 1	Result 2	RPD			
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	L23-De0032403	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)	L23-De0032403	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	L23-De0032403	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	L23-De0032403	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	

Comments

Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	Yes
Sample correctly preserved	Yes
Appropriate sample containers have been used	Yes
Sample containers for volatile analysis received with minimal headspace	N/A
Samples received within HoldingTime	Yes
Some samples have been subcontracted	No

Qualifier Codes/Comments

Code	Description
N09	Quantification of linear and branched isomers has been conducted as a single total response using the relative response factor for the corresponding linear/branched standard.
N11	Isotope dilution is used for calibration of each native compound for which an exact labelled analogue is available (Isotope Dilution Quantitation). The isotopically labelled analogues allow identification and recovery correction of the concentration of the associated native PFAS compounds.
N15	Where the native PFAS compound does not have labelled analogue then the quantification is made using the Extracted Internal Standard Analyte with the closest retention time to the analyte and no recovery correction has been made (Internal Standard Quantitation).

Authorised by:

[redacted] Analytical Services Manager
[redacted] Senior Analyst-PFAS
[redacted] Senior Analyst-PFAS

[redacted]

General Manager

Final Report – this report replaces any previously issued Report

- Indicates Not Requested

* Indicates NATA accreditation does not cover the performance of this service

Measurement uncertainty of test data is available on request

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APPENDIX

D

FIELD RECORDS & CALIBRATION CERTIFICATES

Cardno

now

Stantec

Monitoring Date	Monitoring Location	Sample_ID	Screen Interval (mbTOC)	TOC (mAHD)	Well Depth (m)	SWL (mbTOC)	RWL (mAHD)	Observations	Sampling Method	R1 - Temp (°C)	R1 - DO (mg/L)	R1 - EC (us/Cm)	R1 - TDS (mg/L)	R1 - pH	R1 - Eh (mV)
12/12/2023	MW109	0089_MW109_231212	2.5-5.5_	4.446	5.5	4.33	0.116		HydraSleeve	22.5	2.25	865	562	7.04	-57.3
12/12/2023	MW112	0089_MW112_231212	3.0 - 6.0	3.973	6.0	3.66	0.313		HydraSleeve	24.1	1.05	527	342.2	7.39	-69.6
12/12/2023	MW120	0089_MW120_231212	2.5-5.5_	4.409	5.5	4.28	0.129		HydraSleeve	21.9	2.47	695	4518	7.38	-62.8
12/12/2023	MW121	0089_MW121_231212	2.7-5.7_	3.7	5.7	3.54	0.16		HydraSleeve	22.4	7.04	511	332	7.67	-55.5
12/12/2023	MW123	0089_MW123_231212	4.5-8_	6.62	8.0	6.5	0.12		HydraSleeve	26.2	2.64	699	454.6	7.4	-59.8
11/12/2023	MW124	0089_MW124_231211	0.75-4_	1.899	4.0	1.82	0.079		HydraSleeve	22.1	0.77	42500	27624	7.23	-214.4
11/12/2023	MW125	0089_MW125_231211	0.9-3.9_	1.882	3.9	1.83	0.052		HydraSleeve	23.5	0.31	42759	27795	7.12	-234
11/12/2023	MW126	0089_MW126_231211	0.9-3.9_	1.948	3.9	1.92	0.028		HydraSleeve	23.6	0.35	42780	27802	7.15	-280
11/12/2023	MW127	0089_MW127_231211	0.9-3.9_	1.771	3.9	1.72	0.051		HydraSleeve	23.6	1.05	43759	28525	7.62	-252.6
12/12/2023	MW128	0089_MW128_231212	2.5-5.5_	4.537	5.5	4.52	0.017		HydraSleeve	24.4	2.88	1288	837	7.12	-70.2
19/12/2023	MW139	0089_MW139_231219	2-5_	2.273	5.0	2.21	0.063		HydraSleeve	26.2	1.27	3794	2466	7.4	-90.7
19/12/2023	MW141	0089_MW141_231219	2-5_	3.025	5.0	2.995	0.03		HydraSleeve	22.4	3.06	27346	17772	6.83	-94.4
19/12/2023	MW142	0089_MW142_231219	0.25-4_	2.573	4.0	2.595	-0.022		HydraSleeve	20.6	1.47	32843	21350	7.04	-98.4
19/12/2023	MW147	0089_MW147_231219	2-5_	3.423	4.3	3.35	0.073	Bore depth shallower than records. Potential sand ingress or roots. Shallow water, bailer used after purge	HandBailing	20.1	2.33	29852	19407	7.26	-269
19/12/2023	MW149	0089_MW149_231219	1-4_	2.303	4.0	2.31	-0.007		HydraSleeve	21.1	1.67	24598	15990	7.3	-151.1
12/12/2023	MW158	0089_MW158_231212	NA	14.541	15.82	14.4	0.141		HydraSleeve	22.8	4.57	7780	5057	7.43	-81.5
12/12/2023	MW161		NA	17.225	18.13			Unable to sample well dry or blocked. No water in hydrasleeve and bailer wouldn't fill up							
12/12/2023	MW166	0089_MW166_231212	10-13_	11.89	13.0	11.53	0.36		HydraSleeve	24.7	2.62	4283	2784	7.2	-73.5
12/12/2023	MW171	0089_MW171_231212	28.5-31.5_	29.238	31.5	28.5	0.738		HydraSleeve	23.7	3.01	13052	8484	7.32	-64.9
13/12/2023	MW173	0089_MW173_231213	NA	10.08	11.11	9.815	0.265		HydraSleeve	22.5	2.56	3312	2152	7.24	-41
13/12/2023	MW193	0089_MW193_231213	10.5-13.5_	11.86	13.5	11.48	0.38		HydraSleeve	21.6	2.74	2749	1787	7.18	-21.5
13/12/2023	MW195D	0089_MW195D_231213	10-13_	4.363	13.0	4.17	0.193		HydraSleeve	22	1.95	14835	9642	7.43	-68.4
13/12/2023	MW195S		3.5-6.5_	4.571	6.5			Dry							
13/12/2023	MW196		NA	12.75	13.8			Dry							
13/12/2023	MW197		NA	2.28	NA			Dry/silted up not sampled							
12/12/2023	MW199	0089_MW199_231212	NA	11.8	NA	11.5	0.3		HydraSleeve	24.7	0.26	17255	11210	7.18	-259.4
13/12/2023	MW200	0089_MW200_231213	NA	2.07	NA	2.2	-0.13		HandBailing	22.3	2.15	4646	3020	7.64	-195.7
13/12/2023	MW202	0089_MW202_231213	NA	2.12		1.999	0.121		HydraSleeve	22.9	1.22	1982	1288	7.55	-97.9
12/12/2023	MW203	0089_MW203_231212	NA	10.855	12.9	10.69	0.165		HydraSleeve	23.6	3.71	1259	819	7.4	-54.9
11/12/2023	MW214		5.5-9.0_	8.075	9.0			Dry							
11/12/2023	MW215	0089_MW215_231211	1.5-4.5_	3.794	4.5	3.89	-0.096		HydraSleeve	24.4	3.79	3062	1993	7.79	-78.2
11/12/2023	MW216	0089_MW216_231211	6-9_	8.329	6.0	8.18	0.149		HydraSleeve	22	4.85	1369	890	7.51	-64.6
13/12/2023	MW217	0089_MW217_231213	6.5-9.5_	8.847	9.5	8.6	0.247		HydraSleeve	23.3	7.17	823	535	7.53	-32.3
13/12/2023	MW220	0089_MW220_231213	NA	NA	NA	6.84			HydraSleeve	21.5	3.38	814	529	7.32	-57.9
13/12/2023	MW224	0089_MW224_231213	11.25-14.25_	13.372	14.25	13.12	0.252		HydraSleeve	23.1	7.72	515	334.4	7.73	-50.8
11/12/2023	MW225	0089_MW225_231211	2.0-5.0_	4.066	5	4.12	-0.054		HydraSleeve	21.3	4.63	3345	2171	7.75	-122.5
11/12/2023	MW226	0089_MW226_231211	0.75-3.8_	1.749	3.8	1.91	-0.161		HydraSleeve	24.3	0.9	43276	28139	7.11	-93.2
11/12/2023	MW227	0089_MW227_231211	1.25-4.20_	2.961	4.2	3.09	-0.29		HydraSleeve	22.6	2.85	5355	3481	7.57	-71.5
11/12/2023	MW228	0089_MW228_231211	0.75-3.75_	2.23	3.75	2.835	-0.605		HydraSleeve	24.9	1.7	9601	6245	7.39	-82.1
13/12/2023	MW233	0089_MW233_231213	NA	3.705		3.46	0.245		HydraSleeve	24.8	0.97	1612	1048	8	-152.9
13/12/2023	MW236	0089_MW236_231213	NA	4.642	5.66	4.28	0.362		HydraSleeve	21.3	5.61	674	438.3	7.48	-46.6
12/12/2023	MW238	0089_MW238_231212	NA	4.827		4.25	0.577		HydraSleeve	22.3	1.66	696	452	7.55	-93.5
12/12/2023	MW239	0089_MW239_231212	NA	4.03		3.75	0.28	Insufficient sample for green bottle / field parameters	HydraSleeve						
12/12/2023	MW240	0089_MW240_231212	NA	4.483	6.8	4.2	0.283		HydraSleeve	23.3	1.66	812	527	7.55	-83.6
13/12/2023	MW242	0089_MW242_231213	NA	3.539		3.3	0.239		HydraSleeve	24.5	2.28	468.8	304.7	7.73	-105
12/12/2023	MW243	0089_MW243_231212	NA	4.892	7.0	4.64	0.252		HydraSleeve	22.8	3.22	995	647	7.58	-24.7
12/12/2023	MW245	0089_MW245_231212	NA	4.551	5.65	4.32	0.231		HydraSleeve	20.6	4.09	766	498	7.23	-99.2
12/12/2023	MW249	0089_MW249_231212	3.5-6.5_	5.227	6.5	5.09	0.137		HydraSleeve	23.6	4	1290	839	7.33	-100.5
13/12/2023	MW255	0089_MW255_231213	3.0-6.0_	4.609	6.0	4.31	0.299		HydraSleeve	21.7	2.02	736	478.2	7.53	-98.7
13/12/2023	MW256	0089_MW256_231213	3.0-6.0_	3.84	6	3.5	0.34		HydraSleeve	20.3	2.02	1207	785	7.1	-88.2
13/12/2023	MW257	0089_MW257_231213	2.7-5.7_	3.806	5.7	3.542	0.264		HydraSleeve	21.3	4.32	518	336.6	7.72	-72.6
13/12/2023	MW258	0089_MW258_231213	3.0-6.0_	4.043	6	3.76	0.283		HydraSleeve	21.5	2.25	1307	849	7.05	-81.3
13/12/2023	MW259	0089_MW259_231213	2.5-5.5_	3.8	5.5	3.54	0.26		HydraSleeve	19.7	1.68	630	409.6	7.22	-85.7
12/12/2023	MW268	0089_MW268_231212	2.5-5.5_	4.056	5.5	4.11	-0.054		HydraSleeve	26.2	4.6	1442	937	7.41	-101.6
12/12/2023	MW269	0089_MW269_231212	2.5-5.5_	4.153	5.5	4.28	-0.127		HydraSleeve	26.3	3.69	1427	928	7.41	-100
13/12/2023	MW282	0089_MW282_231213	4.5-7.5_	5.78	7.5	5.52	0.26		HydraSleeve	23.3	4.91	1133	736	7.09	-50.9
13/12/2023	MW288	0089_MW288_231213	2.25-5.25_	4.003	5.25	3.98	0.023		HydraSleeve	24.8	0.8	887	576	7.13	-81.1
11/12/2023	MW289	0089_MW289_231211	3.25-6.25_	4.495	6.25	4.28	0.215		HydraSleeve	21.5	3.7	1037	675	7.38	-31.2
12/12/2023	MW496	0089_MW496_231212	3.5-8_	5.092	8.0	5.05	0.042		HydraSleeve	23	0.6	1499	975	7.53	-239.1
12/12/2023	MW500	0089_MW500_231212	2-6.5_	3.692	6.5	3.55	0.142		HydraSleeve	24.1	2.01	1226	798	7.18	-54.6
12/12/2023	MW516	0089_MW516_231212	4.5-7.5_	6.37	7.5	6.3	0.07		HydraSleeve	25.2	1.15	505	978	7.51	203

Monitoring Location	R2 - Temp (oC)	R2 - DO (mg/L)	R2 - EC (us/Cm)	R2 - TDS (mg/L)	R2 - pH	R2 - Eh (mV)	R3 - Temp (oC)	R3 - DO (mg/L)	R3 - EC (us/Cm)	R3 - TDS (mg/L)	R3 - pH	R3 - Eh (mV)	QC Dup Sample #	Odour Comments	Colour
MW109															Cloudy
MW112													QC113/213		Clear
MW120													QC112/212		Cloudy
MW121															Cloudy
MW123													QC108/208		Cloudy
MW124															Clear
MW125															Clear
MW126															Clear
MW127															Clear
MW128															Brown
MW139															Clear
MW141															Clear
MW142															Clear
MW147	20.6	1.73	27122	17630	7.24	-249.7	20.6	1.7	27131	17635	7.24	-248.8			Clear
MW149															Clear
MW158															Clear
MW161															Clear
MW166															Clear
MW171															Clear
MW173															Clear
MW193															Cloudy
MW195D															Clear
MW195S															Clear
MW196															Clear
MW197															Clear
MW199														Hydrogen sulfide	Brown
MW200	22.3	2	4641	3016	7.63	-193.4	22.3	1.88	4636	3013	7.63	-190			Clear
MW202													QC117/217		Clear
MW203															Clear
MW214															Clear
MW215															Clear
MW216															Cloudy
MW217													QC118/218		Cloudy
MW220														Hydrogen sulfide	Cloudy
MW224															Cloudy
MW225															Clear
MW226															Clear
MW227															Clear
MW228													QC102/202		Clear
MW233															Clear
MW236															Clear
MW238															Clear
MW239															Clear
MW240															Clear
MW242															Clear
MW243															Cloudy
MW245															Clear
MW249															Clear
MW255															Clear
MW256															Cloudy
MW257															Cloudy
MW258															Cloudy
MW259													QC114/QC214		Clear
MW268															Clear
MW269															Clear
MW282															Cloudy
MW288															Clear
MW289															Clear
MW496															Clear
MW500															Cloudy
MW516															Clear

Monitoring Date	Monitoring Location	Sample_ID	Sample depth (mBGL)	Sampling Method	R1 - Temp (°C)	R1 - DO (mg/L)	R1 - EC (us/Cm)	R1 - TDS (mg/L)	R1 - pH	R1 - Eh (mV)	R2 - Temp (oC)	R2 - DO (mg/L)	R2 - EC (us/Cm)
13/12/2023	PW304	0089_PW304_231213	0.5	Peristaltic Pump	27	1.05	18232	11852	7.78	-222.5	27.1	1.06	18242
11/12/2023	PW306	0089_PW306_231211	0.5	Peristaltic Pump	25.8	0.55	55264	35814	7.04	-337.5	26.4	0.26	55131
11/12/2023	PW307	0089_PW307_231211	0.4	Peristaltic Pump	22.8	4.56	55749	36266	7.68	-139.4	23	4.19	55878
11/12/2023	PW308	0089_PW308_231211	0.4	Peristaltic Pump	24	4.45	56259	36578	7.83	-55.4			
11/12/2023	PW314	0089_PW314_231211	0.5	Peristaltic Pump	24.4	6.06	55468	36070	7.69	-76.8	25	5.15	55617
11/12/2023	PW315	0089_PW315_231211	0.4	Peristaltic Pump	27.1	2.73	55991	36442	7.67	-71.7	27.4	2.58	55920
11/12/2023	PW316	0089_PW316_231211	0.3	Peristaltic Pump	23.5	5.57	52056	33839	7.67	-84	24	4.47	52114
19/12/2023	PW329	0089_PW329_231219	0.3	Peristaltic Pump	22.4	1.65	56196	36525	7.65	-212.3			
19/12/2023	PW330	0089_PW330_231219	0.35	Peristaltic Pump	22.1	2.32	56600	36801	7.76	-186.4			
19/12/2023	PW331	0089_PW331_231219	0.25	Peristaltic Pump	22.9	0.87	61451	39934	7.36	-245			
14/12/2023	PW335	0089_PW335_231214	0.5	Peristaltic Pump	22	0.72	57443	37341	7.66	-208.5	22.1	0.73	57445
11/12/2023	PW340	0089_PW340_231211	0.5	Peristaltic Pump	24.9	0.95	58705	38162	7.51	-212.3	25	0.96	58709
11/12/2023	PW341	0089_PW341_231211	0.5	Peristaltic Pump	24.9	0.98	58709	38164	7.52	-213.2	24.9	0.99	58712
13/12/2023	PW345	0089_PW345_231213	0.5	Peristaltic Pump	22.7	1.41	63008	40962	7.05	-296.3	22.7	1.36	63041
13/12/2023	PW346	0089_PW346_231213	0.5	Peristaltic Pump	26.4	0.9	7064	4591	7.96	-231.9	26.5	0.88	7051
14/12/2023	PW350	0089_PW350_231214	0.5	Peristaltic Pump	22.7	3.72	28940	18811	7.87	-59.2			
14/12/2023	PW351	0089_PW351_231214	0.5	Peristaltic Pump	23.7	2.71	54685	35545	7.89	-66.2			
14/12/2023	PW352	0089_PW352_231214	0.5	Peristaltic Pump	22.6	1.16	54565	35467	7.87	-70.3			
19/12/2023	PW356	0089_PW356_231219	0.35	Peristaltic Pump	24.2	0.93	63906	41537	7.51	-244.1			
19/12/2023	PW357	0089_PW357_231219	0.4	Peristaltic Pump	22.6	1.07	59463	38654	7.56	-193.9			
19/12/2023	PW358	0089_PW358_231219	0.4	Peristaltic Pump	23.1	2.19	58657	38132	7.6	-246.1			
11/12/2023	PW362	0089_PW362_231211	0.5	Peristaltic Pump	23.5	1.45	58822	38240	7.7	-155.8	23.5	1.46	58824
11/12/2023	PW363	0089_PW363_231211	0.5	Peristaltic Pump	25.9	3.51	59559	38747	7.79	-117.5	25.1	3.52	59610
11/12/2023	PW364	0089_PW364_231211	0.5	Peristaltic Pump	23.6	0.83	57842	37596	7.67	-199.6	23.6	0.85	57843
13/12/2023	PW367	0089_PW367_231213	0.5	Peristaltic Pump	23.2	0.77	59157	38456	6.9	-379.2	23.2	0.96	59191
13/12/2023	PW368	0089_PW368_231213	0.5	Peristaltic Pump	26.1	0.16	61561	40024	7.16	-324.6	26.4	0.15	61667
13/12/2023	PW369	0089_PW369_231213	0.5	Peristaltic Pump	23.8	0.89	41311	26747	4.61	-267.9	23.8	0.81	41378
12/12/2023	PW374	0089_PW374_231212	0.2	Peristaltic Pump	26.1	2.71	55681	36197	7.52	-89.1	26.1	2.65	55688
12/12/2023	PW375	0089_PW375_231212	0.2	Peristaltic Pump	25.7	6.1	55649	36171	7.34	-87.2	25.8	4.15	55659
12/12/2023	PW378	0089_PW378_231212	0.3	Peristaltic Pump	26.1	5.62	56116	36491	7.8	-93.3	26.5	6.16	56254
14/12/2023	PW380	0089_PW380_231214	0.5	Peristaltic Pump	23	2.2	54969	35730	7.86	-66.1			
14/12/2023	PW381	0089_PW381_231214	0.5	Peristaltic Pump	23.3	1.69	54571	35471	7.8	-68.7			
14/12/2023	PW401	0089_PW401_231214	0.5	Peristaltic Pump	23	1.89	54809	35626	7.85	-64.5			
11/12/2023	PW405	0089_PW405_231211	0.3	Peristaltic Pump	25	1.07	57283	37228	7.52	-99.2	25.1	1.02	57277
11/12/2023	PW407	0089_PW407_231211	0.2	Peristaltic Pump	24.5	0.86	59915	38938	7.43	-94.9	24.5	0.8	59910
11/12/2023	PW409	0089_PW409_231211	0.2	Peristaltic Pump	25.4	0.83	63765	41443	7.48	-238.3	25.5	0.61	63800
13/12/2023	PW411	0089_PW411_231213	0.5	Peristaltic Pump	26.8	4.73	55411	36108	8.07	-61.3	26.8	4.68	55574
13/12/2023	PW413	0089_PW413_231213	0.5	Peristaltic Pump	26.3	1.94	55763	36252	7.59	-66	26.5	1.83	55809
13/12/2023	PW415	0089_PW415_231213	0.5	Peristaltic Pump	26.6	4.14	55034	35775	7.68	-63.7	26.6	3.79	55030

Monitoring Location	R2 - TDS (mg/L)	R2 - pH	R2 - Eh (mV)	R3 - Temp (oC)	R3 - DO (mg/L)	R3 - EC (us/Cm)	R3 - TDS (mg/L)	R3 - pH	R3 - Eh (mV)	QC Dup Sample #	Odour Comments	Colour
PW304	11858	7.78	-221	27.1	1.05	18257	11869	7.78	-219.5			Clear
PW306	35870	7.05	-341.6	26	0.19	65173	35869	7.05	-343		Sulphur	Clear
PW307	36333	7.68	-139	23.1	3.87	55955	36365	7.68	-138.4			Clear
PW308												Clear
PW314	36168	7.69	-77.9	25.7	4.3	55742	36236	7.68	-78.8			Clear
PW315	36340	7.67	-71.3	27.8	2.36	55853	36307	7.66	-70.6			Brown
PW316	33877	7.67	-79	24.5	3.75	52299	34019	7.67	-74.6			Clear
PW329											Slightly saline	Clear
PW330											Slightly saline	Clear
PW331											Saline	Clear
PW335	37340	7.65	-209.5	22.2	0.74	57446	37341	7.66	-211.5			Clear
PW340	38170	7.52	-214.1	25.1	1.02	58710	38172	7.53	-216			Clear
PW341	38169	7.53	-214.2	25	1.02	58720	38175	7.55	-216.3			Clear
PW345	40978	7.05	-295.5	22.7	1.32	63070	40993	7.05	-294.9			Cloudy
PW346	4581	7.95	-230.7	26.6	0.87	7042	4577	7.95	-229.7			Clear
PW350												Clear
PW351												Clear
PW352												Clear
PW356											Saline	Clear
PW357											Slightly saline	Clear
PW358											Slightly saline	Clear
PW362	38241	7.71	-158	23.6	1.47	58838	38245	7.72	-159			Clear
PW363	38752	7.8	-120.4	25.1	3.54	59625	38763	7.81	-124.4			Clear
PW364	37598	7.68	-200	23.7	0.86	57845	37600	7.69	-202.4	QC106/206		Clear
PW367	38474	3.9	-381.3	23.1	0.69	59222	38500	6.89	-382.3	QC115/215	Seaweed	Cloudy
PW368	40094	7.15	-327.7	26.7	0.14	61798	40184	7.14	-330.9			Clear
PW369	26974	7.61	-268.4	23.8	0.75	45264	29413	4.61	-269.8			Cloudy
PW374	36199	7.54	-89.3	26.2	2.61	55699	36207	7.55	-89.9			Clear
PW375	36177	7.39	-85	25.8	3.4	55670	36187	7.43	-88.9			Clear
PW378	36589	7.79	-94.3	26.7	5.34	56477	36726	7.77	-95.8	QC110/210		Clear
PW380												Clear
PW381												Clear
PW401												Clear
PW405	37228	7.52	-99.8	25.1	1.01	57260	37221	7.53	-100.3	QC103/203		Clear
PW407	38930	7.43	-95	24.5	0.8	59916	38934	7.43	-95			Clear
PW409	41481	7.48	274.5	25.6	0.49	63877	41527	7.48	-269			Clear
PW411	36121	8.07	-61.4	26.8	4.58	55572	36124	8.07	-61.4			Clear
PW413	36280	7.58	-66.4	26.6	1.74	55848	36303	7.58	-66.7			Clear
PW415	35772	7.69	-63.6	26.6	3.54	55031	35771	7.69	-63.5			Clear

Monitoring Location	Date	Sample ID	Sampling Method	Sample Depth (m)	WaterBody Depth (m)	Flow Rate	Dup #	Temperature (°C)	DO (mg/L)	EC (us/Cm)	TDS (mg/L)	pH	Eh (mV)	Water Colour	Turbidity
SW130	11/12/2023	0089_SW130_231211	Direct_into_Bottle	0.1	0.8	Medium		22.3	5.17	54435	35385	8.17	-21.2	Clear	Low
SW132	11/12/2023	0089_SW132_231211	Direct_into_Bottle	0.1	0.8	Medium	QC107/207	25.9	5.72	55465	36050	8.24	-46.8	Clear	Low
SW134	11/12/2023	0089_SW134_231211	Direct_into_Bottle	0.1	0.9	Medium		26.1	6.01	55524	36151	8.25	-52.4	Clear	Low
SW150	19/12/2023	0089_SW150_231219	Direct_into_Bottle	0.1	0.7	Medium		24.1	3.8	55940	36361	8.15	-125.2	Clear	Low
SW152	19/12/2023	0089_SW152_231219	Direct_into_Bottle	0.1	0.6	Medium		23.2	4.54	55730	36226	8.18	-134.2	Clear	Low
SW154	19/12/2023	0089_SW154_231219	Direct_into_Bottle	0.15	0.6	Medium		22.9	4.35	55355	35994	8.19	-132.6	Clear	Low
SW156	19/12/2023	0089_SW156_231219	Direct_into_Bottle	0.15	0.6	Medium		22.8	4.54	55321	35964	8.18	-139.5	Clear	Low
SW305	13/12/2023	0089_SW305_231213	Direct_into_Bottle	0.1	1.0	Medium		28.1	3.41	53386	34703	8.05	-183.4	Clear	Low
SW309	11/12/2023	0089_SW309_231211	Direct_into_Bottle	0.1	1.0	Medium		29.7	4.75			8.13	-45.3	Clear	Low
SW310	11/12/2023	0089_SW310_231211	Direct_into_Bottle	0.1	1.0	Medium		25.5	4.07	55231	35908	8.13	-190.3	Clear	Low
SW311	11/12/2023	0089_SW311_231211	Direct_into_Bottle	0.1	1.0	Fast		25	3.75	55802	36276	8.17	-54.3	Clear	Low
SW317	12/12/2023	0089_SW317_231212	Direct_into_Bottle	0.1	1.0	Slow	QC109/209	28.9	4.77	54703	35568	8.07	-93.5	Clear	Low
SW318	12/12/2023	0089_SW318_231212	Direct_into_Bottle	0.1	1.0	Slow		29.4	3.54	54760	35598	8.07	-93	Clear	Low
SW319	12/12/2023	0089_SW319_231212	Direct_into_Bottle	0.1	1.0	Slow		29.8	3.23	54779	35608	8.06	-92.8	Clear	Low
SW353	14/12/2023	0089_SW353_231214	Direct_into_Bottle	0.2	1.0	Medium		23.5	5.74	54447	35391	8.1	-55.6	Clear	Low
SW370	13/12/2023	0089_SW370_231213	Direct_into_Bottle	0.1	1.0	Slow		24.6	3.88	55870	36318	8.15		Clear	Low
SW371	13/12/2023	0089_SW371_231213	Direct_into_Bottle	0.1	1.0	Medium		28.2	3.75	52331	3013	7.96	-118.9	Clear	Low
SW372	13/12/2023	0089_SW372_231213	Direct_into_Bottle	0.1	1.0	Medium		27.6	4.82	52031	33821	7.97	-97.3	Clear	Low
SW373	13/12/2023	0089_SW373_231213	Direct_into_Bottle	0.1	1.0	Medium		27.1	3.29	52457	34084	7.98	-125	Clear	Low
SW382	14/12/2023	0089_SW382_231214	Direct_into_Bottle	0.1	1.0	Medium		23.5	5.55	54283	35284	8.14	-63.4	Clear	Low
SW383	14/12/2023	0089_SW383_231214	Direct_into_Bottle	0.15	1.0	Medium		23.8	4.89	54766	35598	8.12	-61.4	Clear	Low
SW384	14/12/2023	0089_SW384_231214	Direct_into_Bottle	0.2	1.0	Medium		23.8	4.74	54544	35453	8.1	-57.4	Clear	Low
SW406	11/12/2023	0089_SW406_231211	Direct_into_Bottle	0.1	1.0	Slow	QC104/204	28.7	3.62	58532	37987	8.18	-69.4	Clear	Low
SW408	11/12/2023	0089_SW408_231211	Direct_into_Bottle	0.1	1.0	Slow		29.7	5.81	56709	36849	8.2	-60.1	Clear	Low
SW410	11/12/2023	0089_SW410_231211	Direct_into_Bottle	0.1	1.0	Slow		34.1	6.86	59200	38643	8.4	-95.2	Clear	Low
SW412	13/12/2023	0089_SW412_231213	Direct_into_Bottle	0.1	0.8	Medium		28.2	4.59	54597	35497	8.03	-59	Clear	Low
SW414	13/12/2023	0089_SW414_231213	Direct_into_Bottle	0.1	0.9	Medium		27.3	3.58	56137	36501	8.04	-60.9	Clear	Low
SW416	13/12/2023	0089_SW416_231213	Direct_into_Bottle	0.1	0.9	Medium		28.4	4.74	55391	36039	8.1	-61.3	Clear	Low

Monitoring Location	Date	Sample ID	Sample ID 55	Depth of Sediment Sampling (m)	Sampling Method	Sample Condition	Sample Description	Duplicate #
SD304	13/12/2023	0089_SD304_231213	0089_SD304_231213	0.2	Showel, trowel	Wet	SAND: fine grained, yellow/black	
SD306	11/12/2023	0089_SD306_231211	0089_SD306_231211	0.5	Showel, trowel	Wet	Black sand	
SD307	11/12/2023	0089_SD307_231211	0089_SD307_231211	0.4	Showel, trowel	Wet	Black sand	
SD308	11/12/2023	0089_SD308_231211	0089_SD308_231211	0.3	Showel, trowel	Wet	Brown sand	
SD314	11/12/2023	0089_SD314_231211	0089_SD314_231211	0.5	Showel, trowel	Wet	Black sand	
SD315	11/12/2023	0089_SD315_231211	0089_SD315_231211	0.5	Showel, trowel	Wet	Black sand	
SD316	11/12/2023	0089_SD316_231211	0089_SD316_231211	0.5	Showel, trowel	Wet	Brown sand	
SD329	19/12/2023	0089_SD329_231219	0089_SD329_231219	0.5	Showel, trowel	Wet	Grey and white, fine grained SAND	
SD330	19/12/2023	0089_SD330_231219	0089_SD330_231219	0.5	Showel, trowel	Wet	Grey, med to fine grained SAND	
SD331	19/12/2023	0089_SD331_231219	0089_SD331_231219	0.5	Showel, trowel	Wet	White and grey, med to fine course grained SAND	
SD335	11/12/2023	0089_SD335_231211	0089_SD335_231214	0.5	Showel, trowel	Wet	Sand, fine to med grained, beige, trace organics	QC101/201
SD340	11/12/2023	0089_SD340_231211	0089_SD340_231211	0.8	Showel, trowel	Wet	Sand, fine to med grained, beige, trace organics	
SD341	11/12/2023	0089_SD341_231211	0089_SD341_231211	0.8	Showel, trowel	Wet	Sand, fine to med grained, beige, trace shells	
SD345	13/12/2023	0089_SD345_231213	0089_SD345_231213	0.8	Showel, trowel	Wet	Grey sand	
SD346	13/12/2023	0089_SD346_231213	0089_SD346_231213	0.5	Showel, trowel	Wet	SAND: fine grained, yellow/white	
SD350	14/12/2023	0089_SD350_231214	0089_SD350_231214	0.5	Showel, trowel	Wet	SAND: fine grained, yellow	
SD351	14/12/2023	0089_SD351_231214	0089_SD351_231214	0.5	Showel, trowel	Wet	SAND: fine grained, yellow	
SD352	14/12/2023	0089_SD352_231214	0089_SD352_231214	0.8	Showel, trowel	Wet	SAND: fine grained, yellow	
SD356	19/12/2023	0089_SD356_231219	0089_SD356_231219	0.5	Showel, trowel	Wet	White grey med to fine course SAND	
SD357	19/12/2023	0089_SD357_231219	0089_SD357_231219	0.4	Showel, trowel	Wet	Grey, med to fine grained SAND, with small shells	
SD358	19/12/2023	0089_SD358_231219	0089_SD358_231219	0.4	Showel, trowel	Wet	Grey, fine grained SAND, with seaweed	
SD362	11/12/2023	0089_SD362_231211	0089_SD362_231211	0.1	Showel, trowel	Wet	Sand, fine to med grained, beige, trace organics	
SD363	11/12/2023	0089_SD363_231211	0089_SD363_231211	0.9	Showel, trowel	Wet	Sand, fine to med grained, beige, trace organics	
SD364	11/12/2023	0089_SD364_231211	0089_SD364_231211	0.6	Showel, trowel	Wet	Sand, fine to med grained, beige, trace shells	
SD367	13/12/2023	0089_SD367_231213	0089_SD367_231213	0.8	Showel, trowel	Wet	Grey coarse sand	QC116/216
SD368	13/12/2023	0089_SD368_231213	0089_SD368_231213	0.2	Showel, trowel	Wet	SAND: fine grained, yellow/black, smells of seaweed	
SD369	13/12/2023	0089_SD369_231213	0089_SD369_231213	0.8	Showel, trowel	Wet	Grey sand	
SD374	12/12/2023	0089_SD374_231212	0089_SD374_231212	0.2	Showel, trowel	Wet	Sand	
SD375	12/12/2023	0089_SD375_231212	0089_SD375_231212	0.8	Showel, trowel	Wet	Sand	
SD378	12/12/2023	0089_SD378_231212	0089_SD378_231212	0.8	Showel, trowel	Wet	Sand	QC111/211
SD380	14/12/2023	0089_SD380_231214	0089_SD380_231214	0.8	Showel, trowel	Wet	SAND: fine grained, yellow	
SD381	14/12/2023	0089_SD381_231214	0089_SD381_231214	0.8	Showel, trowel	Wet	SAND: fine grained, yellow	
SD401	14/12/2023	0089_SD401_231214	0089_SD401_231214	0.5	Showel, trowel	Wet	SAND: fine grained, yellow	
SD405	11/12/2023	0089_SD405_231211	0089_SD405_231211	0.8	Showel, trowel	Wet	Sand fine to med grained, beige, trace organics	QC105/205
SD407	11/12/2023	0089_SD407_231211	0089_SD407_231211	0.5	Showel, trowel	Wet	Sand fine to med grained, beige, trace organics	
SD409	11/12/2023	0089_SD409_231211	0089_SD409_231211	0.8	Showel, trowel	Wet	Sand fine to med grained, beige, trace organics	
SD411	13/12/2023	0089_SD411_231213	0089_SD411_231213	0.8	Showel, trowel	Wet	Sand fine to med grained, beige, trace organics	
SD413	13/12/2023	0089_SD413_231213	0089_SD413_231213	0.8	Showel, trowel	Wet	Sand. Fine to med grained,beige,trace shells	
SD415	13/12/2023	0089_SD415_231213	0089_SD415_231213	0.8	Showel, trowel	Wet	Sand, fine to med grained, trace organics	

GK Environmental EQUIPMENT

Calibration Report

Multi-Parameter Water Quality Instrument

Customer:
Contact:

Manufacturer: YSI
Instrument: Professional Plus with Quatro cable
Serial #: 23G103462
Cable length: 1m (23G100262)

Item	Test	Pass	Comments
Battery	2 x Alkaline C-cells	✓	Voltage reading above 2.9V
	Battery Saver	✓	Automatically turns off after 30 minutes if not used
Connections	Condition	✓	Good, clean
Cable	Condition	✓	Clean, no tears
Display	Operation	✓	
Firmware	Version	✓	4.0.0
Keypad	Operational	✓	
Display	Screen	✓	
Unit	Condition, seals and O-rings	✓	
Monitor housing	Condition	✓	
pH			
Condition		✓	Good, clean
pH millivolts for pH7 calibration range 0 mV ± 50 mV		✓	
pH 4 mV range + 165 to + 180 from 7 buffer mV value		✓	174.60 mV
pH slope		✓	55 to 60 mV/pH, ideal 59mV 58.58
Response time < 90 seconds		✓	
Calibrated and conforms to manufacturer's specifications		✓	
ORP			
Condition		✓	Good, clean
Response time < 90 seconds		✓	
within ± 80mv of reference Zobell Reading		✓	
Calibrated and conforms to manufacturer's specifications		✓	variance range ± 20mV 8 mV
Conductivity			
Condition		✓	Good, clean
Temperature		✓	°C
Conductivity cell constant 5.0 ± 1.0 in GLP file		✓	
Clean sensor reads less than 3 uS/cm in dry air		✓	
Calibrated and conforms to manufacturer's specifications		✓	µs/cm
Dissolved Oxygen			
Condition		✓	Good, clean
DO sensor in use		✓	polarographic
1.25 mil PE membrane (yellow membrane):		✓	
DO Sensor Value		✓	(min 4.31 uA - max 8.00 uA) Avg 6.15 uA
Calibrated and conforms to manufacturer's specifications		✓	ppm

This is to certify that the above instrument has been calibrated to the following specifications:

						Instrument Readings		
Parameter	**Standards**	**Reference**	**Calibration Point**	**Span**	**Units**	**Before**	**After**	**Units**
Temperature (23G100242)	Check Temp NATA	Room Temp	21.8	-0.1	°C	NA	21.7	°C
pH (23F)	pH 7.00	392512	7.01	-6.10	mV	7.1	7.01	pH
pH (23F)	pH 4.00	394799	4.00	168.50	mV	4.06	4.00	pH
Conductivity (23G100242)	2764 µs/cm at 25°C	23/2308	2764	GLP	4.98	2780	2764	µs/cm
ORP (23E)	Zobell A & B	23/3006	236	236	mV	242	227.8	mV
Zero DO (23D100530)	NaSO3 in distilled water	10175	0.0	NA	NA	-0.1	0.0	%
100% DO (23D100530)	100% Air Saturation	Air	100.0	5.2	uA	78.9	100.0	%

Calibrated by: [redacted]

Calibration Date: 11-Nov-23
Next Due: 09-May-24

GK Environmental EQUIPMENT

Calibration Report

Multi-Parameter Water Quality Instrument

Customer:
Contact:

Manufacturer: YSI
Instrument: Professional Plus with Quatro cable
Serial #: 22C103026
Cable length: 1m (22B100428)

Item	Test	Pass	Comments
Battery	2 x Alkaline C-cells	✓	Voltage reading above 2.9V
	Battery Saver	✓	Automatically turns off after 30 minutes if not used
Connections	Condition	✓	Good, clean
Cable	Condition	✓	Clean, no tears
Display	Operation	✓	
Firmware	Version	✓	4.0.0
Keypad	Operational	✓	
Display	Screen	✓	
Unit	Condition, seals and O-rings	✓	
Monitor housing	Condition	✓	
pH			
Condition		✓	Good, clean
pH millivolts for pH7 calibration range 0 mV ± 50 mV		✓	
pH 4 mV range + 165 to + 180 from 7 buffer mV value		✓	174.70 mV
pH slope		✓	55 to 60 mV/pH, ideal 59mV 58.54
Response time < 90 seconds		✓	
Calibrated and conforms to manufacturer's specifications		✓	
ORP			
Condition		✓	Good, clean
Response time < 90 seconds		✓	
within ± 80mv of reference Zobell Reading		✓	
Calibrated and conforms to manufacturer's specifications		✓	variance range ± 20mV 8 mV
Conductivity			
Condition		✓	Good, clean
Temperature		✓	°C
Conductivity cell constant 5.0 ± 1.0 in GLP file		✓	
Clean sensor reads less than 3 uS/cm in dry air		✓	
Calibrated and conforms to manufacturer's specifications		✓	µs/cm
Dissolved Oxygen			
Condition		✓	Good, clean
DO sensor in use		✓	polarographic
1.25 mil PE membrane (yellow membrane):		✓	
DO Sensor Value		✓	(min 4.31 uA - max 8.00 uA) Avg 6.15 uA
Calibrated and conforms to manufacturer's specifications		✓	ppm

This is to certify that the above instrument has been calibrated to the following specifications:

						Instrument Readings		
Parameter	**Standards**	**Reference**	**Calibration Point**	**Span**	**Units**	**Before**	**After**	**Units**
Temperature (22B100315)	Check Temp NATA	Room Temp	22.5	0	°C	NA	22.5	°C
pH (22D)	pH 7.00	392512	7.01	-21.70	mV	7.04	7.01	pH
pH (22D)	pH 4.00	394799	4.00	153.00	mV	4.03	4.00	pH
Conductivity (22B100315)	2764 µs/cm at 25°C	23/2308	2764	GLP	4.99	2765	2764	µs/cm
ORP (22B)	Zobell A & B	23/3006	235	235	mV	223.6	226.7	mV
Zero DO (22E100254)	NaSO3 in distilled water	10175	0.0	NA	NA	-0.2	0.0	%
100% DO (22E100254)	100% Air Saturation	Air	100.0	6	uA	124.6	100.0	%

Calibrated by: [redacted]

Calibration Date: 06-Dec-23
Next Due: 03-Jun-24

GK Environmental EQUIPMENT

Calibration Report

Multi-Parameter Water Quality Instrument

Customer:
Contact:

Manufacturer: YSI
Instrument: Professional Plus with Quatro cable
Serial #: 23F102872
Cable length: 1m (23F100177)

Item	Test	Pass	Comments
Battery	2 x Alkaline C-cells	✓	Voltage reading above 2.9V
	Battery Saver	✓	Automatically turns off after 30 minutes if not used
Connections	Condition	✓	Good, clean
Cable	Condition	✓	Clean, no tears
Display	Operation	✓	
Firmware	Version	✓	4.0.0
Keypad	Operational	✓	
Display	Screen	✓	
Unit	Condition, seals and O-rings	✓	
Monitor housing	Condition	✓	
pH			
Condition		✓	Good, clean
pH millivolts for pH7 calibration range 0 mV ± 50 mV		✓	
pH 4 mV range + 165 to + 180 from 7 buffer mV value		✓	175.60 mV
pH slope		✓	55 to 60 mV/pH, ideal 59mV 58.6
Response time < 90 seconds		✓	
Calibrated and conforms to manufacturer's specifications		✓	
ORP			
Condition		✓	Good, clean
Response time < 90 seconds		✓	
within ± 80mv of reference Zobell Reading		✓	
Calibrated and conforms to manufacturer's specifications		✓	variance range ± 20mV 6 mV
Conductivity			
Condition		✓	Good, clean
Temperature		✓	°C
Conductivity cell constant 5.0 ± 1.0 in GLP file		✓	
Clean sensor reads less than 3 uS/cm in dry air		✓	
Calibrated and conforms to manufacturer's specifications		✓	µs/cm
Dissolved Oxygen			
Condition		✓	Good, clean
DO sensor in use		✓	polarographic
1.25 mil PE membrane (yellow membrane):		✓	
DO Sensor Value		✓	(min 4.31 uA - max 8.00 uA) Avg 6.15 uA
Calibrated and conforms to manufacturer's specifications		✓	ppm

This is to certify that the above instrument has been calibrated to the following specifications:

						Instrument Readings		
Parameter	**Standards**	**Reference**	**Calibration Point**	**Span**	**Units**	**Before**	**After**	**Units**
Temperature (23F100012)	Check Temp NATA	Room Temp	24.8	-0.1	°C	NA	24.7	°C
pH (23F)	pH 7.00	392512	7.01	-6.80	mV	7.08	7.01	pH
pH (23F)	pH 4.00	394799	4.00	168.80	mV	4.07	4.00	pH
Conductivity (23F100012)	2764 µs/cm at 25°C	23/2308	2764	GLP	5.15	2702	2764	µs/cm
ORP (23D)	Zobell A & B	23/3006	230	230	mV	244.3	223.4	mV
Zero DO (23C100524)	NaSO3 in distilled water	10175	0.0	NA	NA	-0.3	0.0	%
100% DO (23C100524)	100% Air Saturation	Air	100.0	5.4	uA	82.4	100.0	%

Calibrated by: [redacted]

Calibration Date: 16-Nov-23
Next Due: 14-May-24

Date of Bump Test	Site ID	Unit Brand/ Model	Ambient Air Oxygen Calibration	Zero % Oxygen Solution Calibration	Standard Concentrations	Ambient Temperature (°C)	Bump Test Reading	Bump Test Readings within ±5%?	Comment	Test by (Name)	(Signature)
12/12/23	0089-	YSI #22C[illegible]826	100% Saturation? Y N	0% Calibration? Y N NA	pH 4.00 Y/N pH 7.00 Y/N EC: 1,413µS/cm Y N 35,000 Y/N	24.1	pH 4.00: 4.18 pH 7.00: 7.0 EC: 34,544 1,6750	pH 4.00: (± pH 0.2) Y N pH 7.00: (± pH 0.2) Y N EC: (± 150µS/cm) Y N	N.I	[redacted]	
12/12/23	0089-	YSI #22FA[illegible]572	100% Saturation? Y N	0% Calibration? Y N NA	pH 4.00 Y/N pH 7.00 Y/N EC: 1,413µS/cm Y N 35,000 Y/N	24.0	pH 4.00: 4.11 pH 7.00: 7.02 EC: 1593 34,850	pH 4.00: (± pH 0.2) Y N pH 7.00: (± pH 0.2) Y N EC: (± 150µS/cm) Y N	N.I		
13/12/23	0089-	YSI #22FA[illegible]572	100% Saturation? Y N	0% Calibration? Y N NA	pH 4.00 Y/N pH 7.00 Y/N EC: 1,413µS/cm Y N 35,000 Y/N	23.2	pH 4.00: 4.15 pH 7.00: 6.98 EC: 34,898 1,342	pH 4.00: (± pH 0.2) Y/N pH 7.00: (± pH 0.2) Y/N EC: (± 150µS/cm) Y/N	N.I		
13/12/23	0089-	YSI #22G[illegible]468	100% Saturation? Y N	0% Calibration? Y N NA	pH 4.00 Y/N pH 7.00 Y/N EC: 1,413µS/cm Y N 35,000 Y/N	25.2	pH 4.00: 4.16 pH 7.00: 6.97 Temp: EC: 34,897 1,315	pH 4.00: (± pH 0.2) Y/N pH 7.00: (± pH 0.2) Y/N EC: (± 150µS/cm) Y N	N.I.		
13/12/23	0089-	YSI #22C[illegible]026	100% Saturation? Y N	0% Calibration? Y N NA	pH 4.00 Y/N pH 7.00 Y/N EC: 1,413µS/cm Y N	23.3	pH 4.00 4.16 pH 7.00: 6.97 Temp: 1,315 EC: 34580	pH 4.00: (± pH 0.2) Y/N pH 7.00: (± pH 0.2) Y/N EC: (± 150µS/cm) Y N	N.I		
14/12/23	0089-	YSI #23F[illegible]572	100% Saturation? Y N	0% Calibration? Y N NA	pH 4.00 Y / N pH 7.00 Y / N EC: 1,413µS/cm Y / N	19.8	pH 4.00: 4.15 pH 7.00: 6.88 Temp: 34896 EC: 1,315	pH 4.00: (± pH 0.2) Y / N pH 7.00: (± pH 0.2) Y / N EC: (± 150µS/cm) Y / N	N.I		
14/12/23	0089-	YSI #	100% Saturation? Y N	0% Calibration? Y N NA	pH 4.00 Y / N pH 7.00 Y / N EC: 1,413µS/cm Y / N		pH 4.00: pH 7.00: Temp: EC:	pH 4.00: (± pH 0.2) Y / N pH 7.00: (± pH 0.2) Y / N EC: (± 150µS/cm) Y / N			
19/12/23	0089-	YSI #22C[illegible]426	100% Saturation? Y N	0% Calibration? Y N NA	pH 4.00 Y/N pH 7.00 Y/N EC: 1,413µS/cm Y/N EC: 35,000 Y/N	22.5	pH 4.00: 4.16 pH 7.00: 7.04 Temp: 22.2 EC: 1840 EC: 34,570	pH 4.00: (± pH 0.2) Y/N pH 7.00: (± pH 0.2) Y/N EC: (± 150µS/cm) Y/N EC: (± 35000 µS/cm) Y/N	N.I		

APPENDIX

E

DATA QUALITY REVIEW

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Data Quality Review
PFAS Ongoing Monitoring Plan
Q4 2023 Monitoring Event

This appendix reviews the Quality Assurance (QA) and Quality Control (QC) documentation. Quality assurance encompasses the actions, procedures, checks and decisions undertaken to ensure sample integrity and representativeness, and the reliability and accuracy of analysis results. The QA documentation should also include an indication of the Data Quality Objectives sought in relation to each significant action, test or process involved in the assessment.

QC activities measure the effectiveness of the QA procedures by undertaking testing, and then comparing results to previously established objectives. QC work will include the internal laboratory testing as well as results of QC samples submitted such as trip blanks and duplicates. The quality of the information and/or data is deemed satisfactory when the QC results demonstrate that agreed objectives have been met.

QA/QC Aspects	Evidence & Evaluation
	QA Documentation
Project Quality Plan/Work Plan and Data Quality Objectives	The field investigation was carried out between the 11th and 19th December 2023 and is generally in accordance with the proposed scope of work, as documented in the SAQP (PFAS OMP SAQP HMAS Stirling, Cardno, December 2023, Rev12) issued to the client and in general compliance with Standards Australia 1998. AS/NZ 5667:1998 *Water quality – sampling,* NEPM "*National Environment Protection (Assessment of Site Contamination) Measure"* and PFAS NEMP 2.0. A quality control program was implemented during the Investigation and the quality assurance procedures used have been reiterated in the report (PFAS OMP Q4 2023 Factual Report). In addition, a safety, health and environment work method statement (SHEWMS) was also prepared. The Data Quality Objectives were expressed in terms of the purpose of the assessment and the relevant assessment criteria.
	Data Representativeness
Use of Composites	No Composites were used during the investigation
Holding Times	Chain of custody and laboratory reports provide evidence of holding times. Holding times complied with required timeframes.
Verification of field procedures	The methodology conducted during this investigation is documented in the body of the report and was in general conformance with the SAQP. Non-disposable equipment was decontaminated between sample locations.
Laboratory Reports	The following laboratory reports were considered for this data quality review: ▪ ALS reports: EP2317554, EP2317555, EP2317556, EP2317575, EP2317576, EP2317577, EP2317627, EP2317628, EP2317629, EP2317630, EP2317690, EP2317691, EP2317693, EP2317700, EP2317701, EP2317702, EP2317729, EP2317755, EP2317756, EP2317757, EP2317849, EP2317850, EP2318014, EP2318016, EP2318017. ▪ Eurofins report: 1053798

QA/QC Aspects	Evidence & Evaluation

Data Precision & Accuracy

QC sample Frequency

QC sample type	SAQP required frequency	Sample Collected
Blind duplicate	1 in 10 primary samples (10%)	7 for 56 groundwater samples (12.5%) 4 for 39 porewater samples (10.3%) 3 in 27 surface water samples (10.7%) 4 in 39 sediment samples (10.3%)
Interlab duplicate	1 in 10 primary samples (10%)	7 for 56 groundwater samples (12.5%) 4 for 39 porewater samples (10.3%) 3 in 28 surface water samples (10.7%) 4 in 39 sediment samples (10.3%)
Rinsate	1 per field crew per day	10 for 5 days (1 to 3 field personnel/day) (100%)
Field Blank	1 per field crew per day	10 for 5 days (1 to 3 field personnel/day) (100%)

The required QC frequency was achieved for all sample types.

RPD Acceptance criteria

Magnitude of Results	Acceptable RPD range
< 10 x LOR	No limits
10 – 20 LOR	0% - 50%
> 20 x LOR	0% - 20%

QC Testing – Blind Duplicates (Primary Lab)

Groundwater

- Primary Groundwater Samples Analysed: 56
- Blind Duplicate Samples Analysed: 7

RPDs were within acceptance criteria with one exception for QC118 (PFOS – 32%). This minor exceedance is likely due to the low concentrations of analyte. The higher value has been adopted for the assessment (conservative approach).

Porewater

- Primary porewater Samples Analysed: 39
- Blind Duplicate Samples Analysed: 4

All RPDs were within acceptance criteria.

Surface water

- Primary surface water Samples Analysed: 28
- Blind Duplicate Samples Analysed: 3

All RPDs were within acceptance criteria.

Sediment

- Primary Sediment Samples Analysed: 39
- Blind Duplicate Samples Analysed: 4

All RPDs were within acceptance criteria.

QC Testing – Interlab Duplicates (Secondary Lab)

Groundwater

- Primary Groundwater Samples Analysed: 56
- Interlab Duplicate Samples Analysed: 7

RPDs were within acceptance criteria with the following exceptions:

QA/QC Aspects	Evidence & Evaluation
	▪ QC202 (PFPeS – 50%, PFHxS – 42%, PFOA – 22%, 6:2 FTS – 27%) ▪ QC208 (PFPeS – 23%, PFOS – 21%, PFOA – 117%) ▪ QC213 (PFHxS – 44%, PFHpS – 29%, PFOS – 52%PFOA – 39%, FOSA – 65% ▪ QC218 (PFOS – 76%, PFHxA – 21%, 6:2 FTS – 64%). These RPDs difference are likely due to the differences of methodologies between the primary and secondary laboratories and/or low concentrations of analytes under review. The higher concentrations were adopted for this assessment (conservative value reported on). This is not considered to have impacted the validity of the interpretation drawn upon this dataset. ***Porewater*** ▪ Primary porewater Samples Analysed: 39 ▪ Interlab Duplicate Samples Analysed: 4 All RPDs were within acceptance criteria with one exception: QC215 (Sum of PFOS and PFHxS – 138%) which is due to the low concentration levels as the individual analytes didn't report a RPD exceedance. The higher concentration was adopted for this assessment (conservative value reported on). This is not considered to have impacted the validity of the interpretation drawn upon this dataset. ***Surface water*** ▪ Primary surface water Samples Analysed: 28 ▪ Interlab Duplicate Samples Analysed: 3 All RPDs were within acceptance criteria. ***Sediment*** ▪ Primary sediment Samples Analysed: 39 ▪ Interlab Duplicate Samples Analysed: 4 All RPDs were within acceptance criteria.
Field Blanks	Field Blanks were collected at a rate of one per fieldwork day per field personnel. All field blank samples tested reported analytes below the laboratory limit of reporting.
Laboratory Internal QC	Evidence of the laboratories internal QC testing is present and complete in the reports. ALS (Primary) performed internal QC with adequate testing and satisfactory results for method blank, matrix spikes, laboratory control samples and laboratory duplicates. All Method Blank and Laboratory Control results were within acceptable range. All Matrix Spikes generally reported recoveries within the acceptance range of 70% to 130% with the exception of the following: ▪ EP2317554, EP2317555, EP2317575, EP2317576, EP2317629, EP2317690, EP2317701, EP2317850, EP2318014: - Samples ID: PW405, SW130, SW318, PW367, PW358, Anonymous: Sulfate and Chloride matrix spike recoveries not determined due to the background concentrations exceeding 4x spike level. ▪ EP2317554, EP2317575: - Samples ID: Anonymous, MW289: PFOS matrix spike recoveries not determined due to the background concentrations exceeding 4x spike level. ▪ EP2317627, EP2317729, EP2317756, EP2317849, EP2318017: - Samples ID: MW268, MW200, Anonymous: Chloride matrix spike recoveries not determined due to the background concentrations exceeding 4x spike level. ▪ EP2318016: - Sample: Anonymous: PFPeS recovery greater than upper data quality objective - Sample: Anonymous: PFOS matrix spike recoveries not determined due to the background concentrations exceeding 4x spike level.

QA/QC Aspects	Evidence & Evaluation
	All surrogate recovery were within acceptable limits with the exception of the following: ▪ EP2317554, EP2317575: - PW329: PFAS Surrogate: 13C4-PFOS and 13C8-PFOA recovery greater than upper data quality objective. The frequency of laboratory QC samples was generally achieved with the exception of the following: ▪ EP2317554, EP2317575: - Matrix Spikes: PFAS by LCMSMS, expected frequency 5% not achieved. ▪ EP2317555, EP2317576, EP2317627, EP2317628, EP2317629, EP2317756, EP2317757, EP2317850, EP2318017: - Laboratory Duplicates: PFAS by LCMSMS, expected frequency 10% not achieved. - Matrix Spikes: PFAS by LCMSMS, expected frequency 5% not achieved. ▪ EP2317627: - Laboratory Duplicates: Chloride by Discrete Analyser, expected frequency 10% not achieved. - Matrix Spikes: Sulfate by Discrete Analyser, expected frequency 5% not achieved. ▪ EP2318014: - Laboratory Duplicates: Major cations dissolved, expected frequency 10% not achieved. - Laboratory Control Samples: Major cations dissolved, expected frequency 5% not achieved. - Method Blanks: Major cations dissolved, expected frequency 5% not achieved. The above outliers/exceptions are not considered to affect the reliability of the dataset.
Laboratory Method Detection Limit	Laboratory reports indicate the method detection limits were generally lower than the respective assessment criteria.
NATA endorsement of laboratory reports	Laboratory reports were stamped with the NATA endorsement stamp and signature. ALS Accreditation No. 825 Eurofins ARL Accreditation No. 1261
Calibration of Field Equipment	All equipment used during the investigation was calibrated by the supplier prior to use and daily readings of reference solutions (bump tests) were completed. The equipment calibration certificates, and daily field bump test records are provided in Appendix D.
Decontamination and Equipment Blanks	Rinsate blanks were collected at a rate of one per day per field personnel when reusable equipment was used. All rinsate samples tested reported analytes concentrations below the laboratory LORs.
	Data Comparability
Standard Procedures	Fieldwork procedures are detailed in the SAQP and reports and are comparable for each phase of Investigation.
Qualified Personnel	Staff involved in managing and reviewing the project and those involved in fieldwork are experienced and qualified personnel.
Sample Integrity	Field Chain of Custody/Laboratory request forms can be found in Appendix C.
	Data Completeness
Completeness of test program	The scope of work undertaken was generally consistent with the SAQP.

QA/QC Aspects	Evidence & Evaluation
Validity of Data Set	The data quality review indicates no significant systematic errors in the data collection process and therefore, the data set used as the basis for groundwater, surface water, porewater and sediment investigation is considered valid and complete.

PFAS OMP Quarterly Sampling Event Factual Report

March 2024

HMAS Stirling

304700525



Prepared for
Department of Defence

14 May 2024

Cardno

now

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[redacted]

Senior Environmental Engineer

[redacted]

Principal Environmental Engineer

Document History

Version	Effective Date	Description of Revision	Prepared by	Reviewed by
A	01/04/2024	Draft	MB	DJ
B	13/05/2024	Second Draft	MB	DJ
0	14/05/2024	Final	MB	DJ

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

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Chemical Names

DO	Dissolved Oxygen
PFAS	Per- and Poly-fluoroalkyl Substances
PFHxS	Per-fluorohexane Sulfonate
PFOA	Per-fluorooctanoic Acid
PFOS	Per-fluorooctane Sulfonate

Technical Terms

AFFF	Aqueous Film Forming Foam
AHD	Australian Height Datum
AS	Australian Standard
BGL	Below Ground Level
COC	Chain of Custody
DQI	Data Quality Indicator
DQO	Data Quality Objective
DSI	Detailed Site Investigation
DWER	Department of Water and Environmental Regulation
EC	Electrical Conductivity
EPA	Environment Protection Authority
ERA	Ecological Risk Assessment
ESA	Environmental Site Assessment
HEPA	Heads of Environmental Protection Authority
LOR	Limit of Reporting
N/A	Not Applicable
NATA	National Association of Testing Authorities
NEPC	National Environment Protection Council
NEMP	National Environmental Management Plan
NEPM	National Environmental Protection Measure
ORP	Oxidation Reduction Potential
PSI	Preliminary Site Investigation
QA	Quality Assurance
QC	Quality Control
RPD	Relative Percentage Difference
RWL	Reduced water levels
SAQP	Sampling and Analysis Quality Plan
SWL	Standing water level

Units

ha	Hectares
mAHD	Metres relative to the Australia Height Datum
mBGL	Metres Below Ground Level
mbTOC	Metres below Top of Casing
mg/kg	Milligram per Kilogram (approximately equivalent to ppm)
mg/L	Milligram per Litre
mV	Millivolt
µg/L	Microgram per Litre
µS/cm	Micro Siemens per Centimetre (Electrical Conductivity – Water)

Site Specific

OMP	Ongoing Monitoring Plan
FTA	Fire Training Area
HSF	Helicopter Support Facility

1 Introduction

1.1 Background

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

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

> Cardno, February 2024, Reference: DEF19009, *PFAS Ongoing Monitoring Plan Sampling and Analysis Quality Plan (SAQP) HMAS Stirling.* Rev 13.

The SAQP was reviewed and updated prior to the Q1 2024 monitoring event. No changes relevant to this monitoring event were made.

For the purposes of this report:

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

1.2 Purpose & Objectives

The objective of the OMP is to assess the changes in the nature and extent of PFAS within the environment, specifically where there is an identified potentially elevated risk to a receptor or a potential future risk to a receptor associated with Defence's historical use of legacy Aqueous Film Forming Foam (AFFF). The PFAS source areas are shown on Figure 1B, Appendix A.

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

The objectives of the report are to provide:

> A succinct summary of the Q1 2024 sampling event and provision of analytical results with supporting tables and figures.

> Confirmation of the current understanding of risk.

> Supporting data for the assessment of management actions, where relevant.

1.3 Relevant Guidelines

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

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

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

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

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

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

[1] It is acknowledged that AS4482 has been withdrawn, it is referred to here as a state of knowledge only.

- Department of Water and Environmental Regulation (DWER), 2021, *Assessment and Management of Contaminated Sites*[2].
- Department of Defence, Department of Energy, 2018, *Quality System Manual Schedule B15*.
- U.S. Environmental Protection Agency (EPA), 2000, *Guidance for the Data Quality Objectives Process (EPA QA/G-4)*.
- U.S. EPA, 2002, *Guidance on Environmental Data Verification and Data Validation (EPA QA/G-8).*
- National Health and Medical Research Council (NHMRC), August 2019, *Guidance on Per and Polyfluoroalkyl Substances (PFAS) in Recreational Water*.

2 Scope of Work

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

2.1 Groundwater Monitoring

Sampling of selected groundwater monitoring wells was performed in general accordance with the SAQP (Cardno, 2024), applying methods set out in Section 3.1 of this report. The groundwater wells monitored as part of the OMP are presented in Table 2-1, and are shown on Figures 2A and 2B, Appendix A.

Table 2-1 Groundwater Monitoring Locations

Monitoring Area	Location ID	No.
Demolition Ground	MW139, MW141, MW142, MW147, MW149	5
Fire Training Area	MW109, MW112, MW500, MW120, MW121, MW123, MW124, MW125, MW126, MW127, MW128	11
Wastewater treatment plant	MW158, MW161, MW166, MW171, MW173, MW193, MW195D, MW195S, MW196, MW197, MW199, MW200, MW202, MW203	14
Accommodation Area	MW288, MW289	2
Dredged Sediments	MW268, MW269	2
AVCAT Storage and Fuel Farm	MW233, MW236, MW238, MW239, MW240, MW242, MW243, MW245, MW249, MW496, MW516	11
Fire Station, Flammable / Hazardous Goods and Waste Storage, Ship Sullage	MW255, MW256, MW257, MW258, MW259	5
Helicopter Support Facility	MW214, MW215, MW216, MW217, MW220, MW224, MW225, MW226, MW227, MW228, MW282	11

2.2 Porewater, Surface Water and Sediment Monitoring

Porewater, sediment and surface water sampling were performed in general accordance with the SAQP (Cardno, 2024), applying methods set out in Sections 3.2 and 3.3 of this report. The porewater, surface water and sediment monitoring locations monitored as part of the OMP are presented in Table 2-2, and are shown on Figures 3A to 5B, Appendix A.

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

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

Monitoring Area	Porewater Sampling Location ID	No.	Sediment Sampling Location ID	No.	Surface Water Sampling Location ID	No.
Demolition Ground	PW329, PW330, PW331, PW356, PW357, PW358	6	SD329, SD330, SD331, SD356, SD357, SD358	6	SW150, SW152, SW154, SW156	4
Fire Training Area	PW335, PW340, PW341, PW362, PW363, PW364	6	SD335, SD340, SD341, SD362, SD363, SD364	6	SW130, SW132, SW134	3
WWTP	PW304, PW345, PW367, PW368, PW369, PW350, PW351, PW352, PW380, PW381, PW401	11	SD304, SD345, SD367, SD368, SD369, SD350, SD351, SD352, SD380, SD381, SD401	11	SW305, SW370, SW371, SW372, SW373, SW353, SW382, SW383, SW384	9
Accommodation Area	PW346	1	SD346	1		
Dredged Sediments	PW374, PW375, PW378	3	SD374, SD375, SD378	3	SW317, SW318, SW319	3
Helicopter Support Facility	PW306, PW307, PW308, PW314, PW315, PW316, PW405, PW407, PW409, PW411, PW413, PW415	12	SD306, SD307, SD308, SD314, SD315, SD316, SD405, SD407, SD409, SD411, SD413, SD415	12	SW309, SW310, SW311, SW406, SW408, SW410, SW412, SW414, SW416	9

2.3 Data Management

All the data included in the report has been collected, uploaded, and reviewed according to the data management requirements of the *Defence Contamination Management Manual* (DCMM) Annex L (Defence, 2021), including:

- The sample naming convention detailed in the DCMM Annex L was used in the field;
- All field data collected was uploaded to the Esdat database;
- Laboratory data was uploaded and approved; and
- QA/QC data was reconciled.

2.4 Deviations from the OMP SAQP

Deviations from the SAQP for the Q1 2024 monitoring event are presented in Table 2-3 below.

Table 2-3 Deviations from OMP SAQP

Location	Deviation	Comments/Impact
MW197	Not sampled	Well casing silted up, unable to unblock with a steel bailer due to the size of PVC casing (too narrow). Limited impact, this well was found dry during most monitoring events, nearby wells were sampled.

3 Methodology

3.1 Groundwater Sampling Methodology

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

Table 3-1 Groundwater Sampling Methodology

Activity	Details
Well Gauging	Standing water levels (SWL) were gauged using a dip meter. All wells were measured against a surveyed mark at the top of the well casing. Time of gauging was recorded on field records sheets.
Groundwater Field Parameters	Groundwater physicochemical parameters were recorded via a water quality meter from water remaining in the HydraSleeves® after samples are collected or hand-bailed water. The following physicochemical parameters were recorded: ▪ pH ▪ electrical conductivity (EC) ▪ oxidation reduction potential (ORP) ▪ Dissolved oxygen (DO) ▪ Temperature Once physicochemical parameters had 4inimize4d (as indicated by at least three consecutive measurements falling within +/- 10% of each other) measurements were recorded on field data records. All field instruments (e.g. water quality meter) were calibrated by the equipment supplier and bump tested daily to 4inimize the accuracy of the measurements taken. Calibration certificates and bump test records are provided in Appendix D.
Deployment of HydraSleeve®	HydraSleeve® were deployed with top weight for sample collection to begin at the lowest point. Following Q1 2024 sampling, new HydraSleeve® were deployed in preparation for the next OMP monitoring event scheduled for Q2 2024, using the same string for consistency (same depth of sampling i.e. within screen depth). HydraSleeve's target depth was recorded on field records for each location.
Retrieval of HydraSleeve® (Sample Collection)	HydraSleeve® sampling devices were left in wells for a minimum of 24 hours to allow restabilisation of the well following the slight disturbance caused by sampler deployment. HydraSleeve® used during Q1 2024 were the ones deployed following Q4 2023. Samples were collected via continuous pull method at a rate allowing the water to pass through the check value into the sample sleeve. Samples were discharged immediately (4inimize changes in chemistry) via discharge tube.
Hand bailing (alternative sampling method)	Disposable HDPE hand bailers, attached to a polypropylene string, were used at wells where the water column wasn't sufficient to fill the HydraSleeve®. Purging of the well was undertaken prior to sampling to ensure that a sample representative of the aquifer is taken (i.e. removal of 3x well volume).
Decontamination procedure	Dedicated HydraSleeve® and HDPE hand bailers (single use and disposable) were used at each groundwater well thus removing the need for decontamination. All re-usable sampling equipment was thoroughly washed using PFAS & phosphate-free detergent, then double rinsed with clean water before the sample collection.
Sample identification, preservation transport and holding times	Each sample bottle was pre-labelled by the laboratory with a unique barcode. Samples were collected directly into appropriately preserved laboratory supplied bottles (Teflon-free) and packed in chilled containers for delivery to the laboratory under Chain of Custody (CoC) documentation. Sample containers, preservation procedures, sample storage requirements and holding times were undertaken in accordance with those recommended by Standards Australia (AS/NZS 5667.1:1998 and AS 4482.1 as appropriate). Where holding times did not comply, this is discussed in the data quality review in Appendix E.

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

3.2 Porewater and Sediment Sampling Methodology

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

Table 3-2 Sediment Sampling Methodology

Item	Details
Sample Collection	Sediment samples were collected at the sediment/water interface using hand tools (e.g. trowel, hand auger, PVC pipe etc.) with samples placed directly into appropriately labelled, laboratory supplied sample containers and packed in chilled containers for delivery to the laboratory under CoC documentation.
Field Parameters	At each sampling location, the sediment sample was visually assessed, and observations (including physical description) were recorded on field data sheets.
Decontamination	All re-usable sampling equipment was thoroughly washed using PFAS-free detergent, then double rinsed with clean water before the sample collection.
Quality Control	Sediment QC samples were collected at the following frequencies: ▪ Field duplicate (intra-laboratory) samples greater than 1 per 10 primary samples. ▪ Field triplicate (inter-laboratory) samples greater than 1 per 10 primary samples sent to a secondary laboratory.
Laboratory Testing	Sediment samples were submitted for the following analysis: ▪ Full PFAS analytical suite (refer to the SAQP for full list of analytes).

Table 3-3 Porewater Sampling Methodology

Item	Detail
Porewater Sample Collection	Porewater sampling was undertaken in accordance with the U.S. EPA guidance *Operating Procedure Pore Water Sampling*. Porewater was purged and sampled at less than 1 L per minute using a peristaltic pump, connected to a stainless steel tube with a screened section at its base (Drive-Point Piezometer). The porewater sampler was inserted to at least 1 m below the surficial marine sediments, to ensure collection of pore water rather than surface water. Tubing was replaced at each sampling location to prevent cross-contamination.
Field parameters	The following physicochemical parameters were recorded using a pre-calibrated water quality meter: ▪ pH ▪ EC ▪ ORP ▪ DO ▪ Temperature

Item	Detail
Decontamination	All re-usable sampling equipment was thoroughly washed using PFAS-free detergent, then double rinsed with clean water before the sample collection.
Sample identification, preservation, transport and holding times.	As detailed in Table 3-1.
Quality Control	Porewater QC samples were collected at the following frequencies: ▪ Field duplicate (intra-laboratory) samples at 1 per 10 water samples or 1 per batch if the batch was less than 10 samples. ▪ Field triplicate (inter-laboratory) samples at 1 per 10 water samples sent to a secondary laboratory.
Laboratory Testing	Porewater samples were submitted for the same analysis as groundwater samples (refer to Table 3-1).

3.3 Surface Water Sampling Methodology

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

Table 3-4 Surface water Sampling Methodology

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

3.4 Quality Control / Quality Assurance

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

> QA documentation.

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

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

3.5 Assessment Criteria

3.5.1 Groundwater, Porewater and Surface Water

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

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

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

Notes:

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

3.5.2 Sediment

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

4 Field Observations and Results

4.1 General Site Observations

The Q1 2024 monitoring event was completed between 11 and 13 March 2024. No significant weather events or site activities that could have impacted the reliability of the results obtained were noted during Q1 2024.

The daily maximum temperature during the monitoring event varied between 28.5 and 31.1°C and no rainfall occurred.

4.2 Groundwater

4.2.1 Summary of Field Observations

4.2.1.1 Physicochemical parameters

Stabilised physicochemical parameters, water colour and turbidity observations recorded during the groundwater sampling event are presented in field sampling records, included in Table D1, Appendix D.

Field parameters were generally consistent with previous monitoring events. Groundwater pH ranged from 6.92 (MW141) to 10.9 (MW257) and was near neutral to alkaline, and water was observed clear to cloudy/brown in colour. Groundwater temperature ranged from 19.1°C (MW233) to 26.8°C (MW139). DO readings ranged from 0.28 mg/L (MW127) to 5.00 mg/L (MW217) which indicates aerobic groundwater conditions. EC readings ranged from 303.2 µS/cm (MW233) to 50,440 µS/cm (MW125) and indicate fresh to highly saline groundwater conditions. There was a sulphur odour noted at MW126, MW127 and MW220. A hydrocarbon odour was reported at MW199, MW240, MW243, MW245, MW496 and MW516.

4.2.1.2 Groundwater Elevation and Migration

Groundwater gauging data and reduced water levels (RWL) are provided within the field records in Table D1, Appendix D. The groundwater elevations ranged between -0.079 mAHD (MW158) and 0.583 mAHD (MW171) which is consistent with previous monitoring events. An outlier RWL of 2.2 mAHD was recorded at MW123 (assumed to be an equipment malfunction) and was not used to interpret groundwater contours. It is expected that groundwater levels and flow direction for monitoring well relatively close to the shoreline are locally and temporally influenced by tidal pressures.

Gauging data was used to infer the groundwater migration contours. Groundwater flow was interpreted to be radial from the site and towards areas of depression following local topography (i.e. groundwater generally flows towards the nearest coastline), which is consistent with previous monitoring events. Groundwater inferred elevation contours and inferred flow direction for the Q1 2024 monitoring event are shown in Figure 6, Appendix A. It is noted that no contours could be interpreted for the demolition ground due to the limited number of wells and their proximity to each other.

4.2.2 Laboratory Results

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

Table 4-1 Summary of Groundwater Results Exceeding Adopted Criteria

Analytes	Locations Exceeding Criteria	Lowest Criteria (µg/L)	Max Conc. (µg/L)	No. Analytical Results[1]	No. Results Above Criteria
PFOA	MW112, MW123, MW141, MW193, MW236, MW256, MW282, MW500	0.56[2]	5.24 (MW282)	60	8
Sum of PFOS and PFHxS	MW109, MW112, MW120, MW121, MW123, MW125, MW128, MW141, MW142, MW161, MW166, MW171, MW173, MW193, MW203, MW215, MW216, MW217, MW220, MW228, MW233, MW236, MW240, MW249, MW255, MW256, MW257, MW258, MW259, MW268, MW269, MW282, MW288, MW289, MW496, MW500, MW516	0.07[2]	99.7 (MW282)	60	37
PFOS	MW109, MW112, MW120, MW121, MW123, MW128, MW141, MW142, MW147, MW161, MW166, MW171, MW173, MW193, MW202, MW215, MW216, MW217, MW220, MW233, MW236, MW242, MW245, MW249, MW255, MW256, MW257, MW258, MW259, MW269, MW282, MW288, MW289, MW496, MW500, MW516	0.01[3]	62.9 (MW282)	60	36

Notes:

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

Findings are summarised as follows:

- No first-time detection of Sum of PFOS and PFHxS or PFOA above the LOR were reported for the groundwater monitoring locations in Q1 2024.
- A new exceedance of the PFOS LOR, adopted as a screening level for ecological protection was recorded at MW215 located at the HSF (0.01 µg/L recorded).

4.3 Surface Water

4.3.1 Summary of Field Observations

4.3.1.1 Physicochemical parameters

Stabilised physiochemical parameters and observations recorded during the surface water sampling program are presented in field sampling records, included in Table D3, Appendix D. Parameters were generally consistent with the previous monitoring events. Surface water pH ranged from 6.88 (SW353) to 8.17 (SW152) and was near neutral, temperature was 23.6°C on average, water was noted clear to brown and EC readings ranging 30,872 µS/cm (SW384) to 62,033 µS/cm (SW130) indicate highly saline surface water conditions. DO readings ranging 1.04 mg/L (SW370) to 7.40 mg/L (SW311) indicate aerobic surface water conditions. No visual or olfactory evidence of contamination were recorded.

4.3.2 Laboratory Results

The results of laboratory analysis have been compared against adopted assessment criteria. A summary of results exceeding the adopted criteria is presented in Table 4-2. Laboratory results have also been compared to available historical data to identify monitoring locations where a first-time detection of Sum of PFOS and PFHxS or PFOA or a new exceedance of guideline values, were reported. Figures 3A and 3B in Appendix A present the surface water monitoring locations. Tabulated results including non-PFAS analytes are presented in Table B1, Appendix B and the laboratory reports are provided in Appendix C.

Table 4-2 Summary of Surface water Results Exceeding Adopted Criteria

Analytes	Locations Exceeding Criteria	Lowest Criteria (µg/L)	Max Conc. (µg/L)	No. Analytical Results[1]	No. Results Above Criteria
PFOA	-	0.56[2]	<0.01 (all)	28	0
Sum of PFOS and PFHxS	SW305, SW371, SW372, SW373	0.07[2]	0.79 (SW305)	28	4
PFOS	SW130, SW132, SW150, SW156, SW305, SW309, SW370, SW371, SW372, SW373	0.01[3]	0.75 (SW305)	28	10

Notes:

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

Findings are summarised as follows:

- A first-time detection of Sum of PFOS and PFHxS above the LOR was recorded at SW156 located at the demolition grounds (0.04 µg/L recorded).
- SW156 reported a new exceedance of the PFOS LOR, adopted as an ecological screening level (0.04 µg/L recorded).

4.4 Porewater

4.4.1 Summary of Field Observations

4.4.1.1 Physicochemical parameters

Stabilised physiochemical parameters, water colour and turbidity observations recorded during the porewater sampling program are presented in field sampling records, included in Table D2, Appendix D. Parameters were generally consistent with the previous monitoring events. Porewater pH ranging 6.98 (PW345) to 8.06 (PW381) was near neutral, with an average temperature of 23.1°C. Water was generally clear/cloudy or black in some instances (PW357, PW411). EC readings ranging 41,298 µS/cm (PW407) to 65,187 µS/cm (PW364) indicate highly saline porewater conditions. DO readings ranging 0.10 mg/L (PW335) to 6.02 mg/L (PW308) indicate anaerobic to aerobic porewater condition.

4.4.2 Laboratory Results

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

Table 4-3 Summary of Porewater Results Exceeding Adopted Criteria

Analytes	Locations Exceeding Criteria	Lowest Criteria (µg/L)	Max Conc. (µg/L)	No. Analytical Results[1]	No. Results Above Criteria
PFOA	-	0.56[2]	<0.01 (all)	39	0
Sum of PFOS and PFHxS	PW304*, PW346, PW367, PW368	0.07[2]	0.15 (PW346)	39	4
PFOS	PW304, PW335, PW340, PW341, PW345, PW346, PW357, PW364, PW367, PW368, PW369, PW374, PW375, PW405*	0.01[3]	0.14 (PW346)	39	14

Notes:

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

*Inter-lab duplicate result adopted.

Findings are summarised as follows:

> There was no first-time detection of Sum of PFOS and PFHxS or PFOA, or new exceedance of a guideline value for the porewater locations during Q1 2024.

4.5 Sediment

4.5.1 Summary of Field Observations

Observations recorded during the sediment sampling program are provided in the field sampling records within Appendix D. Sediment samples were generally described as yellow, fine to medium grained, wet sand.

4.5.2 Laboratory Results

The results of laboratory analysis have been compared to available historical data. Figures 5A and 5B in Appendix A present the sediment monitoring locations. Tabulated results are presented in Appendix B and the laboratory reports are provided in Appendix C.

Findings are summarised as follows:

> No first-time detection of Sum of PFOS and PFHxS or PFOA was reported for the sediment monitoring locations in Q1 2024.

4.6 Changes to the Monitoring Network Condition

No changes to the OMP monitoring network were noted during Q1 2024:

5 Summary and Conclusions

Cardno undertook the Q1 2024 groundwater, porewater, surface water and sediment monitoring event at HMAS Stirling as part of the PFAS OMP. Sampling and testing was undertaken at 60 groundwater monitoring wells, 28 surface water locations and 39 co-located sediment and porewater sampling locations.

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

The groundwater laboratory results reported the following:

- Of the 60 samples that were tested, PFOA (8 samples), PFOS (36 samples) and Sum of PFOS and PFHxS (37 samples) reported concentrations that exceeded adopted assessment criteria.
- No first-time detection of Sum of PFOS and PFHxS or PFOA above the LOR were reported for the groundwater monitoring locations in Q1 2024.
- A new exceedance of the PFOS LOR, adopted as a screening level for ecological protection, was recorded at MW215 located at the HSF (0.01ug/L recorded)..

The surface water laboratory results reported the following:

- Of the 28 samples tested, PFOS (10 samples) and Sum of PFOS and PFHxS (4 samples) were reported above the adopted assessment criteria.
- A first-time detection of Sum of PFOS and PFHxS above the LOR was recorded at SW156 located at the demolition grounds (0.04 µg/L recorded).
- SW156 reported a new exceedance of the PFOS LOR, adopted as an ecological screening level (0.04 µg/L recorded).

The porewater laboratory results reported the following:

- Of the 39 samples that were tested, PFOS (14 samples) and Sum of PFOS and PFHxS (4 samples) reported concentrations above adopted assessment criteria.
- There was no first-time detection of Sum of PFOS and PFHxS or PFOA, or new exceedance of a guideline value for the porewater locations during Q1 2024.

The sediment laboratory results reported the following:

- No first-time detections were reported for the sediment monitoring locations in Q1 2024.

The following actions should be considered prior to the next OMP sampling event:

- Replacement of the groundwater monitoring wells lost/damaged at the demolition ground (MW137, MW272) and main base area (MW517, MW264, MW518, MW010, MW261).
- Repair (re-development) of the silted-up monitoring wells MW147, MW166 and MW197.

The next OMP sampling event for HMAS Stirling will be the quarterly monitoring event (Q2 2024), scheduled for May 2024. An Ongoing Monitoring Report will be prepared for the October 2022 – September 2023 monitoring period.

6 References

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6. Department of Water and Environmental Regulation (DWER), 2021, *Assessment and Management of Contaminated Sites*.
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8. Environmental Protection Agency (United States EPA), November 2002, Reference: EPA/240/R-02/004, *Guidance on Environmental Data Verification and Data Validation.*
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10. National Environment Protection Council (NEPC), 1999, *National Environmental Protection (Assessment of Site Contamination) Measure* (as amended), registered May 2013.
11. National Health and Medical Research Council (NHMRC) (2011 – updated 2022) *National Water Quality Management Strategy Australian Drinking Water Guidelines 6*, September 2022.
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Site Specific References

16. Department of Defence, January 2019, *HMAS Stirling Garden Island PFAS Management Area Plan*, Final.
17. Cardno, February 2024, *PFAS Ongoing Monitoring Plan Sampling and Analysis Quality Plan (SAQP) HMAS Stirling*. Rev 13.
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21. Cardno, 22 January 2021, *PFAS OMP 2020 Q3 Quarterly Sampling Event Factual Report*, HMAS Stirling.
22. Cardno, March 2021, *PFAS OMP 2020 Q4 Quarterly Sampling Event Factual Report*, HMAS Stirling.
23. Cardno, June 2021, *PFAS OMP 2021 Q1 Quarterly Sampling Event Factual Report*, HMAS Stirling.
24. Cardno, August 2021, *PFAS OMP 2021 Q2 Quarterly Sampling Event Factual Report*, HMAS Stirling.
25. Cardno, September 2021, *PFAS OMP – 2020 Annual Interpretive Report*, HMAS Stirling.
26. Cardno, November 2021, *PFAS OMP 2021 Q3 Quarterly Sampling Event Factual Report*, HMAS Stirling.
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28. Cardno, now Stantec, October 2022, *draft PFAS OMP 2021 Annual Interpretive Report.*

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30. Cardno, now Stantec, October 2022, *PFAS OMP 2022 Q2 Quarterly Sampling Event Factual Report*, HMAS Stirling.

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32. Cardno, now Stantec, February 2023, *PFAS OMP 2022 Q4 Quarterly Sampling Event Factual Report*, HMAS Stirling.

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APPENDIX

A

FIGURES

Cardno

now

Stantec

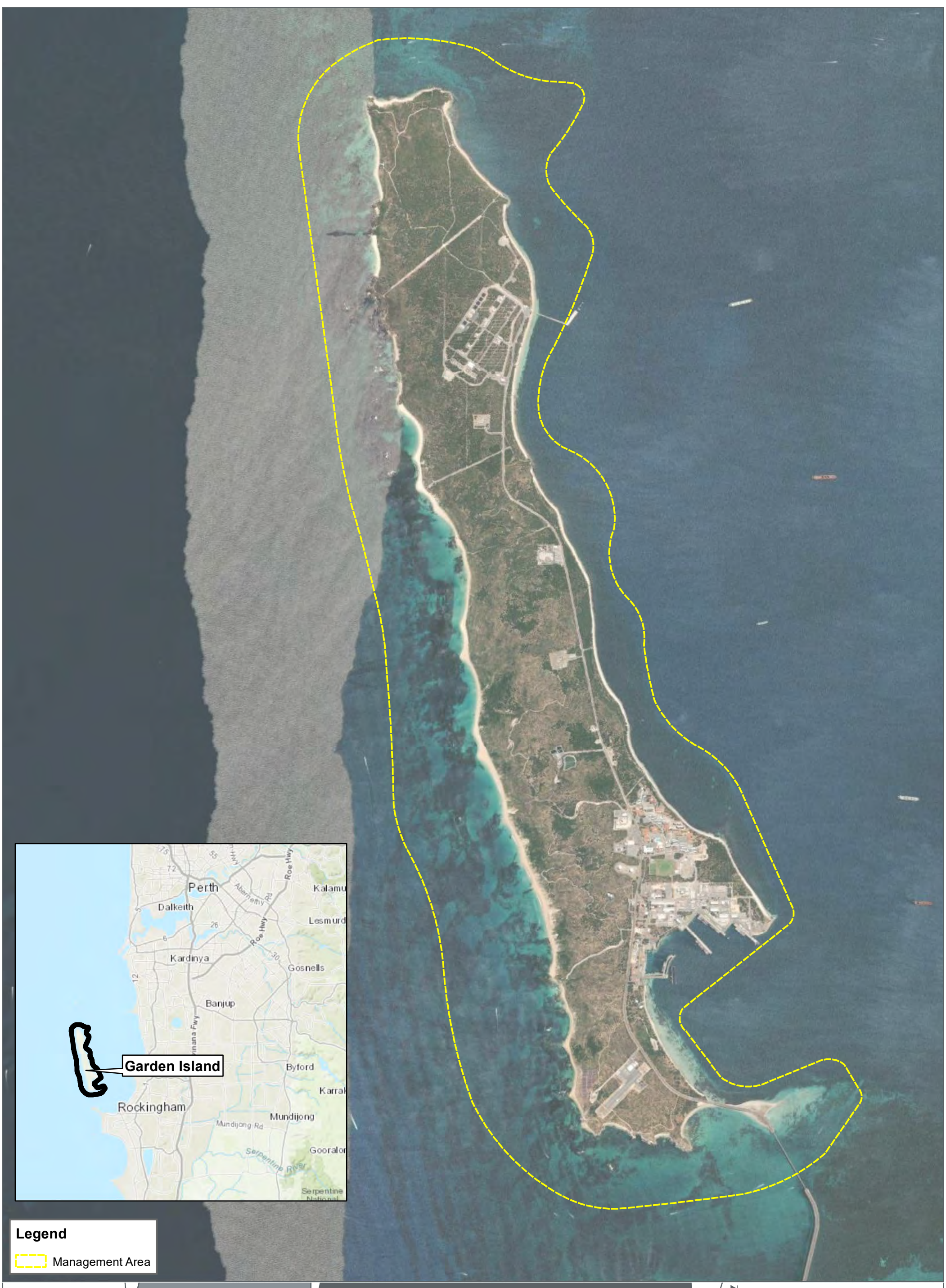

FIGURE 1A

1:32,000 Scale at A3

Metres

0 500 1,000

Site Location

Q1 2024 QUARTERLY SAMPLING EVENT
HMAS STIRLING
DEPARTMENT OF DEFENCE

N

Cardno

Map Produced by Cardno WA
Date: 2024-03-29 | Project: DEF19009
Coordinate System: GDA 1994 MGA Zone 50
Map: DEF19009_WA_0089-GS-001A_RegionalLocation 02.mxd
Aerial Imagery Supplied by Google Map

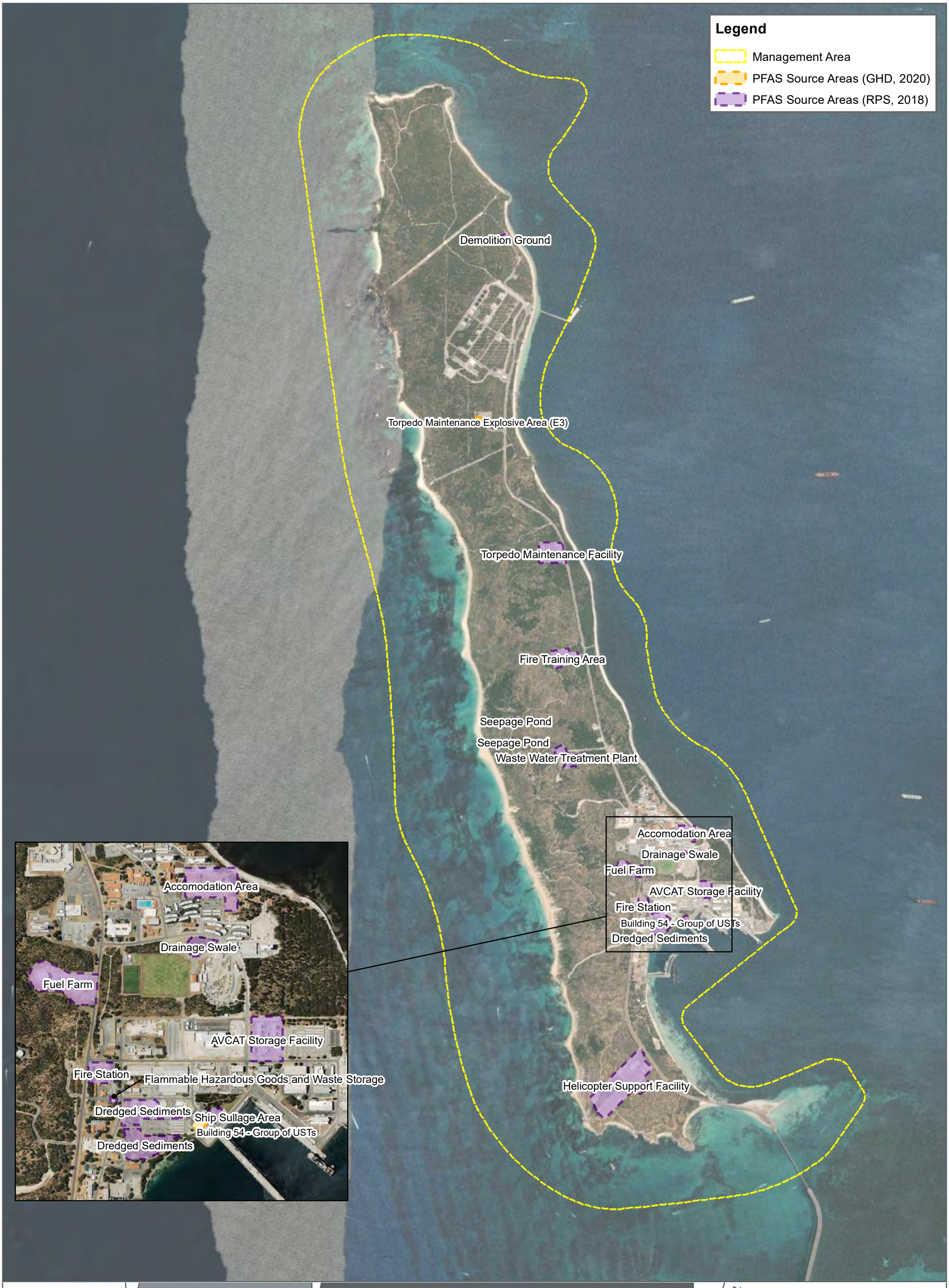

FIGURE 1B

1:32,000 Scale at A3

Metres

0 500 1,000

Management Area

Q1 2024 QUARTERLY SAMPLING EVENT
HMAS STIRLING
DEPARTMENT OF DEFENCE

Cardno

Map Produced by Cardno WA
Date: 2024-03-29 | Project: DEF19009
Coordinate System: GDA 1994 MGA Zone 50
Map: DEF19009_WA_0089-GS-001B_ManagementArea 01.mxd
Aerial Imagery Supplied by Google Earth & Metromap


MW124
MW112
MW128
MW125
MW120
MW123
MW126
MW121
MW127
MW158
MW161
MW166
MW173
MW195S
MW196
MW197
MW171
MW195D
MW199
MW200
MW193
MW203
MW202
MW288
MW289
MW233
MW236
MW238
MW239
MW242
MW243
MW245
MW249
MW255
MW256
MW516
MW496
MW259
MW258
MW269
MW268
MW228
MW217
MW220
MW227
MW214
MW216
MW224
MW226
MW282
MW225
MW215
MW109
MW500
Legend
Management Area
PFAS Source Areas (RPS, 2018)
Groundwater Results Summary
No first-time detection or new exceedance
First-time detection of PFOA or PFOS+PFHxS
New exceedance of a guideline value
Not Sampled
FIGURE 2A
1:12,500 Scale at A3
Metres
0
300
600
Groundwater Results
Q1 2024 QUARTERLY SAMPLING EVENT
HMAS STIRLING
DEPARTMENT OF DEFENCE
N
Cardno
Map Produced by Cardno WA
Date: 2024-03-29 | Project: DEF19009
Coordinate System: GDA 1994 MGA Zone 50
Map: DEF19009_WA_0089-GS-002A_2023Q4_GWResultSummary_PFAS 01.mxd
Aerial Imagery Supplied by Aerometrex



FIGURE 2B

1:15,000 Scale at A3

Metres

0 250 500

Groundwater Results

Q1 2024 QUARTERLY SAMPLING EVENT
HMAS STIRLING
DEPARTMENT OF DEFENCE

N

Cardno

Map Produced by Cardno WA
Date: 2024-03-29 | Project: DEF19009
Coordinate System: GDA 1994 MGA Zone 50
Map: DEF19009_WA_0089-GS-002B_2023Q4_GWResultSummary_PFAS 01.mxd
Aerial Imagery Supplied by Aerometrex

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

Legend

Surface water Results Summary

- No first-time detection or new exceedance
- First-time detection of PFOA or PFOS+PFHxS
- New exceedance of a guideline value
- Management Area
- PFAS Source Areas (RPS, 2018)

FIGURE 3A

1:15,000 Scale at A3

Metres

0 300 600

Surface water Results

Q4 2023 QUARTERLY SAMPLING EVENT
HMAS STIRLING
DEPARTMENT OF DEFENCE

N

Cardno

Map Produced by Cardno WA
Date: 2024-03-29 | Project: DEF19009
Coordinate System: GDA 1994 MGA Zone 50
Map: DEF19009_WA_0089-GS-003A_2023Q4_SWResultSummary_PFAS 01.mxd
Aerial Imagery Supplied by Aerometrex


SW150
SW152
SW154
SW156
SW154
SW156
SW152
Legend
Management Area
PFAS Source Areas (RPS, 2018)
Surface water Results Summary
No first-time detection or new exceedance
First-time detection of PFOA or PFOS+PFHxS
New exceedance of a guideline value
FIGURE 3B
1:15,000 Scale at A3
Metres
0
300
600
Surface water Results
Q1 2024 QUARTERLY SAMPLING EVENT
HMAS STIRLING
DEPARTMENT OF DEFENCE
N
Cardno
Map Produced by Cardno WA
Date: 2024-03-29 | Project: DEF19009
Coordinate System: GDA 1994 MGA Zone 50
Map: DEF19009_WA_0089-GS-003B_2023Q4_SWResultSummary_PFAS 01.mxd
Aerial Imagery Supplied by Google Earth & Nearmap

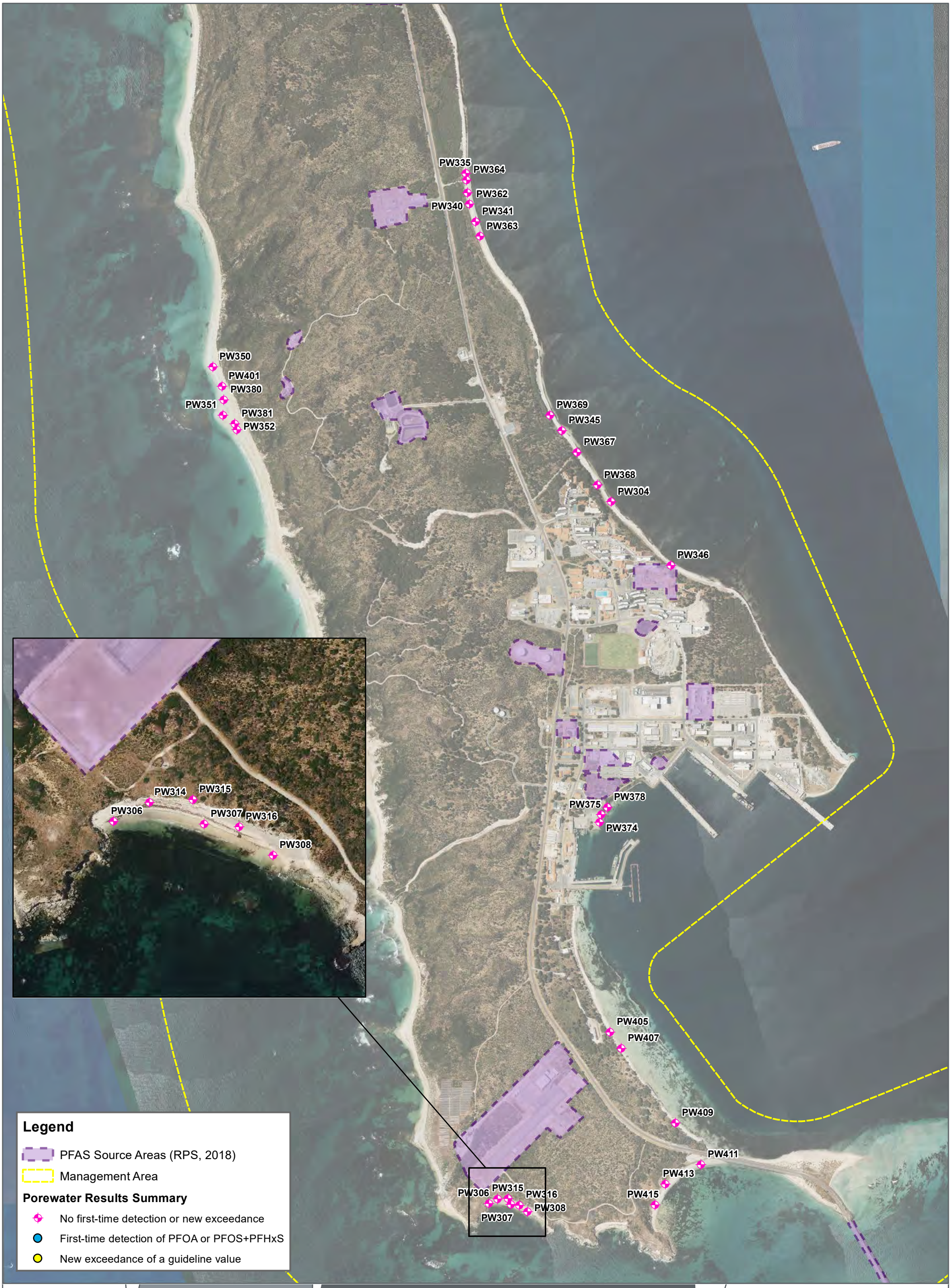

FIGURE 4A

1:15,000 Scale at A3

Metres

0 300 600

Porewater Results

Q1 2024 QUARTERLY SAMPLING EVENT
HMAS STIRLING
DEPARTMENT OF DEFENCE

N

Cardno

Map Produced by Cardno WA
Date: 2024-03-29 | Project: DEF19009
Coordinate System: GDA 1994 MGA Zone 50
Map: DEF19009_WA_0089-GS-004A_2024Q1_PWResultSummary_PFAS 01.mxd
Aerial Imagery Supplied by Google Earth

PW356
PW331
PW357
PW330
PW358
PW329
PW356
PW358
PW357
PW329

Legend

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

Porewater Results Summary

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

FIGURE 4B

1:15,000 Scale at A3

Metres

0 300 600

Porewater Results

Q1 2024 QUARTERLY SAMPLING EVENT
HMAS STIRLING
DEPARTMENT OF DEFENCE

N

Cardno

Map Produced by Cardno WA
Date: 2024-03-29 | Project: DEF19009
Coordinate System: GDA 1994 MGA Zone 50
Map: DEF19009_WA_0089-GS-004B_2024Q1_PWResultSummary_PFAS 01.mxd
Aerial Imagery Supplied by Google Earth & NearMap

SD335
SD364
SD362
SD340
SD341
SD363
SD350
SD401
SD380
SD381
SD351
SD352
SD369
SD345
SD367
SD368
SD304
SD346
SD314
SD315
SD306
SD307
SD316
SD308
SD378
SD375
SD374
SD405
SD407
SD409
SD411
SD413
SD415
SD306
SD315
SD316
SD308
SD307

Legend

Management Area

PFAS Source Areas (RPS, 2018)

Sediment Result Summary

No first-time detection or new exceedance

First-time detection of PFOA or PFOS+PFHxS

FIGURE 5A

1:15,000 Scale at A3

Metres

0 300 600

Sediment Results

Q1 2024 QUARTERLY SAMPLING EVENT
HMAS STIRLING
DEPARTMENT OF DEFENCE

N

Cardno

Map Produced by Cardno WA
Date: 2024-03-29 | Project: DEF19009
Coordinate System: GDA 1994 MGA Zone 50
Map: DEF19009_WA_0089-GS-005A_2024Q1_SDResultSummary_PFAS 01.mxd
Aerial Imagery Supplied by Google Earth



FIGURE 5B

1:15,000 Scale at A3

Metres

0 300 600

Sediment Results

Q1 2024 QUARTERLY SAMPLING EVENT
HMAS STIRLING
DEPARTMENT OF DEFENCE

N

Cardno

Map Produced by Cardno WA
Date: 2024-03-29 | Project: DEF19009
Coordinate System: GDA 1994 MGA Zone 50
Map: DEF19009_WA_0089-GS-005B_2024Q1_SDResultSummary_PFAS 01.mxd
Aerial Imagery Supplied by Google Earth & NearMap



FIGURE 6

1:32,000 Scale at A3

Metres

0 500 1,000

Inferred Groundwater Contours

Q1 2024 QUARTERLY SAMPLING EVENT
HMAS STIRLING
DEPARTMENT OF DEFENCE

N

Cardno

Map Produced by Cardno WA
Date: 2024-03-30 | Project: DEF19009
Coordinate System: GDA 1994 MGA Zone 50
Map: DEF19009_WA_0089-GS-006_2024Q1_GroundwaterContours 01.mxd
Aerial Imagery Supplied by Google Earth & NearMap

APPENDIX

B

DATA ASSESSMENT TABLES

Cardno

now

Stantec

B1 - Water Analyticl Results

						PFAS - Perfluoroalkyl Sulfonic Acids						PFAS - Perfluoroalkyl Carboxylic Acids											PFAS - (n:2) Fluorotelomer Sulfonic Acids					
						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)
						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 - Limit of Reporting						0.01	0.01	0.01	0.01	0.01	0.01	0.05	0.01	0.01	0.02	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.05	0.01	0.01	0.02	0.05
PFAS NEMP 2020 Drinking Water																*0.56*												
PFAS NEMP 2020 Freshwater 99%										0.00023*						19												
PFAS NEMP 2020 Recreational Water																**10**												
Monitoring Area	**Location Code**	**Date**	**Field ID**	**Sample Type**	**Lab Report**																								
		11 Mar 2024	**0089_QC301_240311**	**Rinsate**	**EP2403147**	<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
		11 Mar 2024	**0089_QC302_240311**	**Rinsate**	**EP2403147**	<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
		11 Mar 2024	**0089_QC303_240311**	**Rinsate**	**EP2403149**	<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
		11 Mar 2024	**0089_QC401_240311**	**Field Blank**	**EP2403147**	<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
		11 Mar 2024	**0089_QC402_240311**	**Field Blank**	**EP2403147**	<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
		11 Mar 2024	**0089_QC403_240311**	**Field Blank**	**EP2403149**	<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
		12 Mar 2024	**0089_QC301_240312**	**Rinsate**	**EP2403216**	<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
		12 Mar 2024	**0089_QC302_240312**	**Rinsate**	**EP2403216**	<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
		12 Mar 2024	**0089_QC303_240312**	**Rinsate**	**EP2403216**	<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
		12 Mar 2024	**0089_QC401_240312**	**Field Blank**	**EP2403216**	<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
		12 Mar 2024	**0089_QC402_240312**	**Field Blank**	**EP2403216**	<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
		12 Mar 2024	**0089_QC403_240312**	**Field Blank**	**EP2403216**	<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
		13 Mar 2024	**0089_QC301_240313**	**Rinsate**	**EP2403299**	<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
		13 Mar 2024	**0089_QC302_240313**	**Rinsate**	**EP2403299**	<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
		13 Mar 2024	**0089_QC401_240313**	**Field Blank**	**EP2403299**	<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
		13 Mar 2024	**0089_QC402_240313**	**Field Blank**	**EP2403299**	<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
FTA	**MW109**	**11 Mar 2024**	**0089_MW109_240311**	**Normal**	**EP2403138**	0.10	0.13	0.56	<0.02	0.09	<0.02	<0.1	<0.02	0.08	<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
FTA	**MW112**	**11 Mar 2024**	**0089_MW112_240311**	**Normal**	**EP2403138**	0.08	0.20	3.88	0.33	26.6	<0.02	0.2	0.32	1.11	0.46	*1.30*	0.03	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	0.18	<0.05	<0.05	0.54	<0.05
FTA	**MW120**	**11 Mar 2024**	**0089_MW120_240311**	**Normal**	**EP2403138**	<0.02	0.03	1.31	0.18	1.44	<0.02	<0.1	<0.02	0.07	<0.02	0.07	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05
FTA	**MW121**	**11 Mar 2024**	**0089_MW121_240311**	**Normal**	**EP2403138**	0.05	0.14	5.87	0.55	4.62	<0.02	<0.1	0.15	0.40	0.14	0.44	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05
FTA	**MW123**	**11 Mar 2024**	**0089_MW123_240311**	**Normal**	**EP2403138**	0.26	0.90	14.0	1.11	20.5	<0.02	0.1	0.28	1.68	0.25	*0.90*	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	0.13	<0.05	<0.05	0.14	<0.05
FTA	**MW123**	**11 Mar 2024**	**0089_QC109_240311**	**Field Duplicate**	**EP2403138**	0.25	0.97	15.8	1.18	21.8	<0.02	0.1	0.29	1.67	0.25	*0.99*	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	0.13	<0.05	<0.05	0.14	<0.05
FTA	**MW123**	**11 Mar 2024**	**0089_QC209_240311**	**Interlab Duplicate**	**1078840**	0.27	0.93	15	0.90	19	<0.01	0.09	0.27	1.5	0.27	*1.0*	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.13	0.02	<0.01	0.13	<0.05
FTA	**MW124**	**11 Mar 2024**	**0089_MW124_240311**	**Normal**	**EP2403138**	0.03	<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
FTA	**MW125**	**11 Mar 2024**	**0089_MW125_240311**	**Normal**	**EP2403138**	0.13	0.17	0.43	<0.02	<0.01	<0.02	<0.1	0.02	0.12	<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
FTA	**MW126**	**11 Mar 2024**	**0089_MW126_240311**	**Normal**	**EP2403138**	<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
FTA	**MW127**	**11 Mar 2024**	**0089_MW127_240311**	**Normal**	**EP2403138**	<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
FTA	**MW128**	**12 Mar 2024**	**0089_MW128_240312**	**Normal**	**EP2403216**	<0.02	<0.02	0.06	<0.02	1.08	<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
Demolition Ground	**MW139**	**11 Mar 2024**	**0089_MW139_240311**	**Normal**	**EP2403149**	<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
Demolition Ground	**MW139**	**11 Mar 2024**	**0089_QC105_240311**	**Field Duplicate**	**EP2403149**	<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
Demolition Ground	**MW139**	**11 Mar 2024**	**0089_QC205_240311**	**Interlab Duplicate**	**1078840**	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.05	<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
Demolition Ground	**MW141**	**11 Mar 2024**	**0089_MW141_240311**	**Normal**	**EP2403149**	0.49	0.94	16.2	0.55	48.0	<0.02	0.3	1.26	13.4	0.35	*1.07*	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05
Demolition Ground	**MW142**	**11 Mar 2024**	**0089_MW142_240311**	**Normal**	**EP2403149**	0.22	0.27	3.85	0.07	2.33	<0.02	0.1	0.41	4.06	0.09	0.24	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05
Demolition Ground	**MW147**	**11 Mar 2024**	**0089_MW147_240311**	**Normal**	**EP2403149**	<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
Demolition Ground	**MW149**	**11 Mar 2024**	**0089_MW149_240311**	**Normal**	**EP2403149**	<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
WWTP	**MW158**	**12 Mar 2024**	**0089_MW158_240312**	**Normal**	**EP2403226**	<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
WWTP	**MW161**	**12 Mar 2024**	**0089_MW161_240312**	**Normal**	**EP2403226**	<0.02	0.02	0.21	0.03	2.74	<0.02	<0.1	0.04	0.05	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
WWTP	**MW166**	**12 Mar 2024**	**0089_MW166_240312**	**Normal**	**EP2403226**	0.07	0.02	0.47	0.07	4.89	<0.02	0.1	0.31	0.30	0.12	0.09	0.04	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	0.07	<0.05	<0.05	<0.02	<0.05
WWTP	**MW171**	**12 Mar 2024**	**0089_MW171_240312**	**Normal**	**EP2403226**	0.50	0.29	1.26	0.04	0.03	<0.02	0.2	0.21	0.74	0.04	0.04	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05
WWTP	**MW173**	**13 Mar 2024**	**0089_MW173_240313**	**Normal**	**EP2403299**	0.12	0.07	1.38	0.23	2.70	<0.02	<0.1	0.06	0.22	0.04	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
WWTP	**MW193**	**12 Mar 2024**	**0089_MW193_240312**	**Normal**	**EP2403216**	0.78	1.45	11.5	0.84	3.50	<0.02	0.3	0.34	1.62	0.26	*0.85*	0.04	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05
WWTP	**MW195D**	**12 Mar 2024**	**0089_MW195D_240312**	**Normal**	**EP2403216**	<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
WWTP	**MW195S**	**12 Mar 2024**	**0089_MW195S_240312**	**Normal**	**EP2403216**	<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
WWTP	**MW196**	**12 Mar 2024**	**0089_MW196_240312**	**Normal**	**EP2403226**	<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
WWTP	**MW199**	**12 Mar 2024**	**0089_MW199_240312**	**Normal**	**EP2403216**	<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
WWTP	**MW200**	**13 Mar 2024**	**0089_MW200_240313**	**Normal**	**EP2403299**	<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
WWTP	**MW202**	**12 Mar 2024**	**0089_MW202_240312**	**Normal**	**EP2403216**	<0.02	<0.02	0.01	<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
WWTP	**MW203**	**13 Mar 2024**	**0089_MW203_240313**	**Normal**	**EP2403299**	<0.02	0.02	0.10	<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
HSF	**MW214**	**11 Mar 2024**	**0089_MW214_240311**	**Normal**	**EP2403152**	<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
HSF	**MW215**	**11 Mar 2024**	**0089_MW215_240311**	**Normal**	**EP2403152**	0.04	0.07	0.49	<0.02	0.01	<0.02	<0.1	0.04	0.14	0.03	<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
HSF	**MW216**	**12 Mar 2024**	**0089_MW216_240312**	**Normal**	**EP2403226**	0.12	0.10	0.81	0.03	0.12	<0.02	3.5	10.7	7.81	1.35	0.10	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	1.73	<0.05	<0.05	<0.02	<0.05
HSF	**MW217**	**13 Mar 2024**	**0089_MW217_240313**	**Normal**	**EP2403298**	<0.02	<0.02	0.02	<0.02	0.06	<0.02	1.3	5.32	4.55	1.06	0.30	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	27.2	0.33	<0.05	<0.02	<0.05
HSF	**MW220**	**13 Mar 2024**	**0089_MW220_240313**	**Normal**	**EP2403298**	0.05	0.02	0.18	0.02	3.69	<0.02	<0.1	0.10	0.11	0.05	0.04	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05
HSF	**MW224**	**13 Mar 2024**	**0089_MW224_240313**	**Normal**	**EP2403298**	<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
HSF	**MW225**	**12 Mar 2024**	**0089_MW225_240312**	**Normal**	**EP2403226**	<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
HSF	**MW225**	**12 Mar 2024**	**0089_QC118_240312**	**Field Duplicate**	**EP2403226**	<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
HSF	**MW225**	**12 Mar 2024**	**0089_QC218_240312**	**Interlab Duplicate**	**1078840**	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.05	<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
HSF	**MW226**	**12 Mar 2024**	**0089_MW226_240312**	**Normal**	**EP2403226**	<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
HSF	**MW227**	**12 Mar 2024**	**0089_MW227_240312**	**Normal**	**EP2403226**	<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
HSF	**MW228**	**12 Mar 2024**	**0089_MW228_240312**	**Normal**	**EP2403226**	0.33	0.24	0.67	<0.02	<0.01	<0.02	1.7	7.36	6.37	1.47	0.34	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	0.81	<0.05	<0.05	<0.02	<0.05
HSF	**MW228**	**12 Mar 2024**	**0089_QC113_240312**	**Field Duplicate**	**EP2403226**	0.33	0.24	0.66	<0.02	<0.01	<0.02	1.6	5.88	6.11	1.44	0.35	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	0.82	<0.05	<0.05	<0.02	<0.05
HSF	**MW228**	**12 Mar 2024**	**0089_QC213_240312**	**Interlab Duplicate**	**1078840**	0.38	0.46	1.1	<0.01	<0.01	<0.01	1.1	5.0	5.5	1.4	0.51	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.91	<0.01	<0.01	<0.01	<0.05
AVCAT Storage and Fuel Fa	**MW233**	**12 Mar 2024**	**0089_MW233_240312**	**Normal**	**EP2403218**	<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
AVCAT Storage and Fuel Fa	**MW236**	**12 Mar 2024**	**0089_MW236_240312**	**Normal**	**EP2403218**	0.24	0.24	11.6	0.41	66.7	<0.02	<0.1	0.14	0.64	0.18	*1.29*	2.69	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05
AVCAT Storage and Fuel Fa	**MW238**	**12 Mar 2024**	**0089_MW238_240312**	**Normal**	**EP2403218**	<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
AVCAT Storage and Fuel Fa	**MW239**	**12 Mar 2024**	**0089_MW239_240312**	**Normal**	**EP2403218**	<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
AVCAT Storage and Fuel Fa	**MW240**	**12 Mar 2024**	**0089_MW240_240312**	**Normal**	**EP2403218**	<0.02	0.06	1.72	0.04	<0.01	<0.02	<0.1	<0.02	0.07	0.02	0.06	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05
AVCAT Storage and Fuel Fa	**MW240**	**12 Mar 2024**	**0089_QC116_240312**	**Field Duplicate**	**EP2403218**	<0.02	0.06	1.80	0.04	<0.01	<0.02	<0.1	<0.02	0.07	0.02	0.07	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05
AVCAT Storage and Fuel Fa	**MW240**	**12 Mar 2024**	**0089_QC216_240312**	**Interlab Duplicate**	**1078840**	<0.01	<0.01	0.22	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.05	<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
AVCAT Storage and Fuel Fa	**MW242**	**12 Mar 2024**	**0089_MW242_240312**	**Normal**	**EP2403218**	<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
AVCAT Storage and Fuel Fa	**MW242**	**12 Mar 2024**	**0089_QC117_240312**	**Field Duplicate**	**EP2403218**	<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
AVCAT Storage and Fuel Fa	**MW242**	**12 Mar 2024**	**0089_QC217_240312**	**Interlab Duplicate**	**1078840**	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.05	<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
AVCAT Storage and Fuel Fa	**MW243**	**12 Mar 2024**	**0089_MW243_240312**	**Normal**	**EP2403218**	<0.02	<0.02	0.07	<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
AVCAT Storage and Fuel Fa	**MW245**	**12 Mar 2024**	**0089_MW245_240312**	**Normal**	**EP2403218**	<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
AVCAT Storage and Fuel Fa	**MW249**	**13 Mar 2024**	**0089_MW249_240313**	**Normal**	**EP2403298**	<0.02	<0.02	0.26	<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
Fire Station, Flammable/Hazardous Goods and Waste Storage, Ship Sullage	**MW255**	**12 Mar 2024**	**0089_MW255_240312**	**Normal**	**EP2403218**	0.49	0.50	13.1	0.02	0.41	<0.02	0.2	0.25	1.00	0.21	0.06	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05
	MW256	**12 Mar 2024**	**0089_MW256_240312**	**Normal**	**EP2403218**	4.81	4.99	24.0	0.40	7.09	<0.02	1.4	2.71	10.3	0.92	*0.97*	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	0.72	<0.05	<0.05	0.04	<0.05

B1 - Water Analyticl Results

						PFAS - Perfluoroalkyl Sulfonic Acids						**PFAS - Perfluoroalkyl Carboxylic Acids**											**PFAS - (n:2) Fluorotelomer Sulfonic Acids**					
						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)**
						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 - Limit of Reporting						0.01	0.01	0.01	0.01	0.01	0.01	0.05	0.01	0.01	0.02	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.05	0.01	0.01	0.02	0.05
PFAS NEMP 2020 Drinking Water																*0.56*											
PFAS NEMP 2020 Freshwater 99%										0.00023*						19											
PFAS NEMP 2020 Recreational Water																**10**											
Monitoring Area	**Location Code**	**Date**	**Field ID**	**Sample Type**	**Lab Report**																						
WWTP (East)	**PW304**	**12 Mar 2024**	**0089_PW304_240312**	**Normal**	**EP2403250**	<0.02	<0.02	<0.01	<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
WWTP (East)	**PW304**	**12 Mar 2024**	**0089_QC111_240312**	**Field Duplicate**	**EP2403250**	<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
WWTP (East)	**PW304**	**12 Mar 2024**	**0089_QC211_240312**	**Interlab Duplicate**	**1078840**	<0.01	<0.01	0.03	<0.01	0.09	<0.01	<0.05	0.02	0.03	<0.05	<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
HSF	**PW306**	**11 Mar 2024**	**0089_PW306_240311**	**Normal**	**EP2403147**	<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
HSF	**PW307**	**11 Mar 2024**	**0089_PW307_240311**	**Normal**	**EP2403147**	<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
HSF	**PW308**	**11 Mar 2024**	**0089_PW308_240311**	**Normal**	**EP2403147**	<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
HSF	**PW314**	**11 Mar 2024**	**0089_PW314_240311**	**Normal**	**EP2403147**	<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
HSF	**PW315**	**11 Mar 2024**	**0089_PW315_240311**	**Normal**	**EP2403147**	<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
HSF	**PW315**	**11 Mar 2024**	**0089_QC103_240311**	**Field Duplicate**	**EP2403147**	<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
HSF	**PW315**	**11 Mar 2024**	**0089_QC203_240311**	**Interlab Duplicate**	**1078840**	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	0.02	0.02	<0.05	<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
HSF	**PW316**	**11 Mar 2024**	**0089_PW316_240311**	**Normal**	**EP2403147**	<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
Demolition Ground	**PW329**	**11 Mar 2024**	**0089_PW329_240311**	**Normal**	**EP2403151**	<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
Demolition Ground	**PW330**	**11 Mar 2024**	**0089_PW330_240311**	**Normal**	**EP2403151**	<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
Demolition Ground	**PW331**	**11 Mar 2024**	**0089_PW331_240311**	**Normal**	**EP2403151**	<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
FTA	**PW335**	**11 Mar 2024**	**0089_PW335_240311**	**Normal**	**EP2403140**	<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
FTA	**PW335**	**11 Mar 2024**	**0089_QC104_240311**	**Field Duplicate**	**EP2403140**	<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
FTA	**PW335**	**11 Mar 2024**	**0089_QC204_240311**	**Interlab Duplicate**	**1078840**	<0.01	<0.01	<0.01	<0.01	0.03	<0.01	<0.05	0.04	0.04	<0.05	<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
FTA	**PW340**	**11 Mar 2024**	**0089_PW340_240311**	**Normal**	**EP2403140**	<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
FTA	**PW341**	**11 Mar 2024**	**0089_PW341_240311**	**Normal**	**EP2403140**	<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
WWTP (East)	**PW345**	**13 Mar 2024**	**0089_PW345_240313**	**Normal**	**EP2403297**	<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
Accomodation Area	**PW346**	**12 Mar 2024**	**0089_PW346_240312**	**Normal**	**EP2403219**	<0.02	<0.02	0.01	<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
WWTP (West)	**PW350**	**11 Mar 2024**	**0089_PW350_240311**	**Normal**	**EP2403147**	<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
WWTP (West)	**PW351**	**11 Mar 2024**	**0089_PW351_240311**	**Normal**	**EP2403147**	<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
WWTP (West)	**PW352**	**11 Mar 2024**	**0089_PW352_240311**	**Normal**	**EP2403147**	<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
Demolition Ground	**PW356**	**11 Mar 2024**	**0089_PW356_240311**	**Normal**	**EP2403151**	<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
Demolition Ground	**PW357**	**11 Mar 2024**	**0089_PW357_240311**	**Normal**	**EP2403151**	<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
Demolition Ground	**PW358**	**11 Mar 2024**	**0089_PW358_240311**	**Normal**	**EP2403151**	<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
FTA	**PW362**	**11 Mar 2024**	**0089_PW362_240311**	**Normal**	**EP2403140**	<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
FTA	**PW363**	**11 Mar 2024**	**0089_PW363_240311**	**Normal**	**EP2403140**	<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
FTA	**PW364**	**11 Mar 2024**	**0089_PW364_240311**	**Normal**	**EP2403140**	<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
WWTP (East)	**PW367**	**13 Mar 2024**	**0089_PW367_240313**	**Normal**	**EP2403297**	<0.02	<0.02	0.02	<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
WWTP (East)	**PW368**	**12 Mar 2024**	**0089_PW368_240312**	**Normal**	**EP2403250**	<0.02	<0.02	<0.01	<0.02	0.10	<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
WWTP (East)	**PW369**	**13 Mar 2024**	**0089_PW369_240313**	**Normal**	**EP2403297**	<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
Dredge Spoil / Careening B	**PW374**	**11 Mar 2024**	**0089_PW374_240311**	**Normal**	**EP2403147**	<0.02	<0.02	<0.01	<0.02	0.02	<0.02	<0.1	0.15	0.15	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	0.11	<0.05	<0.05	<0.02	<0.05
Dredge Spoil / Careening B	**PW375**	**11 Mar 2024**	**0089_PW375_240311**	**Normal**	**EP2403147**	<0.02	<0.02	<0.01	<0.02	0.01	<0.02	<0.1	0.14	0.08	<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
Dredge Spoil / Careening B	**PW378**	**11 Mar 2024**	**0089_PW378_240311**	**Normal**	**EP2403147**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	0.17	0.08	<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
WWTP (West)	**PW380**	**11 Mar 2024**	**0089_PW380_240311**	**Normal**	**EP2403147**	<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
WWTP (West)	**PW381**	**11 Mar 2024**	**0089_PW381_240311**	**Normal**	**EP2403147**	<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
WWTP (West)	**PW401**	**11 Mar 2024**	**0089_PW401_240311**	**Normal**	**EP2403147**	<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
HSF	**PW405**	**12 Mar 2024**	**0089_PW405_240312**	**Normal**	**EP2403224**	<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
HSF	**PW405**	**12 Mar 2024**	**0089_QC114_240312**	**Field Duplicate**	**EP2403224**	<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
HSF	**PW405**	**12 Mar 2024**	**0089_QC214_240312**	**Interlab Duplicate**	**1078840**	<0.01	<0.01	0.02	<0.01	0.01	<0.01	<0.05	0.04	0.08	<0.05	<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
HSF	**PW407**	**12 Mar 2024**	**0089_PW407_240312**	**Normal**	**EP2403224**	<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
HSF	**PW409**	**12 Mar 2024**	**0089_PW409_240312**	**Normal**	**EP2403224**	<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
HSF	**PW411**	**12 Mar 2024**	**0089_PW411_240312**	**Normal**	**EP2403224**	<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
HSF	**PW413**	**12 Mar 2024**	**0089_PW413_240312**	**Normal**	**EP2403224**	<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
HSF	**PW415**	**12 Mar 2024**	**0089_PW415_240312**	**Normal**	**EP2403224**	<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
FTA	**SW130**	**11 Mar 2024**	**0089_SW130_240311**	**Normal**	**EP2403140**	<0.02	<0.02	<0.01	<0.02	0.01	<0.02	<0.1	<0.02	<0.02	0.03	<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
FTA	**SW132**	**11 Mar 2024**	**0089_SW132_240311**	**Normal**	**EP2403140**	<0.02	<0.02	<0.01	<0.02	0.01	<0.02	<0.1	<0.02	<0.02	0.04	<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
FTA	**SW134**	**11 Mar 2024**	**0089_SW134_240311**	**Normal**	**EP2403140**	<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
Demolition Ground	**SW150**	**11 Mar 2024**	**0089_QC107_240311**	**Field Duplicate**	**EP2403151**	<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
Demolition Ground	**SW150**	**11 Mar 2024**	**0089_QC207_240311**	**Interlab Duplicate**	**1078840**	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.05	<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
Demolition Ground	**SW150**	**11 Mar 2024**	**0089_SW150_240311**	**Normal**	**EP2403151**	<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
Demolition Ground	**SW152**	**11 Mar 2024**	**0089_SW152_240311**	**Normal**	**EP2403151**	<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
Demolition Ground	**SW154**	**11 Mar 2024**	**0089_SW154_240311**	**Normal**	**EP2403151**	<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
Demolition Ground	**SW156**	**11 Mar 2024**	**0089_SW156_240311**	**Normal**	**EP2403151**	<0.02	<0.02	<0.01	<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
WWTP (East)	**SW305**	**12 Mar 2024**	**0089_QC112_240312**	**Field Duplicate**	**EP2403250**	<0.02	<0.02	0.03	<0.02	0.16	<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
WWTP (East)	**SW305**	**12 Mar 2024**	**0089_QC212_240312**	**Interlab Duplicate**	**1078840**	<0.01	<0.01	0.05	<0.01	0.46	<0.01	<0.05	0.03	0.04	<0.05	<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
WWTP (East)	**SW305**	**12 Mar 2024**	**0089_SW305_240312**	**Normal**	**EP2403250**	<0.02	<0.02	0.04	<0.02	0.75	<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
HSF	**SW309**	**11 Mar 2024**	**0089_QC102_240311**	**Field Duplicate**	**EP2403147**	<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
HSF	**SW309**	**11 Mar 2024**	**0089_QC202_240311**	**Interlab Duplicate**	**1078840**	<0.01	<0.01	<0.01	<0.01	0.02	<0.01	<0.05	0.03	0.04	<0.05	<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
HSF	**SW309**	**11 Mar 2024**	**0089_SW309_240311**	**Normal**	**EP2403147**	<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
HSF	**SW310**	**11 Mar 2024**	**0089_SW310_240311**	**Normal**	**EP2403147**	<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
HSF	**SW311**	**11 Mar 2024**	**0089_SW311_240311**	**Normal**	**EP2403147**	<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
Dredge Spoil / Careening B	**SW317**	**11 Mar 2024**	**0089_SW317_240311**	**Normal**	**EP2403147**	<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
Dredge Spoil / Careening B	**SW318**	**11 Mar 2024**	**0089_SW318_240311**	**Normal**	**EP2403147**	<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
Dredge Spoil / Careening B	**SW319**	**11 Mar 2024**	**0089_SW319_240311**	**Normal**	**EP2403147**	<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
WWTP (West)	**SW353**	**11 Mar 2024**	**0089_SW353_240311**	**Normal**	**EP2403147**	<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
WWTP (East)	**SW370**	**13 Mar 2024**	**0089_SW370_240313**	**Normal**	**EP2403297**	<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
WWTP (East)	**SW371**	**12 Mar 2024**	**0089_SW371_240312**	**Normal**	**EP2403250**	<0.02	<0.02	0.02	<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
WWTP (East)	**SW372**	**12 Mar 2024**	**0089_SW372_240312**	**Normal**	**EP2403219**	<0.02	<0.02	0.03	<0.02	0.18	<0.02	<0.1	<0.02	<0.02	<0.04	<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
WWTP (West)	**SW373**	**12 Mar 2024**	**0089_SW373_240312**	**Normal**	**EP2403219**	<0.02	<0.02	<0.01	<0.02	0.17	<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
WWTP (West)	**SW382**	**11 Mar 2024**	**0089_SW382_240311**	**Normal**	**EP2403147**	<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
WWTP (West)	**SW383**	**11 Mar 2024**	**0089_SW383_240311**	**Normal**	**EP2403147**	<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
WWTP (West)	**SW384**	**11 Mar 2024**	**0089_SW384_240311**	**Normal**	**EP2403147**	<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
HSF	**SW406**	**12 Mar 2024**	**0089_SW406_240312**	**Normal**	**EP2403224**	<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
HSF	**SW408**	**12 Mar 2024**

						PFAS - Perfluoroalkyl Sulfonamides					PFAS			Inorganics									Metals			
						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 (WA DER List)	Sum of PFAS	Carbonate Alkalinity (as CaCO3)	Alkalinity (Bicarbonate as CaCO3)	Alkalinity (Hydroxide) as CaCO3	Alkalinity (total) as CaCO3	Anions Total	Cations Total	Chloride	Ionic Balance	Sulphate as SO4 - Turbidimetric (filtered)	Calcium (filtered)	Magnesium (filtered)	Potassium (filtered)	Sodium (filtered)
						µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	mg/L	mg/L	mg/L	mg/L	meq/L	meq/L	mg/L	%	mg/L	mg/L	mg/L	mg/L	mg/L
LOR - Limit of Reporting						0.02	0.05	0.05	0.02	0.05	0.01	0.01	0.01	1	1	1	1	0.01	0.01	1	0.01	1	1	1	1	1
PFAS NEMP 2020 Drinking Water											*0.07*															
PFAS NEMP 2020 Freshwater 99%																										
PFAS NEMP 2020 Recreational Water											**2**															
Monitoring Area	**Location Code**	**Date**	**Field ID**	**Sample Type**	**Lab Report**																					
		11 Mar 2024	**0089_QC301_240311**	**Rinsate**	**EP2403147**	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01													
		11 Mar 2024	**0089_QC302_240311**	**Rinsate**	**EP2403147**	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01													
		11 Mar 2024	**0089_QC303_240311**	**Rinsate**	**EP2403149**	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01													
		11 Mar 2024	**0089_QC401_240311**	**Field Blank**	**EP2403147**	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01													
		11 Mar 2024	**0089_QC402_240311**	**Field Blank**	**EP2403147**	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01													
		11 Mar 2024	**0089_QC403_240311**	**Field Blank**	**EP2403149**	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01													
		12 Mar 2024	**0089_QC301_240312**	**Rinsate**	**EP2403216**	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01													
		12 Mar 2024	**0089_QC302_240312**	**Rinsate**	**EP2403216**	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01													
		12 Mar 2024	**0089_QC303_240312**	**Rinsate**	**EP2403216**	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01													
		12 Mar 2024	**0089_QC401_240312**	**Field Blank**	**EP2403216**	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01													
		12 Mar 2024	**0089_QC402_240312**	**Field Blank**	**EP2403216**	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01													
		12 Mar 2024	**0089_QC403_240312**	**Field Blank**	**EP2403216**	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01													
		13 Mar 2024	**0089_QC301_240313**	**Rinsate**	**EP2403299**	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01													
		13 Mar 2024	**0089_QC302_240313**	**Rinsate**	**EP2403299**	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01													
		13 Mar 2024	**0089_QC401_240313**	**Field Blank**	**EP2403299**	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01													
		13 Mar 2024	**0089_QC402_240313**	**Field Blank**	**EP2403299**	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01													
FTA	**MW109**	**11 Mar 2024**	**0089_MW109_240311**	**Normal**	**EP2403138**	<0.02	<0.05	<0.05	<0.02	<0.05	*0.65*	0.83	0.96	<1	425	<1	425	15.2	14.2	212	3.65	36	110	36	<1	131
FTA	**MW112**	**11 Mar 2024**	**0089_MW112_240311**	**Normal**	**EP2403138**	<0.02	<0.05	<0.05	<0.02	<0.05	***30.5***	34.1	35.2	<1	236	<1	236	5.69	5.90	30	1.81	6	85	9	<1	21
FTA	**MW120**	**11 Mar 2024**	**0089_MW120_240311**	**Normal**	**EP2403138**	<0.02	<0.05	<0.05	<0.02	<0.05	***2.75***	2.89	3.10	<1	256	<1	256	7.13	7.08	59	0.38	17	81	18	3	34
FTA	**MW121**	**11 Mar 2024**	**0089_MW121_240311**	**Normal**	**EP2403138**	<0.02	<0.05	<0.05	<0.02	<0.05	***10.5***	11.7	12.4	<1	369	<1	369	9.37	7.85	56	8.82	20	98	16	3	36
FTA	**MW123**	**11 Mar 2024**	**0089_MW123_240311**	**Normal**	**EP2403138**	<0.02	<0.05	<0.05	<0.02	<0.05	***34.5***	38.1	40.2	<1	266	<1	266	7.25	7.96	51	4.65	24	98	18	6	33
FTA	**MW123**	**11 Mar 2024**	**0089_QC109_240311**	**Field Duplicate**	**EP2403138**	<0.02	<0.05	<0.05	<0.02	<0.05	***37.6***	41.3	43.6	<1	276	<1	276	7.57	7.73	53	1.07	27	96	17	6	32
FTA	**MW123**	**11 Mar 2024**	**0089_QC209_240311**	**Interlab Duplicate**	**1078840**	<0.05	<0.05	<0.05	<0.05	<0.05	***34***	37.55	39.63													
FTA	**MW124**	**11 Mar 2024**	**0089_MW124_240311**	**Normal**	**EP2403138**	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	0.03	0.03	<1	399	<1	399	466	516	14,800	5.11	1,960	475	1,200	473	8,780
FTA	**MW125**	**11 Mar 2024**	**0089_MW125_240311**	**Normal**	**EP2403138**	<0.02	<0.05	<0.05	<0.02	<0.05	*0.43*	0.70	0.87	<1	415	<1	415	479	540	15,200	5.91	2,030	476	1,240	512	9,210
FTA	**MW126**	**11 Mar 2024**	**0089_MW126_240311**	**Normal**	**EP2403138**	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	636	<1	636	385	445	12,100	7.13	1,510	359	1,100	390	7,500
FTA	**MW127**	**11 Mar 2024**	**0089_MW127_240311**	**Normal**	**EP2403138**	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	618	<1	618	437	479	13,900	4.51	1,580	350	1,170	422	8,140
FTA	**MW128**	**12 Mar 2024**	**0089_MW128_240312**	**Normal**	**EP2403216**	<0.02	<0.05	<0.05	<0.02	<0.05	*1.14*	1.17	1.17	<1	374	<1	374	10.9	11.1	105	0.94	21	122	28	3	60
Demolition Ground	**MW139**	**11 Mar 2024**	**0089_MW139_240311**	**Normal**	**EP2403149**	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	216	<1	216	36.3	36.1	1,060	0.36	101	121	78	30	525
Demolition Ground	**MW139**	**11 Mar 2024**	**0089_QC105_240311**	**Field Duplicate**	**EP2403149**	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	218	<1	218	38.4	37.8	1,130	0.91	107	124	82	32	552
Demolition Ground	**MW139**	**11 Mar 2024**	**0089_QC205_240311**	**Interlab Duplicate**	**1078840**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.01	<0.05	<0.1													
Demolition Ground	**MW141**	**11 Mar 2024**	**0089_MW141_240311**	**Normal**	**EP2403149**	<0.02	<0.05	<0.05	<0.02	<0.05	***64.2***	81.1	82.6	<1	572	<1	572	313	280	9,980	5.65	985	421	689	236	4,510
Demolition Ground	**MW142**	**11 Mar 2024**	**0089_MW142_240311**	**Normal**	**EP2403149**	<0.02	<0.05	<0.05	<0.02	<0.05	***6.18***	11.3	11.6	<1	465	<1	465	359	357	11,400	0.28	1,340	433	860	354	5,870
Demolition Ground	**MW147**	**11 Mar 2024**	**0089_MW147_240311**	**Normal**	**EP2403149**	<0.02	<0.05	<0.05	<0.02	<0.05	0.03	0.03	0.03	<1	466	<1	466	319	309	10,100	1.59	1,200	339	756	304	5,110
Demolition Ground	**MW149**	**11 Mar 2024**	**0089_MW149_240311**	**Normal**	**EP2403149**	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	590	<1	590	246	230	7,460	3.26	1,120	199	603	236	3,780
WWTP	**MW158**	**12 Mar 2024**	**0089_MW158_240312**	**Normal**	**EP2403226**	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	448	<1	448	133	138	4,060	1.72	477	205	336	108	2,240
WWTP	**MW161**	**12 Mar 2024**	**0089_MW161_240312**	**Normal**	**EP2403226**	<0.02	<0.05	<0.05	<0.02	<0.05	***2.95***	3.08	3.13	<1	532	<1	532	30.6	30.0	556	0.92	204	83	112	35	362
WWTP	**MW166**	**12 Mar 2024**	**0089_MW166_240312**	**Normal**	**EP2403226**	<0.02	<0.05	<0.05	<0.02	<0.05	***5.36***	6.42	6.55	<1	685	<1	685	50.0	46.5	1,180	3.64	147	161	121	59	621
WWTP	**MW171**	**12 Mar 2024**	**0089_MW171_240312**	**Normal**	**EP2403226**	<0.02	<0.05	<0.05	<0.02	<0.05	*1.29*	3.02	3.35	<1	517	<1	517	130	132	3,820	0.76	550	183	335	119	2,110
WWTP	**MW173**	**13 Mar 2024**	**0089_MW173_240313**	**Normal**	**EP2403299**	<0.02	<0.05	<0.05	<0.02	<0.05	***4.08***	4.67	4.97	<1	393	<1	393	20.6	21.5	405	2.06	64	115	67	17	225
WWTP	**MW193**	**12 Mar 2024**	**0089_MW193_240312**	**Normal**	**EP2403216**	<0.02	<0.05	<0.05	<0.02	<0.05	***15.0***	19.2	21.5	<1	1,030	<1	1,030	47.0	39.7	795	8.36	191	149	137	38	461
WWTP	**MW195D**	**12 Mar 2024**	**0089_MW195D_240312**	**Normal**	**EP2403216**	<0.02	<0.05	<0.05	<0.02	<0.05	0.02	0.03	0.03	<1	188	<1	188	326	325	10,400	0.14	1,370	368	776	298	5,400
WWTP	**MW195S**	**12 Mar 2024**	**0089_MW195S_240312**	**Normal**	**EP2403216**	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	556	<1	556	38.2	35.6	784	3.49	237	171	114	36	385
WWTP	**MW196**	**12 Mar 2024**	**0089_MW196_240312**	**Normal**	**EP2403226**	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	229	<1	229	6.01	6.74	36	5.71	20	75	22	2	26
WWTP	**MW199**	**12 Mar 2024**	**0089_MW199_240312**	**Normal**	**EP2403216**	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	720	<1	720	197	198	6,040	0.29	600	250	470	145	3,300
WWTP	**MW200**	**13 Mar 2024**	**0089_MW200_240313**	**Normal**	**EP2403299**	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	439	<1	439	79.9	72.0	2,380	5.21	194	104	108	72	1,290
WWTP	**MW202**	**12 Mar 2024**	**0089_MW202_240312**	**Normal**	**EP2403216**	<0.02	<0.05	<0.05	<0.02	<0.05	0.05	0.05	0.05	<1	355	<1	355	13.4	13.0	195	1.62	41	105	25	6	128
WWTP	**MW203**	**13 Mar 2024**	**0089_MW203_240313**	**Normal**	**EP2403299**	<0.02	<0.05	<0.05	<0.02	<0.05	*0.10*	0.10	0.12	<1	337	<1	337	11.8	13.0	107	4.93	99	80	55	10	98
HSF	**MW214**	**11 Mar 2024**	**0089_MW214_240311**	**Normal**	**EP2403152**	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	379	<1	379	64.6	60.2	1,940	3.55	111	260	122	11	848
HSF	**MW215**	**11 Mar 2024**	**0089_MW215_240311**	**Normal**	**EP2403152**	<0.02	<0.05	<0.05	<0.02	<0.05	*0.50*	0.75	0.82	<1	285	<1	285	17.6	15.1	354	7.72	94	132	31	9	132
HSF	**MW216**	**12 Mar 2024**	**0089_MW216_240312**	**Normal**	**EP2403226**	<0.02	<0.05	<0.05	<0.02	<0.05	*0.93*	26.2	26.4	<1	283	<1	283	25.7	25.5	616	0.38	127	152	56	11	299
HSF	**MW217**	**13 Mar 2024**	**0089_MW217_240313**	**Normal**	**EP2403298**	<0.02	<0.05	<0.05	<0.02	<0.05	*0.08*	40.1	40.1	<1	249	<1	249	6.44	7.02	38	4.32	19	90	12	6	32
HSF	**MW220**	**13 Mar 2024**	**0089_MW220_240313**	**Normal**	**EP2403298**	<0.02	<0.05	<0.05	<0.02	<0.05	***3.87***	4.22	4.26	<1	240	<1	240	6.72	7.15	55	3.09	18	90	13	6	33
HSF	**MW224**	**13 Mar 2024**	**0089_MW224_240313**	**Normal**	**EP2403298**	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	226	<1	226	8.39	8.07	110	1.94	37	58	22	4	75
HSF	**MW225**	**12 Mar 2024**	**0089_MW225_240312**	**Normal**	**EP2403226**	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	450	<1	450	35.0	30.0	860	7.70	83	176	73	7	345
HSF	**MW225**	**12 Mar 2024**	**0089_QC118_240312**	**Field Duplicate**	**EP2403226**	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	419	<1	419	40.4	37.0	1,080	4.51	77	190	94	8	449
HSF	**MW225**	**12 Mar 2024**	**0089_QC218_240312**	**Interlab Duplicate**	**1078840**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.01	<0.05	<0.1													
HSF	**MW226**	**12 Mar 2024**	**0089_MW226_240312**	**Normal**	**EP2403226**	<0.02	<0.05	<0.05	<0.02	<0.05	0.01	0.01	0.01	<1	630	<1	630	479	509	14,900	3.05	2,210	448	1,220	561	8,550
HSF	**MW227**	**12 Mar 2024**	**0089_MW227_240312**	**Normal**	**EP2403226**	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	426	<1	426	32.0	29.4	654	4.14	242	113	77	20	390
HSF	**MW228**	**12 Mar 2024**	**0089_MW228_240312**	**Normal**	**EP2403226**	<0.02	<0.05	<0.05	<0.02	<0.05	*0.67*	19.0	19.3	<1	749	<1	749	113	113	3,000	0.36	628	145	290	109	1,830
HSF	**MW228**	**12 Mar 2024**	**0089_QC113_240312**	**Field Duplicate**	**EP2403226**	<0.02	<0.05	<0.05	<0.02	<0.05	*0.66*	17.2	17.4	<1	691	<1	691	121	121	3,320	0.08	634	146	299	111	1,980
HSF	**MW228**	**12 Mar 2024**	**0089_QC213_240312**	**Interlab Duplicate**	**1078840**	<0.05	<0.05	<0.05	<0.05	<0.05	*1.1*	15.9	16.46													
AVCAT Storage and Fuel Fa	**MW233**	**12 Mar 2024**	**0089_MW233_240312**	**Normal**	**EP2403218**	<0.02	<0.05	<0.05	<0.02	<0.05	*0.08*	0.08	0.08	<1	126	<1	126	3.20	3.35	19	2.27	7	43	5	2	17
AVCAT Storage and Fuel Fa	**MW236**	**12 Mar 2024**	**0089_MW236_240312**	**Normal**	**EP2403218**	<0.02	<0.05	<0.05	<0.02	<0.05	***78.3***	80.8	84.1	<1	278	<1	278	6.75	7.51	30	5.32	17	105	16	<1	22
AVCAT Storage and Fuel Fa	**MW238**	**12 Mar 2024**	**0089_MW238_240312**	**Normal**	**EP2403218**	<0.02	<0.05	<0.05	<0.02	<0.05	0.02	0.02	0.02	<1	232	<1	232	7.16	8.06	40	5.92	67	100	18	6	33
AVCAT Storage and Fuel Fa	**MW239**	**12 Mar 2024**	**0089_MW239_240312**	**Normal**	**EP2403218**	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	207	<1	207	6.12	7.01	32	6.76	52	91	11	5	33
AVCAT Storage and Fuel Fa	**MW240**	**12 Mar 2024**	**0089_MW240_240312**	**Normal**	**EP2403218**	<0.02	<0.05	<0.05	<0.02	<0.05	*1.72*	1.87	1.97	<1	263	<1	263	7.90	8.93	54	6.12	54	123	14	3	36
AVCAT Storage and Fuel Fa	**MW240**	**12 Mar 2024**	**0089_QC116_240312**	**Field Duplicate**	**EP2403218**	<0.02	<0.05	<0.05	<0.02	<0.05	*1.80*	1.96	2.06	<1	266	<1	266	7.96	8.93	54	5.74	54	123	14	3	36
AVCAT Storage and Fuel Fa	**MW240**	**12 Mar 2024**	**0089_QC216_240312**	**Interlab Duplicate**	**1078840**	<0.05	<0.05	<0.05	<0.05	<0.05	*0.22*	0.22	0.22													
AVCAT Storage and Fuel Fa	**MW242**	**12 Mar 2024**	**0089_MW242_240312**	**Normal**	**EP2403218**	<0.02	<0.05	<0.05	<0.02	<0.05	0.01	0.01	0.01	<1	175	<1	175	4.59	4.85	21	2.73	24	68	11	1	12
AVCAT Storage and Fuel Fa	**MW242**	**12 Mar 2024**	**0089_QC117_240312**	**Field Duplicate**	**EP2403218**	<0.02	<0.05	<0.05	<0.02	<0.05	0.01	0.01	0.01	<1	175	<1	175	4.59	4.80	21	2.21	24	67	11	1	12
AVCAT Storage and Fuel Fa	**MW242**	**12 Mar 2024**	**0089_QC217_240312**	**Interlab Duplicate**	**1078840**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.01	<0.05	<0.1													
AVCAT Storage and Fuel Fa	**MW243**	**12 Mar 2024**	**0089_MW243_240312**	**Normal**	**EP2403218**	<0.02	<0.05	<0.05	<0.02	<0.05	0.07	0.07	0.07	<1	298	<1	298	9.03	9.72	58	3.72	69	127	17	8	41
AVCAT Storage and Fuel Fa	**MW245**	**12 Mar 2024**	**0089_MW245_240312**	**Normal**	**EP2403218**	<0.02	<0.05	<0.05	<0.02	<0.05	0.02	0.02	0.02	<1	402	<1	402	9.03	9.18	31	0.82	6	136	16	3	23
AVCAT Storage and Fuel Fa	**MW249**	**13 Mar 2024**	**0089_MW249_240313**	**Normal**	**EP2403298**	<0.02	<0.05	<0.05	<0.02	<0.05	*0.29*	0.31	0.31	<1	437	<1	437	15.7	13.9	212	5.82	46	97	42	10	124
Fire Station, Flammable/Hazardous Goods and Waste Storage, Ship Sullage	**MW255**	**12 Mar 2024**	**0089_MW255_240312**	**Normal**	**EP2403218**	<0.02	<0.05	<0.05	<0.02	<0.05	***13.5***	15.7	16.2	<1	271	<1	271	7.75	8.37	57	3.83	35	92	14	4	58
	MW256	**12 Mar 2024**	**0089_MW256_240312**	**Normal**	**EP2403218**	<0.02	<0.05	<0.05	<0.02	<0.05	***31.1***	52.9	58.4	<1	540	<1	540	26.5	24.1	495	4.84	86	145	80	2	235
	MW257	**11 Mar 2024**	**0089_MW257_240311**	**Normal**	**EP2403149**	<0.02	<0.05	<0.05	<0.02	<0.05	*1.36*	2.00	2.02	<1	246	<1	246	6.39	6.42	39	0.26	18	81	11	5	31
	MW258	**11 Mar 2024**	**0089_MW258_240311**	**Normal**	**EP2403149**	<0.02	<0.05	<0.05	<0.02	<0.05	***18.7***	34.2	37.8	<1	586	<1	586	18.6	16.3	162	6.64	112	157	44	19	100
	MW259	**11 Mar 2024**	**0089_MW259_240311**	**Normal**	**EP2403149**	<0.02	<0.05	<0.05	<0.02	<0.05	*0.12*	0.17	0.17	<1	258	<1	258	6.31	6.66	29	2.76	16	88	14	3	24
Dredge Spoil / Careening B	**MW268**	**12 Mar 2024**	**0089_MW268_240312**	**Normal**	**EP2403218**	<0.02	<0.05	<0.05	<0.02	<0.05	*0.34*	0.40	0.46	<1	466	<1	466	70.3	68.1	1,740	1.59	570	175	194	56	964
Dredge Spoil / Careening B	**MW269**	**12 Mar 2024**	**0089_MW269_240312**	**Normal**	**EP2403218**	<0.02	<0.05	<0.05	<0.02	<0.05	*0.96*	1.34	1.46	<1	460	<1	460	17.6	15.8	249	5.44	65	82	60	13	147
HSF	**MW282**	**13 Mar 2024**	**0089_MW282_240313**	**Normal**	**EP2403298**	<0.02	<0.05	<0.05	<0.02	<0.05	***99.7***	119	131	<1	490	<1	490	12.7	12.6	64	0.42	54	162	30	4	45
Accomodation Area	**MW288**	**12 Mar 2024**	**0089_MW288_240312**	**Normal**	**EP2403218**	<0.02	<0.05	<0.05	<0.02	<0.05	*0.47*	0.47	0.47	<1	322	<1	322	8.73	8.99	57	1.49	33	112	21	6	35
Accomodation Area	**MW289**	**11 Mar 2024**	**0089_MW289_240311**	**Normal**	**EP2403138**	<0.02	<0.05	<0.05	<0.02	<0.05	*1.68*	1.78	1.86	<1	417	<1	417	12.7	12.0	97	2.83	80	112	33	8	81
Accomodation Area	**MW289**	**11 Mar 2024**	**0089_QC101_240311**	**Field Duplicate**	**EP2403138**	<0.02	<0.05	<0.05	<0.02	<0.05	*1.68*	1.78	1.86	<1	431	<1	431	13.1	12.0	97	4.15	83	112	33	8	81
Accomodation Area	**MW289**	**11 Mar 2024**	**0089_QC201_240311**	**Interlab Duplicate**	**1078840**	<0.05	<0.05	<0.05	<0.05	<0.05	*1.78*	1.94	2.06													
AVCAT Storage and Fuel Fa	**MW496**	**13 Mar 2024**	**0089_MW496_240313**	**Normal**	**EP2403298**	<0.02	<0.05	<0.05	<0.02	<0.05	***6.24***	6.59	6.73	<1	407	<1	407	15.1	13.0	207	7.69	55	67	35	15	146
FTA	**MW500**	**11 Mar 2024**	**0089_MW500_240311**	**Normal**	**EP2403138**	<0.02	<0.05	<0.05	<0.02	<0.05	***69.2***	74.6	79.5	<1	453	<1	453	11.6	10.7	64	4.22	37	151	18	4	36
AVCAT Storage and Fuel Fa	**MW516**	**13 Mar 2024**	**0089_MW516_240313**	**Normal**	**EP2403298**	<0.02	<0.05	<0.05	<0.02	<0.05	***3.45***	3.51	3.51	<1	500	<1	500	12.4	11.6	66	3.05	26	112	40	10	58

B1 - Water Analyticl Results

	PFAS - Perfluoroalkyl Sulfonamides					PFAS			Inorganics									Metals			
	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 (WA DER List)	Sum of PFAS	Carbonate Alkalinity (as CaCO3)	Alkalinity (Bicarbonate as CaCO3)	Alkalinity (Hydroxide) as CaCO3	Alkalinity (total) as CaCO3	Anions Total	Cations Total	Chloride	Ionic Balance	Sulphate as SO4 - Turbidimetric (filtered)	Calcium (filtered)	Magnesium (filtered)	Potassium (filtered)	Sodium (filtered)
	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	mg/L	mg/L	mg/L	mg/L	meq/L	meq/L	mg/L	%	mg/L	mg/L	mg/L	mg/L	mg/L
LOR - Limit of Reporting	0.02	0.05	0.05	0.02	0.05	0.01	0.01	0.01	1	1	1	1	0.01	0.01	1	0.01	1	1	1	1	1
PFAS NEMP 2020 Drinking Water						*0.07*															
PFAS NEMP 2020 Freshwater 99%																					
PFAS NEMP 2020 Recreational Water						**2**															
Monitoring Area	**Location Code**	**Date**	**Field ID**	**Sample Type**	**Lab Report**																
WWTP (East)	**PW304**	**12 Mar 2024**	**0089_PW304_240312**	**Normal**	**EP2403250**	<0.02	<0.05	<0.05	<0.02	<0.05	0.04	0.04	0.04	<1	208	<1	208	651	713	20,800	4.54	2,890	520	1,640	667	12,300
WWTP (East)	**PW304**	**12 Mar 2024**	**0089_QC111_240312**	**Field Duplicate**	**EP2403250**	<0.02	<0.05	<0.05	<0.02	<0.05	0.05	0.05	0.05	<1	208	<1	208	651	687	20,800	2.67	2,900	513	1,640	684	11,700
WWTP (East)	**PW304**	**12 Mar 2024**	**0089_QC211_240312**	**Interlab Duplicate**	**1078840**	<0.05	<0.05	<0.05	<0.05	<0.05	*0.12*	0.17	0.17													
HSF	**PW306**	**11 Mar 2024**	**0089_PW306_240311**	**Normal**	**EP2403147**	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	136	<1	136	600	686	19,300	6.65	2,560	489	1,550	644	11,900
HSF	**PW307**	**11 Mar 2024**	**0089_PW307_240311**	**Normal**	**EP2403147**	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	172	<1	172	597	691	19,200	7.31	2,500	488	1,560	649	12,000
HSF	**PW308**	**11 Mar 2024**	**0089_PW308_240311**	**Normal**	**EP2403147**	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	128	<1	128	578	674	18,400	7.71	2,690	480	1,520	629	11,700
HSF	**PW314**	**11 Mar 2024**	**0089_PW314_240311**	**Normal**	**EP2403147**	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	124	<1	124	598	714	19,200	8.88	2,580	507	1,610	673	12,400
HSF	**PW315**	**11 Mar 2024**	**0089_PW315_240311**	**Normal**	**EP2403147**	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	128	<1	128	604	702	19,400	7.57	2,580	498	1,580	658	12,200
HSF	**PW315**	**11 Mar 2024**	**0089_QC103_240311**	**Field Duplicate**	**EP2403147**	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	129	<1	129	610	701	19,600	7.00	2,600	494	1,570	660	12,200
HSF	**PW315**	**11 Mar 2024**	**0089_QC203_240311**	**Interlab Duplicate**	**1078840**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.01	<0.05	<0.1													
HSF	**PW316**	**11 Mar 2024**	**0089_PW316_240311**	**Normal**	**EP2403147**	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	125	<1	125	581	680	18,700	7.84	2,470	482	1,540	639	11,800
Demolition Ground	**PW329**	**11 Mar 2024**	**0089_PW329_240311**	**Normal**	**EP2403151**	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	132	<1	132	623	702	20,000	6.02	2,690	499	1,580	663	12,200
Demolition Ground	**PW330**	**11 Mar 2024**	**0089_PW330_240311**	**Normal**	**EP2403151**	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	158	<1	158	594	704	19,000	8.48	2,650	522	1,590	661	12,200
Demolition Ground	**PW331**	**11 Mar 2024**	**0089_PW331_240311**	**Normal**	**EP2403151**	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	124	<1	124	602	713	19,300	8.50	2,630	504	1,600	673	12,400
FTA	**PW335**	**11 Mar 2024**	**0089_PW335_240311**	**Normal**	**EP2403140**	<0.02	<0.05	<0.05	<0.02	<0.05	0.01	0.01	0.01	<1	186	<1	186	614	678	19,600	4.99	2,740	552	1,660	708	11,400
FTA	**PW335**	**11 Mar 2024**	**0089_QC104_240311**	**Field Duplicate**	**EP2403140**	<0.02	<0.05	<0.05	<0.02	<0.05	0.01	0.01	0.01	<1	198	<1	198	647	713	20,800	4.87	2,700	577	1,740	751	12,000
FTA	**PW335**	**11 Mar 2024**	**0089_QC204_240311**	**Interlab Duplicate**	**1078840**	<0.05	<0.05	<0.05	<0.05	<0.05	0.03	0.11	0.11													
FTA	**PW340**	**11 Mar 2024**	**0089_PW340_240311**	**Normal**	**EP2403140**	<0.02	<0.05	<0.05	<0.02	<0.05	0.02	0.02	0.02	<1	185	<1	185	620	678	19,800	4.41	2,790	548	1,650	725	11,400
FTA	**PW341**	**11 Mar 2024**	**0089_PW341_240311**	**Normal**	**EP2403140**	<0.02	<0.05	<0.05	<0.02	<0.05	0.01	0.01	0.01	<1	136	<1	136	595	618	19,000	1.94	2,690	488	1,520	642	10,400
WWTP (East)	**PW345**	**13 Mar 2024**	**0089_PW345_240313**	**Normal**	**EP2403297**	<0.02	<0.05	<0.05	<0.02	<0.05	0.01	0.01	0.01	<1	443	<1	443	576	634	18,300	4.81	2,430	518	1,450	570	10,900
Accomodation Area	**PW346**	**12 Mar 2024**	**0089_PW346_240312**	**Normal**	**EP2403219**	<0.02	<0.05	<0.05	<0.02	<0.05	*0.15*	0.15	0.15	<1	372	<1	372	477	507	15,000	3.04	2,220	436	1,260	499	8,470
WWTP (West)	**PW350**	**11 Mar 2024**	**0089_PW350_240311**	**Normal**	**EP2403147**	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	132	<1	132	595	684	19,100	6.94	2,580	483	1,530	634	11,900
WWTP (West)	**PW351**	**11 Mar 2024**	**0089_PW351_240311**	**Normal**	**EP2403147**	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	123	<1	123	611	690	19,700	6.10	2,540	489	1,550	647	12,000
WWTP (West)	**PW352**	**11 Mar 2024**	**0089_PW352_240311**	**Normal**	**EP2403147**	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	124	<1	124	586	686	18,800	7.86	2,560	488	1,550	645	11,900
Demolition Ground	**PW356**	**11 Mar 2024**	**0089_PW356_240311**	**Normal**	**EP2403151**	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	130	<1	130	610	685	19,600	5.77	2,640	490	1,540	642	11,900
Demolition Ground	**PW357**	**11 Mar 2024**	**0089_PW357_240311**	**Normal**	**EP2403151**	<0.02	<0.05	<0.05	<0.02	<0.05	0.01	0.01	0.01	<1	162	<1	162	600	714	19,200	8.72	2,640	521	1,600	676	12,400
Demolition Ground	**PW358**	**11 Mar 2024**	**0089_PW358_240311**	**Normal**	**EP2403151**	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	121	<1	121	619	624	19,900	0.46	2,640	471	1,510	611	10,600
FTA	**PW362**	**11 Mar 2024**	**0089_PW362_240311**	**Normal**	**EP2403140**	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	125	<1	125	586	642	18,700	4.54	2,710	509	1,580	667	10,800
FTA	**PW363**	**11 Mar 2024**	**0089_PW363_240311**	**Normal**	**EP2403140**	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	142	<1	142	586	672	18,700	6.79	2,690	531	1,650	700	11,300
FTA	**PW364**	**11 Mar 2024**	**0089_PW364_240311**	**Normal**	**EP2403140**	<0.02	<0.05	<0.05	<0.02	<0.05	0.02	0.02	0.02	<1	179	<1	179	600	672	19,200	5.69	2,640	545	1,650	707	11,300
WWTP (East)	**PW367**	**13 Mar 2024**	**0089_PW367_240313**	**Normal**	**EP2403297**	<0.02	<0.05	<0.05	<0.02	<0.05	*0.10*	0.10	0.10	<1	158	<1	158	550	623	17,700	6.23	2,300	466	1,470	540	10,700
WWTP (East)	**PW368**	**12 Mar 2024**	**0089_PW368_240312**	**Normal**	**EP2403250**	<0.02	<0.05	<0.05	<0.02	<0.05	*0.10*	0.10	0.10	<1	204	<1	204	674	777	21,500	7.06	3,060	572	1,780	733	13,400
WWTP (East)	**PW369**	**13 Mar 2024**	**0089_PW369_240313**	**Normal**	**EP2403297**	<0.02	<0.05	<0.05	<0.02	<0.05	0.02	0.02	0.02	<1	362	<1	362	568	604	18,200	3.06	2,260	502	1,420	533	10,300
Dredge Spoil / Careening B	**PW374**	**11 Mar 2024**	**0089_PW374_240311**	**Normal**	**EP2403147**	<0.02	<0.05	<0.05	<0.02	<0.05	0.02	0.43	0.43	<1	134	<1	134	616	704	19,800	6.61	2,650	502	1,590	669	12,200
Dredge Spoil / Careening B	**PW375**	**11 Mar 2024**	**0089_PW375_240311**	**Normal**	**EP2403147**	<0.02	<0.05	<0.05	<0.02	<0.05	0.01	0.23	0.23	<1	127	<1	127	639	634	20,500	0.33	2,780	475	1,520	624	10,800
Dredge Spoil / Careening B	**PW378**	**11 Mar 2024**	**0089_PW378_240311**	**Normal**	**EP2403147**	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	0.25	0.25	<1	129	<1	129	644	685	20,800	3.11	2,620	488	1,540	644	11,900
WWTP (West)	**PW380**	**11 Mar 2024**	**0089_PW380_240311**	**Normal**	**EP2403147**	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	126	<1	126	608	686	19,600	6.00	2,540	488	1,550	640	11,900
WWTP (West)	**PW381**	**11 Mar 2024**	**0089_PW381_240311**	**Normal**	**EP2403147**	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	123	<1	123	606	702	19,500	7.38	2,560	497	1,580	660	12,200
WWTP (West)	**PW401**	**11 Mar 2024**	**0089_PW401_240311**	**Normal**	**EP2403147**	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	124	<1	124	599	691	19,300	7.15	2,510	492	1,560	647	12,000
HSF	**PW405**	**12 Mar 2024**	**0089_PW405_240312**	**Normal**	**EP2403224**	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	112	<1	112	658	713	21,200	4.02	2,760	516	1,640	666	12,300
HSF	**PW405**	**12 Mar 2024**	**0089_QC114_240312**	**Field Duplicate**	**EP2403224**	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	112	<1	112	658	666	21,200	0.60	2,800	478	1,540	616	11,500
HSF	**PW405**	**12 Mar 2024**	**0089_QC214_240312**	**Interlab Duplicate**	**1078840**	<0.05	<0.05	<0.05	<0.05	<0.05	0.03	0.15	0.15													
HSF	**PW407**	**12 Mar 2024**	**0089_PW407_240312**	**Normal**	**EP2403224**	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	319	<1	319	500	484	16,000	1.68	2,050	358	1,120	447	8,330
HSF	**PW409**	**12 Mar 2024**	**0089_PW409_240312**	**Normal**	**EP2403224**	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	127	<1	127	658	654	21,200	0.28	2,750	474	1,500	605	11,300
HSF	**PW411**	**12 Mar 2024**	**0089_PW411_240312**	**Normal**	**EP2403224**	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	245	<1	245	652	686	20,900	2.55	2,750	524	1,580	639	11,800
HSF	**PW413**	**12 Mar 2024**	**0089_PW413_240312**	**Normal**	**EP2403224**	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	249	<1	249	652	690	21,000	2.83	2,640	508	1,590	647	11,900
HSF	**PW415**	**12 Mar 2024**	**0089_PW415_240312**	**Normal**	**EP2403224**	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	144	<1	144	654	654	21,100	0.03	2,700	471	1,500	605	11,300
FTA	**SW130**	**11 Mar 2024**	**0089_SW130_240311**	**Normal**	**EP2403140**	<0.02	<0.05	<0.05	<0.02	<0.05	0.01	0.04	0.04	<1	148	<1	148	611	640	19,600	2.37	2,640	508	1,560	664	10,800
FTA	**SW132**	**11 Mar 2024**	**0089_SW132_240311**	**Normal**	**EP2403140**	<0.02	<0.05	<0.05	<0.02	<0.05	0.01	0.05	0.05	<1	139	<1	139	576	676	18,300	8.02	2,740	538	1,650	704	11,400
FTA	**SW134**	**11 Mar 2024**	**0089_SW134_240311**	**Normal**	**EP2403140**	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	139	<1	139	574	607	18,300	2.82	2,640	484	1,500	628	10,200
Demolition Ground	**SW150**	**11 Mar 2024**	**0089_QC107_240311**	**Field Duplicate**	**EP2403151**	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	124	<1	124	588	697	18,800	8.52	2,630	495	1,570	655	12,100
Demolition Ground	**SW150**	**11 Mar 2024**	**0089_QC207_240311**	**Interlab Duplicate**	**1078840**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.01	<0.05	<0.1													
Demolition Ground	**SW150**	**11 Mar 2024**	**0089_SW150_240311**	**Normal**	**EP2403151**	<0.02	<0.05	<0.05	<0.02	<0.05	0.04	0.04	0.04	<1	124	<1	124	611	702	19,600	6.94	2,690	499	1,580	661	12,200
Demolition Ground	**SW152**	**11 Mar 2024**	**0089_SW152_240311**	**Normal**	**EP2403151**	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	124	<1	124	634	720	20,500	6.30	2,580	510	1,620	678	12,500
Demolition Ground	**SW154**	**11 Mar 2024**	**0089_SW154_240311**	**Normal**	**EP2403151**	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	124	<1	124	595	654	19,000	4.70	2,710	487	1,580	642	11,100
Demolition Ground	**SW156**	**11 Mar 2024**	**0089_SW156_240311**	**Normal**	**EP2403151**	<0.02	<0.05	<0.05	<0.02	<0.05	0.04	0.04	0.04	<1	124	<1	124	596	680	19,100	6.60	2,640	484	1,540	636	11,800
WWTP (East)	**SW305**	**12 Mar 2024**	**0089_QC112_240312**	**Field Duplicate**	**EP2403250**	<0.02	<0.05	<0.05	<0.02	<0.05	*0.19*	0.19	0.19	<1	171	<1	171	572	649	18,300	6.29	2,530	478	1,490	605	11,200
WWTP (East)	**SW305**	**12 Mar 2024**	**0089_QC212_240312**	**Interlab Duplicate**	**1078840**	<0.05	<0.05	<0.05	<0.05	<0.05	*0.51*	0.58	0.58													
WWTP (East)	**SW305**	**12 Mar 2024**	**0089_SW305_240312**	**Normal**	**EP2403250**	<0.02	<0.05	<0.05	<0.02	<0.05	*0.79*	0.81	0.81	<1	201	<1	201	593	649	19,000	4.53	2,530	483	1,480	619	11,200
HSF	**SW309**	**11 Mar 2024**	**0089_QC102_240311**	**Field Duplicate**	**EP2403147**	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	124	<1	124	585	690	18,800	8.25	2,520	490	1,550	647	12,000
HSF	**SW309**	**11 Mar 2024**	**0089_QC202_240311**	**Interlab Duplicate**	**1078840**	<0.05	<0.05	<0.05	<0.05	<0.05	0.02	0.09	<0.1													
HSF	**SW309**	**11 Mar 2024**	**0089_SW309_240311**	**Normal**	**EP2403147**	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	125	<1	125	595	708	19,100	8.68	2,570	502	1,590	664	12,300
HSF	**SW310**	**11 Mar 2024**	**0089_SW310_240311**	**Normal**	**EP2403147**	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	124	<1	124	583	691	18,700	8.48	2,560	489	1,560	651	12,000
HSF	**SW311**	**11 Mar 2024**	**0089_SW311_240311**	**Normal**	**EP2403147**	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	123	<1	123	589	692	18,900	8.02	2,560	493	1,560	649	12,000
Dredge Spoil / Careening B	**SW317**	**11 Mar 2024**	**0089_SW317_240311**	**Normal**	**EP2403147**	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	126	<1	126	593	697	19,000	8.09	2,600	496	1,570	654	12,100
Dredge Spoil / Careening B	**SW318**	**11 Mar 2024**	**0089_SW318_240311**	**Normal**	**EP2403147**	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	126	<1	126	598	690	19,200	7.16	2,600	489	1,550	647	12,000
Dredge Spoil / Careening B	**SW319**	**11 Mar 2024**	**0089_SW319_240311**	**Normal**	**EP2403147**	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	124	<1	124	576	668	18,500	7.38	2,480	466	1,510	614	11,600
WWTP (West)	**SW353**	**11 Mar 2024**	**0089_SW353_240311**	**Normal**	**EP2403147**	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	123	<1	123	594	691	19,100	7.58	2,530	490	1,560	645	12,000
WWTP (East)	**SW370**	**13 Mar 2024**	**0089_SW370_240313**	**Normal**	**EP2403297**	<0.02	<0.05	<0.05	<0.02	<0.05	0.06	0.06	0.06	<1	234	<1	234	556	626	17,800	5.93	2,340	489	1,480	544	10,700
WWTP (East)	**SW371**	**12 Mar 2024**	**0089_SW371_240312**	**Normal**	**EP2403250**	<0.02	<0.05	<0.05	<0.02	<0.05	*0.09*	0.09	0.09	<1	156	<1	156	581	675	18,600	7.48	2,550	496	1,570	638	11,600
WWTP (East)	**SW372**	**12 Mar 2024**	**0089_SW372_240312**	**Normal**	**EP2403219**	<0.02	<0.05	<0.05	<0.02	<0.05	*0.21*	0.21	0.21	<1	153	<1	153	550	616	17,600	5.61	2,450	475	1,510	612	10,400
WWTP (West)	**SW373**	**12 Mar 2024**	**0089_SW373_240312**	**Normal**	**EP2403219**	<0.02	<0.05	<0.05	<0.02	<0.05	*0.17*	0.17	0.17	<1	136	<1	136	571	604	18,200	2.87	2,620	474	1,480	597	10,200
WWTP (West)	**SW382**	**11 Mar 2024**	**0089_SW382_240311**	**Normal**	**EP2403147**	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	123	<1	123	607	695	19,600	6.74	2,480	491	1,550	640	12,100
WWTP (West)	**SW383**	**11 Mar 2024**	**0089_SW383_240311**	**Normal**	**EP2403147**	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	122	<1	122	570	681	18,300	8.85	2,470	489	1,540	638	11,800
WWTP (West)	**SW384**	**11 Mar 2024**	**0089_SW384_240311**	**Normal**	**EP2403147**	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	123	<1	123	598	697	19,300	7.60	2,480	499	1,570	650	12,100
HSF	**SW406**	**12 Mar 2024**	**0089_SW406_240312**	**Normal**	**EP2403224**	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	130	<1	130	650	677	20,900	2.06	2,760	489	1,550	626	11,700
HSF	**SW408**	**12 Mar 2024**	**0089_SW408_240312**	**Normal**	**EP2403224**	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	130	<1	130	653	643	21,000	0.76	2,780	466	1,480	591	11,100
HSF	**SW410**	**12 Mar 2024**	**0089_SW410_240312**	**Normal**	**EP2403224**	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	132	<1	132	649	655	20,900	0.46	2,740	478	1,510	611	11,300
HSF	**SW412**	**12 Mar 2024**	**0089_SW412_240312**	**Normal**	**EP2403224**	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	123	<1	123	649	678	20,900	2.17	2,750	493	1,560	634	11,700
HSF	**SW414**	**12 Mar 2024**	**0089_SW414_240312**	**Normal**	**EP2403224**	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	123	<1	123	654	660	21,100	0.49	2,710	479	1,520	613	11,400
HSF	**SW416**	**12 Mar 2024**	**0089_SW416_240312**	**Normal**	**EP2403224**	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	123	<1	123	651	649	21,000	0.22	2,720	470	1,490	601	11,200

Environmental Standards
HEPA, January 2020, PFAS NEMP 2020 Drinking Water
HEPA, January 2020, PFAS NEMP 2020 Freshwater 99%
HEPA, January 2020, PFAS NEMP 2020 Recreational Water
Env Stds Comments
*Practical screening guideline of 0.01 µg/L adopted base on typical current laboratory limit of reporting.
Notes:
First-time detection of PFOA or PFOS+PFHxS
New exceedance of guideline value

B2 - Sediment Analytical Results

						PFAS - Perfluoroalkyl Sulfonic Acids						PFAS - Perfluoroalkyl Carboxylic Acids										
						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)
						mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
LOR - Limit of Reporting						0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.001	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0005
Monitoring Area	**Location Code**	**Date**	**Field ID**	**Sample Type**	**Lab Report Number**																	
WWTP	SD304	12 Mar 2024	0089_QC110_240312	Field Duplicate	EP2403217	<0.0002	<0.0002	<0.0002	<0.0002	0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
WWTP	SD304	12 Mar 2024	0089_QC210_240312	Interlab Duplicate	1078840	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
WWTP	SD304	12 Mar 2024	0089_SD304_240312	Normal	EP2403217	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
HSF	SD306	11 Mar 2024	0089_SD306_240311	Normal	EP2403148	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
HSF	SD307	11 Mar 2024	0089_SD307_240311	Normal	EP2403148	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
HSF	SD308	11 Mar 2024	0089_SD308_240311	Normal	EP2403148	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
HSF	SD314	11 Mar 2024	0089_SD314_240311	Normal	EP2403148	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
HSF	SD315	11 Mar 2024	0089_QC106_240311	Field Duplicate	EP2403148	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
HSF	SD315	11 Mar 2024	0089_QC206_240311	Interlab Duplicate	1078840	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
HSF	SD315	11 Mar 2024	0089_SD315_240311	Normal	EP2403148	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
HSF	SD316	11 Mar 2024	0089_SD316_240311	Normal	EP2403148	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
Demolition ground	SD329	11 Mar 2024	0089_SD329_240311	Normal	EP2403150	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
Demolition ground	SD330	11 Mar 2024	0089_SD330_240311	Normal	EP2403150	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
Demolition ground	SD331	11 Mar 2024	0089_SD331_240311	Normal	EP2403150	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
FTA	SD335	11 Mar 2024	0089_SD335_240311	Normal	EP2403139	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
FTA	SD340	11 Mar 2024	0089_SD340_240311	Normal	EP2403139	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
FTA	SD341	11 Mar 2024	0089_SD341_240311	Normal	EP2403139	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
WWTP	SD345	13 Mar 2024	0089_SD345_240313	Normal	EP2403295	<0.0002	<0.0002	<0.0002	<0.0002	0.0003	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
Accomodation Area	SD346	12 Mar 2024	0089_SD346_240312	Normal	EP2403220	<0.0002	<0.0002	<0.0002	<0.0002	0.0004	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
WWTP	SD350	11 Mar 2024	0089_SD350_240311	Normal	EP2403148	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
WWTP	SD351	11 Mar 2024	0089_SD351_240311	Normal	EP2403148	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
WWTP	SD352	11 Mar 2024	0089_SD352_240311	Normal	EP2403148	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
Demolition ground	SD356	11 Mar 2024	0089_SD356_240311	Normal	EP2403150	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
Demolition ground	SD357	11 Mar 2024	0089_SD357_240311	Normal	EP2403150	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
Demolition ground	SD358	11 Mar 2024	0089_QC108_240311	Field Duplicate	EP2403150	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
Demolition ground	SD358	11 Mar 2024	0089_QC208_240311	Interlab Duplicate	1078840	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Demolition ground	SD358	11 Mar 2024	0089_SD358_240311	Normal	EP2403150	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
FTA	SD362	11 Mar 2024	0089_SD362_240311	Normal	EP2403139	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
FTA	SD363	11 Mar 2024	0089_SD363_240311	Normal	EP2403139	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
FTA	SD364	11 Mar 2024	0089_SD364_240311	Normal	EP2403139	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
WWTP	SD367	13 Mar 2024	0089_SD367_240313	Normal	EP2403295	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
WWTP	SD368	12 Mar 2024	0089_SD368_240312	Normal	EP2403217	<0.0002	<0.0002	<0.0002	<0.0002	0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
WWTP	SD369	13 Mar 2024	0089_SD369_240313	Normal	EP2403295	<0.0002	<0.0002	<0.0002	<0.0002	0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
Dredge spoil and careening bay	SD374	11 Mar 2024	0089_SD374_240311	Normal	EP2403148	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
Dredge spoil and careening bay	SD375	11 Mar 2024	0089_SD375_240311	Normal	EP2403148	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	0.0003	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
Dredge spoil and careening bay	SD378	11 Mar 2024	0089_SD378_240311	Normal	EP2403148	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	0.0003	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
WWTP	SD380	11 Mar 2024	0089_SD380_240311	Normal	EP2403148	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
WWTP	SD381	11 Mar 2024	0089_SD381_240311	Normal	EP2403148	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
WWTP	SD401	11 Mar 2024	0089_SD401_240311	Normal	EP2403148	<0.0002	<0.0002	<0.0002	<0.0002	0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
HSF	SD405	12 Mar 2024	0089_QC115_240312	Field Duplicate	EP2403225	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
HSF	SD405	12 Mar 2024	0089_QC215_240312	Interlab Duplicate	1078840	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
HSF	SD405	12 Mar 2024	0089_SD405_240312	Normal	EP2403225	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
HSF	SD407	12 Mar 2024	0089_SD407_240312	Normal	EP2403225	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
HSF	SD409	12 Mar 2024	0089_SD409_240312	Normal	EP2403225	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
HSF	SD411	12 Mar 2024	0089_SD411_240312	Normal	EP2403225	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
HSF	SD413	12 Mar 2024	0089_SD413_240312	Normal	EP2403225	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
HSF	SD415	12 Mar 2024	0089_SD415_240312	Normal	EP2403225	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005

Notes:

First-time detection of PFOA or PFOS+PFHxS

B2 - Sediment Analytical Results

						PFAS - (n:2) Fluorotelomer Sulfonic Acids				PFAS - Perfluoroalkyl Sulfonamides							PFAS		
						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 (WA DER List)	Sum of PFAS
						mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
LOR - Limit of Reporting						0.0005	0.0005	0.0005	0.0005	0.0002	0.0005	0.0002	0.0005	0.0005	0.0002	0.0005	0.0002	0.0002	0.0002
Monitoring Area	**Location Code**	**Date**	**Field ID**	**Sample Type**	**Lab Report Num**														
WWTP	**SD304**	**12 Mar 2024**	**0089_QC110_240312**	**Field Duplicate**	**EP2403217**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	0.0002	0.0002	0.0002
WWTP	**SD304**	**12 Mar 2024**	**0089_QC210_240312**	**Interlab Duplicate**	**1078840**	<0.005	<0.01	<0.005	<0.005	<0.005	<0.005	<0.01	<0.005	<0.005	<0.01	<0.005	<0.005	<0.01	<0.05
WWTP	**SD304**	**12 Mar 2024**	**0089_SD304_240312**	**Normal**	**EP2403217**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
HSF	**SD306**	**11 Mar 2024**	**0089_SD306_240311**	**Normal**	**EP2403148**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
HSF	**SD307**	**11 Mar 2024**	**0089_SD307_240311**	**Normal**	**EP2403148**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
HSF	**SD308**	**11 Mar 2024**	**0089_SD308_240311**	**Normal**	**EP2403148**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
HSF	**SD314**	**11 Mar 2024**	**0089_SD314_240311**	**Normal**	**EP2403148**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
HSF	**SD315**	**11 Mar 2024**	**0089_QC106_240311**	**Field Duplicate**	**EP2403148**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
HSF	**SD315**	**11 Mar 2024**	**0089_QC206_240311**	**Interlab Duplicate**	**1078840**	<0.005	<0.01	<0.005	<0.005	<0.005	<0.005	<0.01	<0.005	<0.005	<0.01	<0.005	<0.005	<0.01	<0.05
HSF	**SD315**	**11 Mar 2024**	**0089_SD315_240311**	**Normal**	**EP2403148**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
HSF	**SD316**	**11 Mar 2024**	**0089_SD316_240311**	**Normal**	**EP2403148**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
Demolition ground	**SD329**	**11 Mar 2024**	**0089_SD329_240311**	**Normal**	**EP2403150**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
Demolition ground	**SD330**	**11 Mar 2024**	**0089_SD330_240311**	**Normal**	**EP2403150**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
Demolition ground	**SD331**	**11 Mar 2024**	**0089_SD331_240311**	**Normal**	**EP2403150**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
FTA	**SD335**	**11 Mar 2024**	**0089_SD335_240311**	**Normal**	**EP2403139**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
FTA	**SD340**	**11 Mar 2024**	**0089_SD340_240311**	**Normal**	**EP2403139**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
FTA	**SD341**	**11 Mar 2024**	**0089_SD341_240311**	**Normal**	**EP2403139**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
WWTP	**SD345**	**13 Mar 2024**	**0089_SD345_240313**	**Normal**	**EP2403295**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	0.0003	0.0003	0.0003
Accomodation Area	**SD346**	**12 Mar 2024**	**0089_SD346_240312**	**Normal**	**EP2403220**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	0.0004	0.0004	0.0004
WWTP	**SD350**	**11 Mar 2024**	**0089_SD350_240311**	**Normal**	**EP2403148**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
WWTP	**SD351**	**11 Mar 2024**	**0089_SD351_240311**	**Normal**	**EP2403148**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
WWTP	**SD352**	**11 Mar 2024**	**0089_SD352_240311**	**Normal**	**EP2403148**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
Demolition ground	**SD356**	**11 Mar 2024**	**0089_SD356_240311**	**Normal**	**EP2403150**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
Demolition ground	**SD357**	**11 Mar 2024**	**0089_SD357_240311**	**Normal**	**EP2403150**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
Demolition ground	**SD358**	**11 Mar 2024**	**0089_QC108_240311**	**Field Duplicate**	**EP2403150**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
Demolition ground	**SD358**	**11 Mar 2024**	**0089_QC208_240311**	**Interlab Duplicate**	**1078840**	<0.005	<0.01	<0.005	<0.005	<0.005	<0.005	<0.01	<0.005	<0.005	<0.01	<0.005	<0.005	<0.01	<0.05
Demolition ground	**SD358**	**11 Mar 2024**	**0089_SD358_240311**	**Normal**	**EP2403150**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
FTA	**SD362**	**11 Mar 2024**	**0089_SD362_240311**	**Normal**	**EP2403139**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
FTA	**SD363**	**11 Mar 2024**	**0089_SD363_240311**	**Normal**	**EP2403139**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
FTA	**SD364**	**11 Mar 2024**	**0089_SD364_240311**	**Normal**	**EP2403139**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
WWTP	**SD367**	**13 Mar 2024**	**0089_SD367_240313**	**Normal**	**EP2403295**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
WWTP	**SD368**	**12 Mar 2024**	**0089_SD368_240312**	**Normal**	**EP2403217**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	0.0002	0.0002	0.0002
WWTP	**SD369**	**13 Mar 2024**	**0089_SD369_240313**	**Normal**	**EP2403295**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	0.0002	0.0002	0.0002
Dredge spoil and careening bay	**SD374**	**11 Mar 2024**	**0089_SD374_240311**	**Normal**	**EP2403148**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	0.0002	0.0002
Dredge spoil and careening bay	**SD375**	**11 Mar 2024**	**0089_SD375_240311**	**Normal**	**EP2403148**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	0.0003	0.0003
Dredge spoil and careening bay	**SD378**	**11 Mar 2024**	**0089_SD378_240311**	**Normal**	**EP2403148**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	0.0003	0.0003
WWTP	**SD380**	**11 Mar 2024**	**0089_SD380_240311**	**Normal**	**EP2403148**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
WWTP	**SD381**	**11 Mar 2024**	**0089_SD381_240311**	**Normal**	**EP2403148**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
WWTP	**SD401**	**11 Mar 2024**	**0089_SD401_240311**	**Normal**	**EP2403148**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	0.0002	0.0002	0.0002
HSF	**SD405**	**12 Mar 2024**	**0089_QC115_240312**	**Field Duplicate**	**EP2403225**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
HSF	**SD405**	**12 Mar 2024**	**0089_QC215_240312**	**Interlab Duplicate**	**1078840**	<0.005	<0.01	<0.005	<0.005	<0.005	<0.005	<0.01	<0.005	<0.005	<0.01	<0.005	<0.005	<0.01	<0.05
HSF	**SD405**	**12 Mar 2024**	**0089_SD405_240312**	**Normal**	**EP2403225**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
HSF	**SD407**	**12 Mar 2024**	**0089_SD407_240312**	**Normal**	**EP2403225**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
HSF	**SD409**	**12 Mar 2024**	**0089_SD409_240312**	**Normal**	**EP2403225**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
HSF	**SD411**	**12 Mar 2024**	**0089_SD411_240312**	**Normal**	**EP2403225**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
HSF	**SD413**	**12 Mar 2024**	**0089_SD413_240312**	**Normal**	**EP2403225**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
HSF	**SD415**	**12 Mar 2024**	**0089_SD415_240312**	**Normal**	**EP2403225**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002

Notes:

First-time detection of PFOA or PFOS+PFHxS

B3 - water samples Relative Percentage Differences (RPD)

		Date	11 Mar 2024	11 Mar 2024		11 Mar 2024	11 Mar 2024		11 Mar 2024	11 Mar 2024		11 Mar 2024	11 Mar 2024		11 Mar 2024	11 Mar 2024	
		Field ID	0089_MW289_240311	0089_QC101_240311		0089_MW289_240311	0089_QC201_240311		0089_SW309_240311	0089_QC102_240311		0089_SW309_240311	0089_QC202_240311		0089_PW315_240311	0089_QC103_240311	
		Matrix Type	Water	Water		Water	Water		Water	Water		Water	Water		Water	Water	
		Lab Report Number	EP2403138	EP2403138	RPD	EP2403138	1078840	RPD	EP2403147	EP2403147	RPD	EP2403147	1078840	RPD	EP2403147	EP2403147	RPD
	Unit	LOR															
PFAS - Perfluoroalkyl Sulfonic Acids																	
Perfluorobutane sulfonic acid (PFBS)	µg/L	0.01	0.03	0.03	0	0.03	0.03	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0
Perfluoropentane sulfonic acid (PFPeS)	µg/L	0.01	0.05	0.05	0	0.05	0.06	18	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0
Perfluorohexane sulfonic acid (PFHxS)	µg/L	0.01	0.49	0.49	0	0.49	0.78	**46**	<0.01	<0.01	0	<0.01	<0.01	0	<0.01	<0.01	0
Perfluoroheptane sulfonic acid (PFHpS)	µg/L	0.01	0.03	0.03	0	0.03	0.05	50	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0
Perfluorooctane sulfonic acid (PFOS)	µg/L	0.01	1.19	1.19	0	1.19	1.0	17	<0.01	<0.01	0	<0.01	0.02	67	<0.01	<0.01	0
Perfluorodecane sulfonic acid (PFDS)	µg/L	0.01	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0
PFAS - Perfluoroalkyl Carboxylic Acids																	
Perfluorobutanoic acid (PFBA)	µg/L	0.05	<0.1	<0.1	0	<0.1	<0.05	0	<0.1	<0.1	0	<0.1	<0.05	0	<0.1	<0.1	0
Perfluoropentanoic acid (PFPeA)	µg/L	0.01	<0.02	<0.02	0	<0.02	0.02	0	<0.02	<0.02	0	<0.02	0.03	40	<0.02	<0.02	0
Perfluorohexanoic acid (PFHxA)	µg/L	0.01	0.04	0.04	0	0.04	0.06	40	<0.02	<0.02	0	<0.02	0.04	67	<0.02	<0.02	0
Perfluoroheptanoic acid (PFHpA)	µg/L	0.02	<0.02	<0.02	0	<0.02	<0.05	0	<0.02	<0.02	0	<0.02	<0.05	0	<0.02	<0.02	0
Perfluorooctanoic acid (PFOA)	µg/L	0.01	0.03	0.03	0	0.03	0.05	50	<0.01	<0.01	0	<0.01	<0.01	0	<0.01	<0.01	0
Perfluorononanoic acid (PFNA)	µg/L	0.01	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0
Perfluorodecanoic acid (PFDA)	µg/L	0.01	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0
Perfluoroundecanoic acid (PFUnDA)	µg/L	0.01	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0
Perfluorododecanoic acid (PFDoDA)	µg/L	0.01	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0
Perfluorotridecanoic acid (PFTrDA)	µg/L	0.01	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0
Perfluorotetradecanoic acid (PFTeDA)	µg/L	0.01	<0.05	<0.05	0	<0.05	<0.01	0	<0.05	<0.05	0	<0.05	<0.01	0	<0.05	<0.05	0
PFAS - (n:2) Fluorotelomer Sulfonic Acids																	
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	µg/L	0.01	<0.05	<0.05	0	<0.05	<0.01	0	<0.05	<0.05	0	<0.05	<0.01	0	<0.05	<0.05	0
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	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
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	µg/L	0.01	<0.05	<0.05	0	<0.05	<0.01	0	<0.05	<0.05	0	<0.05	<0.01	0	<0.05	<0.05	0
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	µg/L	0.01	<0.05	<0.05	0	<0.05	<0.01	0	<0.05	<0.05	0	<0.05	<0.01	0	<0.05	<0.05	0
PFAS - Perfluoroalkyl Sulfonamides																	
Perfluorooctane sulfonamide (FOSA)	µg/L	0.02	<0.02	<0.02	0	<0.02	<0.05	0	<0.02	<0.02	0	<0.02	<0.05	0	<0.02	<0.02	0
N-Methyl perfluorooctane sulfonamide (MeFOSA)	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
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	µg/L	0.02	<0.02	<0.02	0	<0.02	<0.05	0	<0.02	<0.02	0	<0.02	<0.05	0	<0.02	<0.02	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
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	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
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	µg/L	0.02	<0.02	<0.02	0	<0.02	<0.05	0	<0.02	<0.02	0	<0.02	<0.05	0	<0.02	<0.02	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
PFAS																	
Sum of PFHxS and PFOS	µg/L	0.01	1.68	1.68	0	1.68	1.78	6	<0.01	<0.01	0	<0.01	0.02	67	<0.01	<0.01	0
Sum of PFAS (WA DER List)	µg/L	0.01	1.78	1.78	0	1.78	1.94	9	<0.01	<0.01	0	<0.01	0.09	160	<0.01	<0.01	0
Sum of PFAS	µg/L	0.01	1.86	1.86	0	1.86	2.06	10	<0.01	<0.01	0	<0.01	<0.1	0	<0.01	<0.01	0

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

B3 - water samples Relative Percentage Differences (RPD)

		Date	11 Mar 2024	11 Mar 2024		11 Mar 2024	11 Mar 2024		11 Mar 2024	11 Mar 2024		11 Mar 2024	11 Mar 2024		11 Mar 2024	11 Mar 2024	
		Field ID	0089_PW315_240311	0089_QC203_240311		0089_PW335_240311	0089_QC104_240311		0089_PW335_240311	0089_QC204_240311		0089_MW139_240311	0089_QC105_240311		0089_MW139_240311	0089_QC205_240311	
		Matrix Type	Water	Water		Water	Water		Water	Water		Water	Water		Water	Water	
		Lab Report Number	EP2403147	1078840	RPD	EP2403140	EP2403140	RPD	EP2403140	1078840	RPD	EP2403149	EP2403149	RPD	EP2403149	1078840	RPD
	Unit	LOR															
PFAS - Perfluoroalkyl Sulfonic Acids																	
Perfluorobutane sulfonic acid (PFBS)	µg/L	0.01	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0
Perfluoropentane sulfonic acid (PFPeS)	µg/L	0.01	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<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
Perfluoroheptane sulfonic acid (PFHpS)	µg/L	0.01	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0
Perfluorooctane sulfonic acid (PFOS)	µg/L	0.01	<0.01	<0.01	0	0.01	0.01	0	0.01	0.03	100	<0.01	<0.01	0	<0.01	<0.01	0
Perfluorodecane sulfonic acid (PFDS)	µg/L	0.01	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0
PFAS - Perfluoroalkyl Carboxylic Acids																	
Perfluorobutanoic acid (PFBA)	µg/L	0.05	<0.1	<0.05	0	<0.1	<0.1	0	<0.1	<0.05	0	<0.1	<0.1	0	<0.1	<0.05	0
Perfluoropentanoic acid (PFPeA)	µg/L	0.01	<0.02	0.02	0	<0.02	<0.02	0	<0.02	0.04	67	<0.02	<0.02	0	<0.02	<0.01	0
Perfluorohexanoic acid (PFHxA)	µg/L	0.01	<0.02	0.02	0	<0.02	<0.02	0	<0.02	0.04	67	<0.02	<0.02	0	<0.02	<0.01	0
Perfluoroheptanoic acid (PFHpA)	µg/L	0.02	<0.02	<0.05	0	<0.02	<0.02	0	<0.02	<0.05	0	<0.02	<0.02	0	<0.02	<0.05	0
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
Perfluorononanoic acid (PFNA)	µg/L	0.01	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0
Perfluorodecanoic acid (PFDA)	µg/L	0.01	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0
Perfluoroundecanoic acid (PFUnDA)	µg/L	0.01	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0
Perfluorododecanoic acid (PFDoDA)	µg/L	0.01	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0
Perfluorotridecanoic acid (PFTrDA)	µg/L	0.01	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0
Perfluorotetradecanoic acid (PFTeDA)	µg/L	0.01	<0.05	<0.01	0	<0.05	<0.05	0	<0.05	<0.01	0	<0.05	<0.05	0	<0.05	<0.01	0
PFAS - (n:2) Fluorotelomer Sulfonic Acids																	
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	µg/L	0.01	<0.05	<0.01	0	<0.05	<0.05	0	<0.05	<0.01	0	<0.05	<0.05	0	<0.05	<0.01	0
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	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
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	µg/L	0.01	<0.05	<0.01	0	<0.05	<0.05	0	<0.05	<0.01	0	<0.05	<0.05	0	<0.05	<0.01	0
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	µg/L	0.01	<0.05	<0.01	0	<0.05	<0.05	0	<0.05	<0.01	0	<0.05	<0.05	0	<0.05	<0.01	0
PFAS - Perfluoroalkyl Sulfonamides																	
Perfluorooctane sulfonamide (FOSA)	µg/L	0.02	<0.02	<0.05	0	<0.02	<0.02	0	<0.02	<0.05	0	<0.02	<0.02	0	<0.02	<0.05	0
N-Methyl perfluorooctane sulfonamide (MeFOSA)	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
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	µg/L	0.02	<0.02	<0.05	0	<0.02	<0.02	0	<0.02	<0.05	0	<0.02	<0.02	0	<0.02	<0.05	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
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	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
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	µg/L	0.02	<0.02	<0.05	0	<0.02	<0.02	0	<0.02	<0.05	0	<0.02	<0.02	0	<0.02	<0.05	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
PFAS																	
Sum of PFHxS and PFOS	µg/L	0.01	<0.01	<0.01	0	0.01	0.01	0	0.01	0.03	100	<0.01	<0.01	0	<0.01	<0.01	0
Sum of PFAS (WA DER List)	µg/L	0.01	<0.01	<0.05	0	0.01	0.01	0	0.01	0.11	167	<0.01	<0.01	0	<0.01	<0.05	0
Sum of PFAS	µg/L	0.01	<0.01	<0.1	0	0.01	0.01	0	0.01	0.11	167	<0.01	<0.01	0	<0.01	<0.1	0

B3 - water samples Relative Percentage Differences (RPD)

		Date	11 Mar 2024	11 Mar 2024		11 Mar 2024	11 Mar 2024		11 Mar 2024	11 Mar 2024		11 Mar 2024	11 Mar 2024		12 Mar 2024	12 Mar 2024	
		Field ID	0089_SW150_240311	0089_QC107_240311		0089_SW150_240311	0089_QC207_240311		0089_MW123_240311	0089_QC109_240311		0089_MW123_240311	0089_QC209_240311		0089_MW228_240312	0089_QC113_240312	
		Matrix Type	Water	Water		Water	Water		Water	Water		Water	Water		Water	Water	
		Lab Report Number	EP2403151	EP2403151	RPD	EP2403151	1078840	RPD	EP2403138	EP2403138	RPD	EP2403138	1078840	RPD	EP2403226	EP2403226	RPD
	Unit	LOR															
PFAS - Perfluoroalkyl Sulfonic Acids																	
Perfluorobutane sulfonic acid (PFBS)	µg/L	0.01	<0.02	<0.02	0	<0.02	<0.01	0	0.26	0.25	4	0.26	0.27	4	0.33	0.33	0
Perfluoropentane sulfonic acid (PFPeS)	µg/L	0.01	<0.02	<0.02	0	<0.02	<0.01	0	0.90	0.97	7	0.90	0.93	3	0.24	0.24	0
Perfluorohexane sulfonic acid (PFHxS)	µg/L	0.01	0.02	<0.01	67	0.02	<0.01	67	14.0	15.8	12	14.0	15	7	0.67	0.66	2
Perfluoroheptane sulfonic acid (PFHpS)	µg/L	0.01	<0.02	<0.02	0	<0.02	<0.01	0	1.11	1.18	6	1.11	0.90	**21**	<0.02	<0.02	0
Perfluorooctane sulfonic acid (PFOS)	µg/L	0.01	0.02	<0.01	67	0.02	<0.01	67	20.5	21.8	6	20.5	19	8	<0.01	<0.01	0
Perfluorodecane sulfonic acid (PFDS)	µg/L	0.01	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0
PFAS - Perfluoroalkyl Carboxylic Acids																	
Perfluorobutanoic acid (PFBA)	µg/L	0.05	<0.1	<0.1	0	<0.1	<0.05	0	0.1	0.1	0	0.1	0.09	11	1.7	1.6	6
Perfluoropentanoic acid (PFPeA)	µg/L	0.01	<0.02	<0.02	0	<0.02	<0.01	0	0.28	0.29	4	0.28	0.27	4	7.36	5.88	**22**
Perfluorohexanoic acid (PFHxA)	µg/L	0.01	<0.02	<0.02	0	<0.02	<0.01	0	1.68	1.67	1	1.68	1.5	11	6.37	6.11	4
Perfluoroheptanoic acid (PFHpA)	µg/L	0.02	<0.02	<0.02	0	<0.02	<0.05	0	0.25	0.25	0	0.25	0.27	8	1.47	1.44	2
Perfluorooctanoic acid (PFOA)	µg/L	0.01	<0.01	<0.01	0	<0.01	<0.01	0	0.90	0.99	10	0.90	1.0	11	0.34	0.35	3
Perfluorononanoic acid (PFNA)	µg/L	0.01	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	0.01	0	<0.02	<0.02	0
Perfluorodecanoic acid (PFDA)	µg/L	0.01	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0
Perfluoroundecanoic acid (PFUnDA)	µg/L	0.01	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0
Perfluorododecanoic acid (PFDoDA)	µg/L	0.01	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0
Perfluorotridecanoic acid (PFTrDA)	µg/L	0.01	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0
Perfluorotetradecanoic acid (PFTeDA)	µg/L	0.01	<0.05	<0.05	0	<0.05	<0.01	0	<0.05	<0.05	0	<0.05	<0.01	0	<0.05	<0.05	0
PFAS - (n:2) Fluorotelomer Sulfonic Acids																	
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	µg/L	0.01	<0.05	<0.05	0	<0.05	<0.01	0	<0.05	<0.05	0	<0.05	<0.01	0	<0.05	<0.05	0
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	µg/L	0.05	<0.05	<0.05	0	<0.05	<0.05	0	0.13	0.13	0	0.13	0.13	0	0.81	0.82	1
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	µg/L	0.01	<0.05	<0.05	0	<0.05	<0.01	0	<0.05	<0.05	0	<0.05	0.02	0	<0.05	<0.05	0
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	µg/L	0.01	<0.05	<0.05	0	<0.05	<0.01	0	<0.05	<0.05	0	<0.05	<0.01	0	<0.05	<0.05	0
PFAS - Perfluoroalkyl Sulfonamides																	
Perfluorooctane sulfonamide (FOSA)	µg/L	0.02	<0.02	<0.02	0	<0.02	<0.05	0	0.14	0.14	0	0.14	0.13	7	<0.02	<0.02	0
N-Methyl perfluorooctane sulfonamide (MeFOSA)	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
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	µg/L	0.02	<0.02	<0.02	0	<0.02	<0.05	0	<0.02	<0.02	0	<0.02	<0.05	0	<0.02	<0.02	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
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	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
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	µg/L	0.02	<0.02	<0.02	0	<0.02	<0.05	0	<0.02	<0.02	0	<0.02	<0.05	0	<0.02	<0.02	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
PFAS																	
Sum of PFHxS and PFOS	µg/L	0.01	0.04	<0.01	120	0.04	<0.01	120	34.5	37.6	9	34.5	34	1	0.67	0.66	2
Sum of PFAS (WA DER List)	µg/L	0.01	0.04	<0.01	120	0.04	<0.05	0	38.1	41.3	8	38.1	37.55	1	19.0	17.2	10
Sum of PFAS	µg/L	0.01	0.04	<0.01	120	0.04	<0.1	0	40.2	43.6	8	40.2	39.63	1	19.3	17.4	10

B3 - water samples Relative Percentage Differences (RPD)

Date			12 Mar 2024	12 Mar 2024		12 Mar 2024	12 Mar 2024		12 Mar 2024	12 Mar 2024		12 Mar 2024	12 Mar 2024		12 Mar 2024	12 Mar 2024	
Field ID			0089_MW228_240312	0089_QC213_240312		0089_PW405_240312	0089_QC114_240312		0089_PW405_240312	0089_QC214_240312		0089_SW305_240312	0089_QC112_240312		0089_SW305_240312	0089_QC212_240312	
Matrix Type			Water	Water		Water	Water		Water	Water		Water	Water		Water	Water	
Lab Report Number			EP2403226	1078840	RPD	EP2403224	EP2403224	RPD	EP2403224	1078840	RPD	EP2403250	EP2403250	RPD	EP2403250	1078840	RPD
	Unit	LOR															
PFAS - Perfluoroalkyl Sulfonic Acids																	
Perfluorobutane sulfonic acid (PFBS)	µg/L	0.01	0.33	0.38	14	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0
Perfluoropentane sulfonic acid (PFPeS)	µg/L	0.01	0.24	0.46	63	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0
Perfluorohexane sulfonic acid (PFHxS)	µg/L	0.01	0.67	1.1	49	<0.01	<0.01	0	<0.01	0.02	67	0.04	0.03	29	0.04	0.05	22
Perfluoroheptane sulfonic acid (PFHpS)	µg/L	0.01	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0
Perfluorooctane sulfonic acid (PFOS)	µg/L	0.01	<0.01	<0.01	0	<0.01	<0.01	0	<0.01	0.01	0	0.75	0.16	130	0.75	0.46	48
Perfluorodecane sulfonic acid (PFDS)	µg/L	0.01	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0
PFAS - Perfluoroalkyl Carboxylic Acids																	
Perfluorobutanoic acid (PFBA)	µg/L	0.05	1.7	1.1	43	<0.1	<0.1	0	<0.1	<0.05	0	<0.1	<0.1	0	<0.1	<0.05	0
Perfluoropentanoic acid (PFPeA)	µg/L	0.01	7.36	5.0	38	<0.02	<0.02	0	<0.02	0.04	67	<0.02	<0.02	0	<0.02	0.03	40
Perfluorohexanoic acid (PFHxA)	µg/L	0.01	6.37	5.5	15	<0.02	<0.02	0	<0.02	0.08	120	0.02	<0.02	0	0.02	0.04	67
Perfluoroheptanoic acid (PFHpA)	µg/L	0.02	1.47	1.4	5	<0.02	<0.02	0	<0.02	<0.05	0	<0.02	<0.02	0	<0.02	<0.05	0
Perfluorooctanoic acid (PFOA)	µg/L	0.01	0.34	0.51	40	<0.01	<0.01	0	<0.01	<0.01	0	<0.01	<0.01	0	<0.01	<0.01	0
Perfluorononanoic acid (PFNA)	µg/L	0.01	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0
Perfluorodecanoic acid (PFDA)	µg/L	0.01	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0
Perfluoroundecanoic acid (PFUnDA)	µg/L	0.01	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0
Perfluorododecanoic acid (PFDoDA)	µg/L	0.01	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0
Perfluorotridecanoic acid (PFTrDA)	µg/L	0.01	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0
Perfluorotetradecanoic acid (PFTeDA)	µg/L	0.01	<0.05	<0.01	0	<0.05	<0.05	0	<0.05	<0.01	0	<0.05	<0.05	0	<0.05	<0.01	0
PFAS - (n:2) Fluorotelomer Sulfonic Acids																	
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	µg/L	0.01	<0.05	<0.01	0	<0.05	<0.05	0	<0.05	<0.01	0	<0.05	<0.05	0	<0.05	<0.01	0
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	µg/L	0.05	0.81	0.91	12	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	µg/L	0.01	<0.05	<0.01	0	<0.05	<0.05	0	<0.05	<0.01	0	<0.05	<0.05	0	<0.05	<0.01	0
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	µg/L	0.01	<0.05	<0.01	0	<0.05	<0.05	0	<0.05	<0.01	0	<0.05	<0.05	0	<0.05	<0.01	0
PFAS - Perfluoroalkyl Sulfonamides																	
Perfluorooctane sulfonamide (FOSA)	µg/L	0.02	<0.02	<0.05	0	<0.02	<0.02	0	<0.02	<0.05	0	<0.02	<0.02	0	<0.02	<0.05	0
N-Methyl perfluorooctane sulfonamide (MeFOSA)	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
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	µg/L	0.02	<0.02	<0.05	0	<0.02	<0.02	0	<0.02	<0.05	0	<0.02	<0.02	0	<0.02	<0.05	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
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	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
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	µg/L	0.02	<0.02	<0.05	0	<0.02	<0.02	0	<0.02	<0.05	0	<0.02	<0.02	0	<0.02	<0.05	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
PFAS																	
Sum of PFHxS and PFOS	µg/L	0.01	0.67	1.1	49	<0.01	<0.01	0	<0.01	0.03	100	0.79	0.19	122	0.79	0.51	43
Sum of PFAS (WA DER List)	µg/L	0.01	19.0	15.9	18	<0.01	<0.01	0	<0.01	0.15	175	0.81	0.19	124	0.81	0.58	33
Sum of PFAS	µg/L	0.01	19.3	16.46	16	<0.01	<0.01	0	<0.01	0.15	175	0.81	0.19	124	0.81	0.58	33

B3 - water samples Relative Percentage Differences (RPD)

			Date	12 Mar 2024	12 Mar 2024		12 Mar 2024	12 Mar 2024		12 Mar 2024	12 Mar 2024		12 Mar 2024	12 Mar 2024		12 Mar 2024	12 Mar 2024	
			Field ID	0089_PW304_240312	0089_QC111_240312		0089_PW304_240312	0089_QC211_240312		0089_MW240_240312	0089_QC116_240312		0089_MW240_240312	0089_QC216_240312		0089_MW225_240312	0089_QC118_240312	
			Matrix Type	Water	Water		Water	Water		Water	Water		Water	Water		Water	Water	
			Lab Report Number	EP2403250	EP2403250	RPD	EP2403250	1078840	RPD	EP2403218	EP2403218	RPD	EP2403218	1078840	RPD	EP2403226	EP2403226	RPD
	Unit	LOR																
PFAS - Perfluoroalkyl Sulfonic Acids																		
Perfluorobutane sulfonic acid (PFBS)	µg/L	0.01		<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0
Perfluoropentane sulfonic acid (PFPeS)	µg/L	0.01		<0.02	<0.02	0	<0.02	<0.01	0	0.06	0.06	0	0.06	<0.01	143	<0.02	<0.02	0
Perfluorohexane sulfonic acid (PFHxS)	µg/L	0.01		<0.01	<0.01	0	<0.01	0.03	100	1.72	1.80	5	1.72	0.22	**155**	<0.01	<0.01	0
Perfluoroheptane sulfonic acid (PFHpS)	µg/L	0.01		<0.02	<0.02	0	<0.02	<0.01	0	0.04	0.04	0	0.04	<0.01	120	<0.02	<0.02	0
Perfluorooctane sulfonic acid (PFOS)	µg/L	0.01		0.04	0.05	22	0.04	0.09	77	<0.01	<0.01	0	<0.01	<0.01	0	<0.01	<0.01	0
Perfluorodecane sulfonic acid (PFDS)	µg/L	0.01		<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0
PFAS - Perfluoroalkyl Carboxylic Acids																		
Perfluorobutanoic acid (PFBA)	µg/L	0.05		<0.1	<0.1	0	<0.1	<0.05	0	<0.1	<0.1	0	<0.1	<0.05	0	<0.1	<0.1	0
Perfluoropentanoic acid (PFPeA)	µg/L	0.01		<0.02	<0.02	0	<0.02	0.02	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0
Perfluorohexanoic acid (PFHxA)	µg/L	0.01		<0.02	<0.02	0	<0.02	0.03	40	0.07	0.07	0	0.07	<0.01	150	<0.02	<0.02	0
Perfluoroheptanoic acid (PFHpA)	µg/L	0.02		<0.02	<0.02	0	<0.02	<0.05	0	0.02	0.02	0	0.02	<0.05	0	<0.02	<0.02	0
Perfluorooctanoic acid (PFOA)	µg/L	0.01		<0.01	<0.01	0	<0.01	<0.01	0	0.06	0.07	15	0.06	<0.01	143	<0.01	<0.01	0
Perfluorononanoic acid (PFNA)	µg/L	0.01		<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0
Perfluorodecanoic acid (PFDA)	µg/L	0.01		<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0
Perfluoroundecanoic acid (PFUnDA)	µg/L	0.01		<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0
Perfluorododecanoic acid (PFDoDA)	µg/L	0.01		<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0
Perfluorotridecanoic acid (PFTrDA)	µg/L	0.01		<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0
Perfluorotetradecanoic acid (PFTeDA)	µg/L	0.01		<0.05	<0.05	0	<0.05	<0.01	0	<0.05	<0.05	0	<0.05	<0.01	0	<0.05	<0.05	0
PFAS - (n:2) Fluorotelomer Sulfonic Acids																		
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	µg/L	0.01		<0.05	<0.05	0	<0.05	<0.01	0	<0.05	<0.05	0	<0.05	<0.01	0	<0.05	<0.05	0
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	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
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	µg/L	0.01		<0.05	<0.05	0	<0.05	<0.01	0	<0.05	<0.05	0	<0.05	<0.01	0	<0.05	<0.05	0
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	µg/L	0.01		<0.05	<0.05	0	<0.05	<0.01	0	<0.05	<0.05	0	<0.05	<0.01	0	<0.05	<0.05	0
PFAS - Perfluoroalkyl Sulfonamides																		
Perfluorooctane sulfonamide (FOSA)	µg/L	0.02		<0.02	<0.02	0	<0.02	<0.05	0	<0.02	<0.02	0	<0.02	<0.05	0	<0.02	<0.02	0
N-Methyl perfluorooctane sulfonamide (MeFOSA)	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
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	µg/L	0.02		<0.02	<0.02	0	<0.02	<0.05	0	<0.02	<0.02	0	<0.02	<0.05	0	<0.02	<0.02	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
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	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
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	µg/L	0.02		<0.02	<0.02	0	<0.02	<0.05	0	<0.02	<0.02	0	<0.02	<0.05	0	<0.02	<0.02	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
PFAS																		
Sum of PFHxS and PFOS	µg/L	0.01		0.04	0.05	22	0.04	0.12	**100**	1.72	1.80	5	1.72	0.22	**155**	<0.01	<0.01	0
Sum of PFAS (WA DER List)	µg/L	0.01		0.04	0.05	22	0.04	0.17	124	1.87	1.96	5	1.87	0.22	**158**	<0.01	<0.01	0
Sum of PFAS	µg/L	0.01		0.04	0.05	22	0.04	0.17	124	1.97	2.06	4	1.97	0.22	**160**	<0.01	<0.01	0

	Date		12 Mar 2024	12 Mar 2024		12 Mar 2024	12 Mar 2024		12 Mar 2024	12 Mar 2024	
	Field ID		0089_MW225_240312	0089_QC218_240312		0089_MW242_240312	0089_QC117_240312		0089_MW242_240312	0089_QC217_240312	
	Matrix Type		Water	Water		Water	Water		Water	Water	
	Lab Report Number		EP2403226	1078840	RPD	EP2403218	EP2403218	RPD	EP2403218	1078840	RPD
	Unit	LOR									
PFAS - Perfluoroalkyl Sulfonic Acids											
Perfluorobutane sulfonic acid (PFBS)	µg/L	0.01	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0
Perfluoropentane sulfonic acid (PFPeS)	µg/L	0.01	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<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
Perfluoroheptane sulfonic acid (PFHpS)	µg/L	0.01	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0
Perfluorooctane sulfonic acid (PFOS)	µg/L	0.01	<0.01	<0.01	0	0.01	0.01	0	0.01	<0.01	0
Perfluorodecane sulfonic acid (PFDS)	µg/L	0.01	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0
PFAS - Perfluoroalkyl Carboxylic Acids											
Perfluorobutanoic acid (PFBA)	µg/L	0.05	<0.1	<0.05	0	<0.1	<0.1	0	<0.1	<0.05	0
Perfluoropentanoic acid (PFPeA)	µg/L	0.01	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0
Perfluorohexanoic acid (PFHxA)	µg/L	0.01	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0
Perfluoroheptanoic acid (PFHpA)	µg/L	0.02	<0.02	<0.05	0	<0.02	<0.02	0	<0.02	<0.05	0
Perfluorooctanoic acid (PFOA)	µg/L	0.01	<0.01	<0.01	0	<0.01	<0.01	0	<0.01	<0.01	0
Perfluorononanoic acid (PFNA)	µg/L	0.01	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0
Perfluorodecanoic acid (PFDA)	µg/L	0.01	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0
Perfluoroundecanoic acid (PFUnDA)	µg/L	0.01	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0
Perfluorododecanoic acid (PFDoDA)	µg/L	0.01	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0
Perfluorotridecanoic acid (PFTrDA)	µg/L	0.01	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0
Perfluorotetradecanoic acid (PFTeDA)	µg/L	0.01	<0.05	<0.01	0	<0.05	<0.05	0	<0.05	<0.01	0
PFAS - (n:2) Fluorotelomer Sulfonic Acids											
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	µg/L	0.01	<0.05	<0.01	0	<0.05	<0.05	0	<0.05	<0.01	0
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	µg/L	0.05	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	µg/L	0.01	<0.05	<0.01	0	<0.05	<0.05	0	<0.05	<0.01	0
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	µg/L	0.01	<0.05	<0.01	0	<0.05	<0.05	0	<0.05	<0.01	0
PFAS - Perfluoroalkyl Sulfonamides											
Perfluorooctane sulfonamide (FOSA)	µg/L	0.02	<0.02	<0.05	0	<0.02	<0.02	0	<0.02	<0.05	0
N-Methyl perfluorooctane sulfonamide (MeFOSA)	µg/L	0.05	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	µg/L	0.02	<0.02	<0.05	0	<0.02	<0.02	0	<0.02	<0.05	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
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	µg/L	0.05	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	µg/L	0.02	<0.02	<0.05	0	<0.02	<0.02	0	<0.02	<0.05	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
PFAS											
Sum of PFHxS and PFOS	µg/L	0.01	<0.01	<0.01	0	0.01	0.01	0	0.01	<0.01	0
Sum of PFAS (WA DER List)	µg/L	0.01	<0.01	<0.05	0	0.01	0.01	0	0.01	<0.05	0
Sum of PFAS	µg/L	0.01	<0.01	<0.1	0	0.01	0.01	0	0.01	<0.1	0

		Date	11 Mar 2024	11 Mar 2024		11 Mar 2024	11 Mar 2024		11 Mar 2024	11 Mar 2024		11 Mar 2024	11 Mar 2024		12 Mar 2024	12 Mar 2024
		Field ID	0089_SD315_240311	0089_QC106_240311		0089_SD315_240311	0089_QC206_240311		0089_SD358_240311	0089_QC108_240311		0089_SD358_240311	0089_QC208_240311		0089_SD405_240312	0089_QC115_240312
		Matrix Type	Soil	Soil		Soil	Soil		Soil	Soil		Soil	Soil		Soil	Soil
		Lab Report Number	EP2403148	EP2403148	RPD	EP2403148	1078840	RPD	EP2403150	EP2403150	RPD	EP2403150	1078840	RPD	EP2403225	EP2403225
	Unit	LOR														
PFAS - Perfluoroalkyl Sulfonic Acids																
Perfluorobutane sulfonic acid (PFBS)	mg/kg	0.0002	<0.0002	<0.0002	0	<0.0002	<0.005	0	<0.0002	<0.0002	0	<0.0002	<0.005	0	<0.0002	<0.0002
Perfluoropentane sulfonic acid (PFPeS)	mg/kg	0.0002	<0.0002	<0.0002	0	<0.0002	<0.005	0	<0.0002	<0.0002	0	<0.0002	<0.005	0	<0.0002	<0.0002
Perfluorohexane sulfonic acid (PFHxS)	mg/kg	0.0002	<0.0002	<0.0002	0	<0.0002	<0.005	0	<0.0002	<0.0002	0	<0.0002	<0.005	0	<0.0002	<0.0002
Perfluoroheptane sulfonic acid (PFHpS)	mg/kg	0.0002	<0.0002	<0.0002	0	<0.0002	<0.005	0	<0.0002	<0.0002	0	<0.0002	<0.005	0	<0.0002	<0.0002
Perfluorooctane sulfonic acid (PFOS)	mg/kg	0.0002	<0.0002	<0.0002	0	<0.0002	<0.005	0	<0.0002	<0.0002	0	<0.0002	<0.005	0	<0.0002	<0.0002
Perfluorodecane sulfonic acid (PFDS)	mg/kg	0.0002	<0.0002	<0.0002	0	<0.0002	<0.005	0	<0.0002	<0.0002	0	<0.0002	<0.005	0	<0.0002	<0.0002
PFAS - Perfluoroalkyl Carboxylic Acids																
Perfluorobutanoic acid (PFBA)	mg/kg	0.001	<0.001	<0.001	0	<0.001	<0.005	0	<0.001	<0.001	0	<0.001	<0.005	0	<0.001	<0.001
Perfluoropentanoic acid (PFPeA)	mg/kg	0.0002	<0.0002	<0.0002	0	<0.0002	<0.005	0	<0.0002	<0.0002	0	<0.0002	<0.005	0	<0.0002	<0.0002
Perfluorohexanoic acid (PFHxA)	mg/kg	0.0002	<0.0002	<0.0002	0	<0.0002	<0.005	0	<0.0002	<0.0002	0	<0.0002	<0.005	0	<0.0002	<0.0002
Perfluoroheptanoic acid (PFHpA)	mg/kg	0.0002	<0.0002	<0.0002	0	<0.0002	<0.005	0	<0.0002	<0.0002	0	<0.0002	<0.005	0	<0.0002	<0.0002
Perfluorooctanoic acid (PFOA)	mg/kg	0.0002	<0.0002	<0.0002	0	<0.0002	<0.005	0	<0.0002	<0.0002	0	<0.0002	<0.005	0	<0.0002	<0.0002
Perfluorononanoic acid (PFNA)	mg/kg	0.0002	<0.0002	<0.0002	0	<0.0002	<0.005	0	<0.0002	<0.0002	0	<0.0002	<0.005	0	<0.0002	<0.0002
Perfluorodecanoic acid (PFDA)	mg/kg	0.0002	<0.0002	<0.0002	0	<0.0002	<0.005	0	<0.0002	<0.0002	0	<0.0002	<0.005	0	<0.0002	<0.0002
Perfluoroundecanoic acid (PFUnDA)	mg/kg	0.0002	<0.0002	<0.0002	0	<0.0002	<0.005	0	<0.0002	<0.0002	0	<0.0002	<0.005	0	<0.0002	<0.0002
Perfluorododecanoic acid (PFDoDA)	mg/kg	0.0002	<0.0002	<0.0002	0	<0.0002	<0.005	0	<0.0002	<0.0002	0	<0.0002	<0.005	0	<0.0002	<0.0002
Perfluorotridecanoic acid (PFTrDA)	mg/kg	0.0002	<0.0002	<0.0002	0	<0.0002	<0.005	0	<0.0002	<0.0002	0	<0.0002	<0.005	0	<0.0002	<0.0002
Perfluorotetradecanoic acid (PFTeDA)	mg/kg	0.0005	<0.0005	<0.0005	0	<0.0005	<0.005	0	<0.0005	<0.0005	0	<0.0005	<0.005	0	<0.0005	<0.0005
PFAS - (n:2) Fluorotelomer Sulfonic Acids																
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	mg/kg	0.0005	<0.0005	<0.0005	0	<0.0005	<0.005	0	<0.0005	<0.0005	0	<0.0005	<0.005	0	<0.0005	<0.0005
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	mg/kg	0.0005	<0.0005	<0.0005	0	<0.0005	<0.01	0	<0.0005	<0.0005	0	<0.0005	<0.01	0	<0.0005	<0.0005
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	mg/kg	0.0005	<0.0005	<0.0005	0	<0.0005	<0.005	0	<0.0005	<0.0005	0	<0.0005	<0.005	0	<0.0005	<0.0005
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	mg/kg	0.0005	<0.0005	<0.0005	0	<0.0005	<0.005	0	<0.0005	<0.0005	0	<0.0005	<0.005	0	<0.0005	<0.0005
PFAS - Perfluoroalkyl Sulfonamides																
Perfluorooctane sulfonamide (FOSA)	mg/kg	0.0002	<0.0002	<0.0002	0	<0.0002	<0.005	0	<0.0002	<0.0002	0	<0.0002	<0.005	0	<0.0002	<0.0002
N-Methyl perfluorooctane sulfonamide (MeFOSA)	mg/kg	0.0005	<0.0005	<0.0005	0	<0.0005	<0.005	0	<0.0005	<0.0005	0	<0.0005	<0.005	0	<0.0005	<0.0005
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	mg/kg	0.0002	<0.0002	<0.0002	0	<0.0002	<0.01	0	<0.0002	<0.0002	0	<0.0002	<0.01	0	<0.0002	<0.0002
N-methyl perfluorooctane sulfonamidoethanol (MeFOSE)	mg/kg	0.0005	<0.0005	<0.0005	0	<0.0005	<0.005	0	<0.0005	<0.0005	0	<0.0005	<0.005	0	<0.0005	<0.0005
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	mg/kg	0.0005	<0.0005	<0.0005	0	<0.0005	<0.005	0	<0.0005	<0.0005	0	<0.0005	<0.005	0	<0.0005	<0.0005
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	mg/kg	0.0002	<0.0002	<0.0002	0	<0.0002	<0.01	0	<0.0002	<0.0002	0	<0.0002	<0.01	0	<0.0002	<0.0002
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	mg/kg	0.0005	<0.0005	<0.0005	0	<0.0005	<0.005	0	<0.0005	<0.0005	0	<0.0005	<0.005	0	<0.0005	<0.0005
PFAS																
Sum of PFHxS and PFOS	mg/kg	0.0002	<0.0002	<0.0002	0	<0.0002	<0.005	0	<0.0002	<0.0002	0	<0.0002	<0.005	0	<0.0002	<0.0002
Sum of PFAS (WA DER List)	mg/kg	0.0002	<0.0002	<0.0002	0	<0.0002	<0.01	0	<0.0002	<0.0002	0	<0.0002	<0.01	0	<0.0002	<0.0002
Sum of PFAS	mg/kg	0.0002	<0.0002	<0.0002	0	<0.0002	<0.05	0	<0.0002	<0.0002	0	<0.0002	<0.05	0	<0.0002	<0.0002

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

B4 - Sediment RPDs

		Date		12 Mar 2024	12 Mar 2024		12 Mar 2024	12 Mar 2024		12 Mar 2024	12 Mar 2024	
		Field ID		0089_SD405_240312	0089_QC215_240312		0089_SD304_240312	0089_QC110_240312		0089_SD304_240312	0089_QC210_240312	
		Matrix Type		Soil	Soil		Soil	Soil		Soil	Soil	
		Lab Report Number	RPD	EP2403225	1078840	RPD	EP2403217	EP2403217	RPD	EP2403217	1078840	RPD
	Unit	LOR										
PFAS - Perfluoroalkyl Sulfonic Acids												
Perfluorobutane sulfonic acid (PFBS)	mg/kg	0.0002	0	<0.0002	<0.005	0	<0.0002	<0.0002	0	<0.0002	<0.005	0
Perfluoropentane sulfonic acid (PFPeS)	mg/kg	0.0002	0	<0.0002	<0.005	0	<0.0002	<0.0002	0	<0.0002	<0.005	0
Perfluorohexane sulfonic acid (PFHxS)	mg/kg	0.0002	0	<0.0002	<0.005	0	<0.0002	<0.0002	0	<0.0002	<0.005	0
Perfluoroheptane sulfonic acid (PFHpS)	mg/kg	0.0002	0	<0.0002	<0.005	0	<0.0002	<0.0002	0	<0.0002	<0.005	0
Perfluorooctane sulfonic acid (PFOS)	mg/kg	0.0002	0	<0.0002	<0.005	0	<0.0002	0.0002	0	<0.0002	<0.005	0
Perfluorodecane sulfonic acid (PFDS)	mg/kg	0.0002	0	<0.0002	<0.005	0	<0.0002	<0.0002	0	<0.0002	<0.005	0
PFAS - Perfluoroalkyl Carboxylic Acids												
Perfluorobutanoic acid (PFBA)	mg/kg	0.001	0	<0.001	<0.005	0	<0.001	<0.001	0	<0.001	<0.005	0
Perfluoropentanoic acid (PFPeA)	mg/kg	0.0002	0	<0.0002	<0.005	0	<0.0002	<0.0002	0	<0.0002	<0.005	0
Perfluorohexanoic acid (PFHxA)	mg/kg	0.0002	0	<0.0002	<0.005	0	<0.0002	<0.0002	0	<0.0002	<0.005	0
Perfluoroheptanoic acid (PFHpA)	mg/kg	0.0002	0	<0.0002	<0.005	0	<0.0002	<0.0002	0	<0.0002	<0.005	0
Perfluorooctanoic acid (PFOA)	mg/kg	0.0002	0	<0.0002	<0.005	0	<0.0002	<0.0002	0	<0.0002	<0.005	0
Perfluorononanoic acid (PFNA)	mg/kg	0.0002	0	<0.0002	<0.005	0	<0.0002	<0.0002	0	<0.0002	<0.005	0
Perfluorodecanoic acid (PFDA)	mg/kg	0.0002	0	<0.0002	<0.005	0	<0.0002	<0.0002	0	<0.0002	<0.005	0
Perfluoroundecanoic acid (PFUnDA)	mg/kg	0.0002	0	<0.0002	<0.005	0	<0.0002	<0.0002	0	<0.0002	<0.005	0
Perfluorododecanoic acid (PFDoDA)	mg/kg	0.0002	0	<0.0002	<0.005	0	<0.0002	<0.0002	0	<0.0002	<0.005	0
Perfluorotridecanoic acid (PFTrDA)	mg/kg	0.0002	0	<0.0002	<0.005	0	<0.0002	<0.0002	0	<0.0002	<0.005	0
Perfluorotetradecanoic acid (PFTeDA)	mg/kg	0.0005	0	<0.0005	<0.005	0	<0.0005	<0.0005	0	<0.0005	<0.005	0
PFAS - (n:2) Fluorotelomer Sulfonic Acids												
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	mg/kg	0.0005	0	<0.0005	<0.005	0	<0.0005	<0.0005	0	<0.0005	<0.005	0
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	mg/kg	0.0005	0	<0.0005	<0.01	0	<0.0005	<0.0005	0	<0.0005	<0.01	0
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	mg/kg	0.0005	0	<0.0005	<0.005	0	<0.0005	<0.0005	0	<0.0005	<0.005	0
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	mg/kg	0.0005	0	<0.0005	<0.005	0	<0.0005	<0.0005	0	<0.0005	<0.005	0
PFAS - Perfluoroalkyl Sulfonamides												
Perfluorooctane sulfonamide (FOSA)	mg/kg	0.0002	0	<0.0002	<0.005	0	<0.0002	<0.0002	0	<0.0002	<0.005	0
N-Methyl perfluorooctane sulfonamide (MeFOSA)	mg/kg	0.0005	0	<0.0005	<0.005	0	<0.0005	<0.0005	0	<0.0005	<0.005	0
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	mg/kg	0.0002	0	<0.0002	<0.01	0	<0.0002	<0.0002	0	<0.0002	<0.01	0
N-methyl perfluorooctane sulfonamidoethanol (MeFOSE)	mg/kg	0.0005	0	<0.0005	<0.005	0	<0.0005	<0.0005	0	<0.0005	<0.005	0
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	mg/kg	0.0005	0	<0.0005	<0.005	0	<0.0005	<0.0005	0	<0.0005	<0.005	0
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	mg/kg	0.0002	0	<0.0002	<0.01	0	<0.0002	<0.0002	0	<0.0002	<0.01	0
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	mg/kg	0.0005	0	<0.0005	<0.005	0	<0.0005	<0.0005	0	<0.0005	<0.005	0
PFAS												
Sum of PFHxS and PFOS	mg/kg	0.0002	0	<0.0002	<0.005	0	<0.0002	0.0002	0	<0.0002	<0.005	0
Sum of PFAS (WA DER List)	mg/kg	0.0002	0	<0.0002	<0.01	0	<0.0002	0.0002	0	<0.0002	<0.01	0
Sum of PFAS	mg/kg	0.0002	0	<0.0002	<0.05	0	<0.0002	0.0002	0	<0.0002	<0.05	0

APPENDIX

C

LABORATORY CERTIFICATES

Cardno

now

Stantec

CHAIN OF CUSTODY

COC#: 64886 ALS Laboratory: EP Perth Environmental

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	[redacted] DATE TIME: 12/3 1145	DATE TIME:	DATE TIME:

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP_24

SITE: Stirling GW - JS

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted]

QUOTE NO: SY/139/19 B

SAMPLER MOBILE: [redacted] / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES 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	WA OMP Water Suite WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
001	0089_MW289		11/03/2024 09:28 AM	WATER	ALS: 3 Non ALS: 0	No	X		
002	0089_QC101		11/03/2024 09:28 AM	WATER	ALS: 3 Non ALS: 0	No	X		
003	0089_MW124		11/03/2024 10:26 AM	WATER	ALS: 3 Non ALS: 0	No	X		
004	0089_MW127		11/03/2024 11:25 AM	WATER	ALS: 3 Non ALS: 0	No	X		
005	0089_MW126		11/03/2024 11:32 AM	WATER	ALS: 3 Non ALS: 0	No	X		
006	0089_MW125		11/03/2024 11:33 AM	WATER	ALS: 5 Non ALS: 0	No	X		
007	0089_MW123		11/03/2024 01:47 PM	WATER	ALS: 3 Non ALS: 0	No	X		

Environmental Division Perth

Work Order Reference

EP2403138

Telephone : +61-8-9406 1301

CHAIN OF CUSTODY

COC#: 64886 *ALS Laboratory:* EP Perth Environmental

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP_24

SITE: Stirling GW - JS

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted]

QUOTE NO: SY/139/19 B

SAMPLER MOBILE: [redacted] / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO: [redacted]

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

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	WA OMP Water Suite WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
008	0089_QC109		11/03/2024 01:48 PM	WATER	ALS: 3 Non ALS: 0	No	X		
009	0089_MW121		11/03/2024 02:05 PM	WATER	ALS: 3 Non ALS: 0	No	X		
010	0089_MW120		11/03/2024 02:15 PM	WATER	ALS: 5 Non ALS: 0	No	X		
011	0089_MW112		11/03/2024 02:26 PM	WATER	ALS: 3 Non ALS: 0	No	X		
012	0089_MW109		11/03/2024 02:36 PM	WATER	ALS: 5 Non ALS: 0	No	X		
013	0089_MW500		11/03/2024 02:52 PM	WATER	ALS: 5 Non ALS: 0	No	X		

CHAIN OF CUSTODY

ALS COC#: 64886 ALS Laboratory: EP Perth Environmental

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP_24

SITE: Stirling GW - JS

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER:

CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO:

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

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	0089_MW289	Clear Plastic Bottle - Natural	125 mL	00070821217571	Green	No	
001	0089_MW289	HDPE (no PTFE)	20 mL	00352309065741	Grey	No	
001	0089_MW289	HDPE (no PTFE)	20 mL	00352309066027	Grey	No	
002	0089_QC101	Clear Plastic Bottle - Natural	125 mL	00070821217437	Green	No	
002	0089_QC101	HDPE (no PTFE)	20 mL	00352309065916	Grey	No	
002	0089_QC101	HDPE (no PTFE)	20 mL	00352309065782	Grey	No	
003	0089_MW124	Clear Plastic Bottle - Natural	125 mL	00070821217460	Green	No	
003	0089_MW124	HDPE (no PTFE)	20 mL	00352309065885	Grey	No	
003	0089_MW124	HDPE (no PTFE)	20 mL	00352309065862	Grey	No	
004	0089_MW127	Clear Plastic Bottle - Natural	125 mL	00070821217316	Green	No	
004	0089_MW127	HDPE (no PTFE)	20 mL	00352309065808	Grey	No	
004	0089_MW127	HDPE (no PTFE)	20 mL	00352309065796	Grey	No	
005	0089_MW126	HDPE (no PTFE)	20 mL	00352309065751	Grey	No	
005	0089_MW126	Clear Plastic Bottle - Natural	125 mL	00070821217399	Green	No	
005	0089_MW126	HDPE (no PTFE)	20 mL	00352309065848	Grey	No	
006	0089_MW125	Clear Plastic Bottle - Natural	125 mL	00070821217400	Green	No	
006	0089_MW125	HDPE (no PTFE)	20 mL	00352309065776	Grey	No	
006	0089_MW125	HDPE (no PTFE)	20 mL	00352309065878	Grey	No	
006	0089_MW125	HDPE (no PTFE)	20 mL	00350822059002	Grey	No	
006	0089_MW125	HDPE (no PTFE)	20 mL	00350822058895	Grey	No	
007	0089_MW123	Clear Plastic Bottle - Natural	125 mL	00070821217473	Green	No	
007	0089_MW123	HDPE (no PTFE)	20 mL	00352309065956	Grey	No	
007	0089_MW123	HDPE (no PTFE)	20 mL	00352309065863	Grey	No	
008	0089_QC109	Clear Plastic Bottle - Natural	125 mL	00070821217339	Green	No	
008	0089_QC109	HDPE (no PTFE)	20 mL	00352309065847	Grey	No	
008	0089_QC109	HDPE (no PTFE)	20 mL	00352309065767	Grey	No	

CHAIN OF CUSTODY

ALS COC#: 64886 ALS Laboratory: EP Perth Environmental

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP_24

SITE: Stirling GW - JS

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO: [redacted]

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

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:

009	0089_MW121	Clear Plastic Bottle - Natural	125 mL	00070821217408	Green	No	
009	0089_MW121	HDPE (no PTFE)	20 mL	00352309065844	Grey	No	
009	0089_MW121	HDPE (no PTFE)	20 mL	00352309065877	Grey	No	
010	0089_MW120	HDPE (no PTFE)	20 mL	00350822058742	Grey	No	
010	0089_MW120	HDPE (no PTFE)	20 mL	00350822058873	Grey	No	
010	0089_MW120	Clear Plastic Bottle - Natural	125 mL	00070821217453	Green	No	
010	0089_MW120	HDPE (no PTFE)	20 mL	00352309065852	Grey	No	
010	0089_MW120	HDPE (no PTFE)	20 mL	00352309066004	Grey	No	
011	0089_MW112	Clear Plastic Bottle - Natural	125 mL	00070821217464	Green	No	
011	0089_MW112	HDPE (no PTFE)	20 mL	00352309065987	Grey	No	
011	0089_MW112	HDPE (no PTFE)	20 mL	00352309065778	Grey	No	
012	0089_MW109	HDPE (no PTFE)	20 mL	00350822058942	Grey	No	
012	0089_MW109	HDPE (no PTFE)	20 mL	00350822058851	Grey	No	
012	0089_MW109	Clear Plastic Bottle - Natural	125 mL	00070821217532	Green	No	
012	0089_MW109	HDPE (no PTFE)	20 mL	00352309065972	Grey	No	
012	0089_MW109	HDPE (no PTFE)	20 mL	00352309065779	Grey	No	
013	0089_MW500	HDPE (no PTFE)	20 mL	00350822058831	Grey	No	
013	0089_MW500	HDPE (no PTFE)	20 mL	00350822058768	Grey	No	
013	0089_MW500	Clear Plastic Bottle - Natural	125 mL	00070821217455	Green	No	
013	0089_MW500	HDPE (no PTFE)	20 mL	00352309065986	Grey	No	
013	0089_MW500	HDPE (no PTFE)	20 mL	00352309066037	Grey	No	

Total Bottle Count: ALS: 47, Non ALS: 0

SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : **EP2403138**

Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: Customer Services EP
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
E-mail	: [redacted]stantec.com	E-mail	: ALSEnviro.Perth@alsglobal.com
Telephone	: ----	Telephone	: +61-8-9406 1301
Facsimile	: ----	Facsimile	: +61-8-9406 1399
Project	: WA_0089_PFASOMP_24	Page	: 1 of 2
Order number	: pfas-omp/Stirling	Quote number	: ES2022MWHAUS0002 (SY/139/19 B)
C-O-C number	: 64886	QC Level	: NEPM 2013 B3 & ALS QC Standard
Site	: Stirling GW - JS		
Sampler	: [redacted]		

Dates

Date Samples Received	: 12-Mar-2024 11:45	Issue Date	: 14-Mar-2024
Client Requested Due Date	: 20-Mar-2024	Scheduled Reporting Date	: **20-Mar-2024**

Delivery Details

Mode of Delivery	: Carrier	Security Seal	: Not Available
No. of coolers/boxes	: 3	Temperature	: 9.5 - Ice present
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 see scanned COC for sample discrepencies: extra samples , samples not received etc.
- Please direct any queries related to sample condition / numbering / breakages to Sample Receipt (Samples.Perth@alsglobal.com)
- Analytical work for this work order will be conducted at ALS Environmental Perth.
- Please direct any turnaround / technical queries to the laboratory contact designated above.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months) from receipt of samples.
- **pH analysis should be conducted within 6 hours of sampling.**
- **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.**
- 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)	WATER - NT-01 & 02 Ca, Mg, Na, K, Cl, SO4, Alkalinity
EP2403138-001	11-Mar-2024 09:28	0089_MW289_240311	✓	✓
EP2403138-002	11-Mar-2024 09:28	0089_QC101_240311	✓	✓
EP2403138-003	11-Mar-2024 10:26	0089_MW124_240311	✓	✓
EP2403138-004	11-Mar-2024 11:25	0089_MW127_240311	✓	✓
EP2403138-005	11-Mar-2024 11:32	0089_MW126_240311	✓	✓
EP2403138-006	11-Mar-2024 11:33	0089_MW125_240311	✓	✓
EP2403138-007	11-Mar-2024 13:47	0089_MW123_240311	✓	✓
EP2403138-008	11-Mar-2024 13:48	0089_QC109_240311	✓	✓
EP2403138-009	11-Mar-2024 14:05	0089_MW121_240311	✓	✓
EP2403138-010	11-Mar-2024 14:15	0089_MW120_240311	✓	✓
EP2403138-011	11-Mar-2024 14:26	0089_MW112_240311	✓	✓
EP2403138-012	11-Mar-2024 14:36	0089_MW109_240311	✓	✓
EP2403138-013	11-Mar-2024 14:52	0089_MW500_240311	✓	✓

Proactive Holding Time Report

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

Requested Deliverables

[redacted]
- A4 - AU Tax Invoice (INV) — Email — [redacted]cardno.com.au

DERP LAB REPORTS
- EDI Format - ESDAT (ESDAT) — Email — derp.labreports@esdat.com.au

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

CERTIFICATE OF ANALYSIS

Work Order	: **EP2403138**	Page	: 1 of 12
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: Customer Services EP
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: +61-8-9406 1301
Project	: WA_0089_PFASOMP_24	Date Samples Received	: 12-Mar-2024 11:45
Order number	: pfas-omp/Stirling	Date Analysis Commenced	: 14-Mar-2024
C-O-C number	: 64886	Issue Date	: 20-Mar-2024 23:12
Sampler	: [redacted] [redacted]		
Site	: Stirling GW - JS		
Quote number	: SY/139/19 B		
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]	Inorganics Supervisor	Perth Inorganics, Wangara, WA
[redacted]	Inorganics Analyst	Perth Inorganics, Wangara, WA
[redacted]	Senior Organic Chemist	Perth Organics, Wangara, WA

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.
- As per QWI – EN55-3 Data Interpreting Procedures, Ionic balances are typically calculated using Major Anions - Chloride, Alkalinity and Sulfate; and Major Cations - Calcium, Magnesium, Potassium and Sodium. Where applicable and dependent upon sample matrix, the Ionic Balance may also include the additional contribution of Ammonia, Dissolved Metals by ICPMS and H+ to the Cations and Nitrate, SiO2 and Fluoride to the Anions.
- Sodium Adsorption Ratio (where reported): Where results for Na, Ca or Mg are <LOR, a concentration at half the reported LOR is incorporated into the SAR calculation. This represents a conservative approach for Na relative to the assumption that <LOR = zero concentration and a conservative approach for Ca & Mg relative to the assumption that <LOR is equivalent to the LOR concentration.
- 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.
- ED045G: The presence of Thiocyanate, Thiosulfate and Sulfite can positively contribute to the chloride result, thereby may bias results higher than expected. Results should be scrutinised accordingly.

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW289_240311	0089_QC101_240311	0089_MW124_240311	0089_MW127_240311	0089_MW126_240311
				Sampling date / time	11-Mar-2024 09:28	11-Mar-2024 09:28	11-Mar-2024 10:26	11-Mar-2024 11:25	11-Mar-2024 11:32
Compound	CAS Number	LOR	Unit		EP2403138-001	EP2403138-002	EP2403138-003	EP2403138-004	EP2403138-005
					Result	Result	Result	Result	Result
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	<1	<1	<1	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	<1	<1	<1	<1
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		**417**	**431**	**399**	**618**	**636**
Total Alkalinity as CaCO3	----	1	mg/L		**417**	**431**	**399**	**618**	**636**
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		**80**	**83**	**1960**	**1580**	**1510**
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		**97**	**97**	**14800**	**13900**	**12100**
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		**112**	**112**	**475**	**350**	**359**
Magnesium	7439-95-4	1	mg/L		**33**	**33**	**1200**	**1170**	**1100**
Sodium	7440-23-5	1	mg/L		**81**	**81**	**8780**	**8140**	**7500**
Potassium	7440-09-7	1	mg/L		**8**	**8**	**473**	**422**	**390**
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		**12.7**	**13.1**	**466**	**437**	**385**
ø Total Cations	----	0.01	meq/L		**12.0**	**12.0**	**516**	**479**	**445**
ø Ionic Balance	----	0.01	%		**2.83**	**4.15**	**5.11**	**4.51**	**7.13**
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		**0.03**	**0.03**	**0.03**	<0.02	<0.02
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		**0.05**	**0.05**	<0.02	<0.02	<0.02
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		**0.49**	**0.49**	<0.01	<0.01	<0.01
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		**0.03**	**0.03**	<0.02	<0.02	<0.02
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		**1.19**	**1.19**	<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

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW289_240311	0089_QC101_240311	0089_MW124_240311	0089_MW127_240311	0089_MW126_240311
				Sampling date / time	11-Mar-2024 09:28	11-Mar-2024 09:28	11-Mar-2024 10:26	11-Mar-2024 11:25	11-Mar-2024 11:32
Compound	CAS Number	LOR	Unit		EP2403138-001	EP2403138-002	EP2403138-003	EP2403138-004	EP2403138-005
					Result	Result	Result	Result	Result
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		**0.04**	**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		**0.03**	**0.03**	<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
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									

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW289_240311	0089_QC101_240311	0089_MW124_240311	0089_MW127_240311	0089_MW126_240311
				Sampling date / time	11-Mar-2024 09:28	11-Mar-2024 09:28	11-Mar-2024 10:26	11-Mar-2024 11:25	11-Mar-2024 11:32
Compound	CAS Number	LOR	Unit		EP2403138-001	EP2403138-002	EP2403138-003	EP2403138-004	EP2403138-005
					Result	Result	Result	Result	Result
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
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		**1.86**	**1.86**	**0.03**	<0.01	<0.01
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		**1.68**	**1.68**	<0.01	<0.01	<0.01
Sum of PFAS (WA DER List)	----	0.01	µg/L		**1.78**	**1.78**	**0.03**	<0.01	<0.01
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**93.5**	**96.3**	**96.9**	**100**	**94.3**
13C8-PFOA	----	0.02	%		**91.6**	**94.0**	**94.4**	**93.7**	**93.3**

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW125_240311	0089_MW123_240311	0089_QC109_240311	0089_MW121_240311	0089_MW120_240311
				Sampling date / time	11-Mar-2024 11:33	11-Mar-2024 13:47	11-Mar-2024 13:48	11-Mar-2024 14:05	11-Mar-2024 14:15
Compound	CAS Number	LOR	Unit		EP2403138-006	EP2403138-007	EP2403138-008	EP2403138-009	EP2403138-010
					Result	Result	Result	Result	Result
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	<1	<1	<1	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	<1	<1	<1	<1
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		**415**	**266**	**276**	**369**	**256**
Total Alkalinity as CaCO3	----	1	mg/L		**415**	**266**	**276**	**369**	**256**
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		**2030**	**24**	**27**	**20**	**17**
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		**15200**	**51**	**53**	**56**	**59**
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		**476**	**98**	**96**	**98**	**81**
Magnesium	7439-95-4	1	mg/L		**1240**	**18**	**17**	**16**	**18**
Sodium	7440-23-5	1	mg/L		**9210**	**33**	**32**	**36**	**34**
Potassium	7440-09-7	1	mg/L		**512**	**6**	**6**	**3**	**3**
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		**479**	**7.25**	**7.57**	**9.37**	**7.13**
ø Total Cations	----	0.01	meq/L		**540**	**7.96**	**7.73**	**7.85**	**7.08**
ø Ionic Balance	----	0.01	%		**5.91**	**4.65**	**1.07**	**8.82**	**0.38**
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		**0.13**	**0.26**	**0.25**	**0.05**	<0.02
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		**0.17**	**0.90**	**0.97**	**0.14**	**0.03**
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		**0.43**	**14.0**	**15.8**	**5.87**	**1.31**
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		<0.02	**1.11**	**1.18**	**0.55**	**0.18**
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		<0.01	**20.5**	**21.8**	**4.62**	**1.44**
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW125_240311	0089_MW123_240311	0089_QC109_240311	0089_MW121_240311	0089_MW120_240311
				Sampling date / time	11-Mar-2024 11:33	11-Mar-2024 13:47	11-Mar-2024 13:48	11-Mar-2024 14:05	11-Mar-2024 14:15
Compound	CAS Number	LOR	Unit		EP2403138-006	EP2403138-007	EP2403138-008	EP2403138-009	EP2403138-010
					Result	Result	Result	Result	Result
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**	**0.28**	**0.29**	**0.15**	<0.02
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		**0.12**	**1.68**	**1.67**	**0.40**	**0.07**
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		<0.02	**0.25**	**0.25**	**0.14**	<0.02
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		<0.01	**0.90**	**0.99**	**0.44**	**0.07**
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	**0.14**	**0.14**	<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
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									

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW125_240311	0089_MW123_240311	0089_QC109_240311	0089_MW121_240311	0089_MW120_240311
				Sampling date / time	11-Mar-2024 11:33	11-Mar-2024 13:47	11-Mar-2024 13:48	11-Mar-2024 14:05	11-Mar-2024 14:15
Compound	CAS Number	LOR	Unit		EP2403138-006	EP2403138-007	EP2403138-008	EP2403138-009	EP2403138-010
					Result	Result	Result	Result	Result
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
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	**0.13**	**0.13**	<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		**0.87**	**40.2**	**43.6**	**12.4**	**3.10**
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		**0.43**	**34.5**	**37.6**	**10.5**	**2.75**
Sum of PFAS (WA DER List)	----	0.01	µg/L		**0.70**	**38.1**	**41.3**	**11.7**	**2.89**
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**99.5**	**88.3**	**87.0**	**95.0**	**88.9**
13C8-PFOA	----	0.02	%		**97.2**	**83.9**	**94.8**	**87.9**	**92.0**

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW112_240311	0089_MW109_240311	0089_MW500_240311	----	----
				Sampling date / time	11-Mar-2024 14:26	11-Mar-2024 14:36	11-Mar-2024 14:52	----	----
Compound	CAS Number	LOR	Unit		EP2403138-011	EP2403138-012	EP2403138-013	--------	--------
					Result	Result	Result	----	----
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	<1	<1	----	----
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	<1	<1	----	----
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		236	425	453	----	----
Total Alkalinity as CaCO3	----	1	mg/L		236	425	453	----	----
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		6	36	37	----	----
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		30	212	64	----	----
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		85	110	151	----	----
Magnesium	7439-95-4	1	mg/L		9	36	18	----	----
Sodium	7440-23-5	1	mg/L		21	131	36	----	----
Potassium	7440-09-7	1	mg/L		<1	<1	4	----	----
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		5.69	15.2	11.6	----	----
ø Total Cations	----	0.01	meq/L		5.90	14.2	10.7	----	----
ø Ionic Balance	----	0.01	%		1.81	3.65	4.22	----	----
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		0.08	0.10	0.41	----	----
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		0.20	0.13	0.86	----	----
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		3.88	0.56	18.6	----	----
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		0.33	<0.02	4.04	----	----
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		26.6	0.09	50.6	----	----
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	<0.02	<0.02	----	----

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW112_240311	0089_MW109_240311	0089_MW500_240311	----	----
				Sampling date / time	11-Mar-2024 14:26	11-Mar-2024 14:36	11-Mar-2024 14:52	----	----
Compound	CAS Number	LOR	Unit		EP2403138-011	EP2403138-012	EP2403138-013	--------	--------
					Result	Result	Result	----	----
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		**0.2**	<0.1	**0.3**	----	----
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		**0.32**	<0.02	**0.50**	----	----
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		**1.11**	**0.08**	**2.68**	----	----
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		**0.46**	<0.02	**0.29**	----	----
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		**1.30**	<0.01	**1.20**	----	----
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		**0.03**	<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		**0.54**	<0.02	<0.02	----	----
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L		<0.05	<0.05	<0.05	----	----
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									

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW112_240311	0089_MW109_240311	0089_MW500_240311	----	----
				Sampling date / time	11-Mar-2024 14:26	11-Mar-2024 14:36	11-Mar-2024 14:52	----	----
Compound	CAS Number	LOR	Unit		EP2403138-011	EP2403138-012	EP2403138-013	--------	--------
					Result	Result	Result	----	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
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		**0.18**	<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		**35.2**	**0.96**	**79.5**	----	----
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		**30.5**	**0.65**	**69.2**	----	----
Sum of PFAS (WA DER List)	----	0.01	µg/L		**34.1**	**0.83**	**74.6**	----	----
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**84.3**	**99.0**	**67.3**	----	----
13C8-PFOA	----	0.02	%		**92.8**	**88.9**	**95.1**	----	----

Surrogate Control Limits

Sub-Matrix: **GROUNDWATER**		Recovery Limits (%)	
Compound	*CAS Number*	*Low*	*High*
EP231S: PFAS Surrogate			
13C4-PFOS	----	65	140
13C8-PFOA	----	71	133

QUALITY CONTROL REPORT

Work Order	: **EP2403138**	Page	: 1 of 12
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: Customer Services EP
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: +61-8-9406 1301
Project	: WA_0089_PFASOMP_24	Date Samples Received	: 12-Mar-2024
Order number	: pfas-omp/Stirling	Date Analysis Commenced	: 14-Mar-2024
C-O-C number	: 64886	Issue Date	: 20-Mar-2024
Sampler	: [redacted] [redacted]		
Site	: Stirling GW - JS		
Quote number	: SY/139/19 B		
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]	Inorganics Supervisor	Perth Inorganics, Wangara, WA
[redacted]	Inorganics Analyst	Perth Inorganics, Wangara, WA
[redacted]	Senior Organic Chemist	Perth Organics, Wangara, WA

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 (%)*
ED037P: Alkalinity by PC Titrator (QC Lot: 5662718)									
EP2403138-002	0089_QC101_240311	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	431	429	0.4	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	431	429	0.4	0% - 20%
EP2403138-012	0089_MW109_240311	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	425	426	0.0	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	425	426	0.0	0% - 20%
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QC Lot: 5662861)									
EP2403138-001	0089_MW289_240311	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	80	78	2.1	0% - 20%
EP2403138-011	0089_MW112_240311	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	6	6	0.0	No Limit
ED045G: Chloride by Discrete Analyser (QC Lot: 5662862)									
EP2403138-001	0089_MW289_240311	ED045G: Chloride	16887-00-6	1	mg/L	97	94	3.0	0% - 20%
EP2403138-011	0089_MW112_240311	ED045G: Chloride	16887-00-6	1	mg/L	30	31	0.0	0% - 20%
ED093F: Dissolved Major Cations (QC Lot: 5663095)									
EP2403138-010	0089_MW120_240311	ED093F: Calcium	7440-70-2	1	mg/L	81	81	0.0	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	18	18	0.0	0% - 50%
		ED093F: Sodium	7440-23-5	1	mg/L	34	34	0.0	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	3	3	0.0	No Limit
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 5665558)									

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: 5665558) - continued									
EP2403138-006	0089_MW125_240311	EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	0.43	0.42	0.0	0% - 20%
		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	0.13	0.12	9.5	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	0.17	0.16	8.2	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: 5665711)									
EP2403138-013	0089_MW500_240311	EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01 (0.40)*	µg/L	18.6	21.7	15.6	0% - 20%
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01 (0.40)*	µg/L	50.6	56.5	11.1	0% - 20%
		EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	0.41	0.37	9.9	0% - 20%
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	0.86	0.79	7.7	0% - 20%
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	4.04	3.98	1.7	0% - 20%
		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: 5665735)									
EP2403138-010	0089_MW120_240311	EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	1.31	1.28	2.6	0% - 20%
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	1.44	1.49	3.2	0% - 20%
		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	0.03	0.03	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	0.18	0.17	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: 5665558)									
EP2403138-006	0089_MW125_240311	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	0.12	0.12	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: 5665711)									
EP2403138-013	0089_MW500_240311	EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	1.20	0.98	19.8	0% - 20%
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	0.50	0.45	11.2	0% - 20%
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	2.68	2.52	6.1	0% - 20%
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	0.29	0.27	7.7	0% - 50%

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: 5665711) - continued									
EP2403138-013	0089_MW500_240311	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	0.3	0.2	0.0	No Limit
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 5665735)									
EP2403138-010	0089_MW120_240311	EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	0.07	0.07	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	0.07	0.07	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: 5665558)									
EP2403138-006	0089_MW125_240311	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: 5665711)									
EP2403138-013	0089_MW500_240311	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 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: 5665711) - continued									
EP2403138-013	0089_MW500_240311	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: 5665735)									
EP2403138-010	0089_MW120_240311	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: 5665558)									
EP2403138-006	0089_MW125_240311	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: 5665711)									
EP2403138-013	0089_MW500_240311	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: 5665735)									
EP2403138-010	0089_MW120_240311	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: 5665558)									
EP2403138-006	0089_MW125_240311	EP231X: Sum of PFAS	----	0.01	µg/L	0.87	0.84	3.5	0% - 20%
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	0.43	0.42	2.4	0% - 20%
		EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	0.70	0.68	2.9	0% - 20%
EP231P: PFAS Sums (QC Lot: 5665711)									
EP2403138-013	0089_MW500_240311	EP231X: Sum of PFAS	----	0.01 (0.40)*	µg/L	79.5	87.8	9.9	0% - 20%
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01 (0.40)*	µg/L	69.2	78.2	12.2	0% - 20%
		EP231X: Sum of PFAS (WA DER List)	----	0.01 (0.40)*	µg/L	74.6	83.0	10.7	0% - 20%
EP231P: PFAS Sums (QC Lot: 5665735)									
EP2403138-010	0089_MW120_240311	EP231X: Sum of PFAS	----	0.01	µg/L	3.10	3.11	0.3	0% - 20%
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	2.75	2.77	0.7	0% - 20%
		EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	2.89	2.91	0.7	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
ED037P: Alkalinity by PC Titrator (QCLot: 5662718)								
ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	----	----	----	----
ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	----	----	----	----
ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	<1	----	----	----	----
ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	<1	20 mg/L	95.9	85.1	126
				<1	200 mg/L	101	90.5	111
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 5662861)								
ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<1	25 mg/L	99.0	89.9	112
				<1	500 mg/L	99.0	89.9	112
ED045G: Chloride by Discrete Analyser (QCLot: 5662862)								
ED045G: Chloride	16887-00-6	1	mg/L	<1	10 mg/L	106	88.6	113
				<1	1000 mg/L	106	88.6	113
ED093F: Dissolved Major Cations (QCLot: 5663095)								
ED093F: Calcium	7440-70-2	1	mg/L	<1	50 mg/L	101	86.5	117
ED093F: Magnesium	7439-95-4	1	mg/L	<1	50 mg/L	101	88.4	110
ED093F: Sodium	7440-23-5	1	mg/L	<1	50 mg/L	99.6	91.4	113
ED093F: Potassium	7440-09-7	1	mg/L	<1	50 mg/L	97.9	84.6	108
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5665558)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.2218 µg/L	92.6	72.0	130
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.2352 µg/L	115	71.0	127
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	0.2373 µg/L	88.7	68.0	131
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.238 µg/L	87.2	69.0	134
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.232 µg/L	91.8	65.0	140
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.241 µg/L	93.2	53.0	142
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5665711)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.2218 µg/L	92.4	72.0	130
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.2352 µg/L	88.9	71.0	127
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	0.2373 µg/L	87.9	68.0	131
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.238 µg/L	84.9	69.0	134
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.232 µg/L	104	65.0	140
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.241 µg/L	92.7	53.0	142

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
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5665735)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.2218 µg/L	93.3	72.0	130
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.2352 µg/L	84.2	71.0	127
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	0.2373 µg/L	82.8	68.0	131
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.238 µg/L	79.4	69.0	134
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.232 µg/L	89.4	65.0	140
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.241 µg/L	86.1	53.0	142
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5665558)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	1.25 µg/L	106	73.0	129
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	0.25 µg/L	87.4	72.0	129
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	0.25 µg/L	93.4	72.0	129
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	0.25 µg/L	90.8	72.0	130
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	0.25 µg/L	93.6	71.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	0.25 µg/L	92.8	69.0	130
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	0.25 µg/L	92.4	71.0	129
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	0.25 µg/L	95.6	69.0	133
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	0.25 µg/L	85.2	72.0	134
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	0.25 µg/L	89.2	65.0	144
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	0.25 µg/L	86.4	71.0	132
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5665711)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	1.25 µg/L	98.0	73.0	129
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	0.25 µg/L	92.8	72.0	129
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	0.25 µg/L	103	72.0	129
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	0.25 µg/L	92.8	72.0	130
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	0.25 µg/L	94.6	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	88.6	71.0	129
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	0.25 µg/L	89.0	69.0	133
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	0.25 µg/L	92.4	72.0	134
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	0.25 µg/L	99.2	65.0	144
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	0.25 µg/L	96.4	71.0	132
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5665735)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	1.25 µg/L	106	73.0	129
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	0.25 µg/L	91.2	72.0	129
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	0.25 µg/L	106	72.0	129

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: 5665735) - continued								
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	0.25 µg/L	89.8	72.0	130
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	0.25 µg/L	92.8	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	87.6	71.0	129
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	0.25 µg/L	92.4	69.0	133
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	0.25 µg/L	92.6	72.0	134
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	0.25 µg/L	92.2	65.0	144
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	0.25 µg/L	100	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5665558)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.25 µg/L	89.6	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	0.625 µg/L	101	68.0	141
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	0.625 µg/L	90.7	60.5	138
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	0.625 µg/L	93.3	68.3	134
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	0.625 µg/L	94.8	62.2	138
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	0.25 µg/L	96.8	65.0	136
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	0.25 µg/L	87.6	61.0	135
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5665711)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.25 µg/L	93.2	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	0.625 µg/L	116	68.0	141
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	0.625 µg/L	97.8	60.5	138
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	0.625 µg/L	97.9	68.3	134
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	0.625 µg/L	89.4	62.2	138
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	0.25 µg/L	99.6	65.0	136
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	0.25 µg/L	87.8	61.0	135
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5665735)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.25 µg/L	88.0	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	0.625 µg/L	105	68.0	141
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	0.625 µg/L	89.4	60.5	138

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
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5665735) - continued								
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	0.625 µg/L	94.0	68.3	134
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	0.625 µg/L	91.6	62.2	138
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	0.25 µg/L	109	65.0	136
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	0.25 µg/L	86.6	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5665558)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.2343 µg/L	96.2	63.0	143
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	0.2378 µg/L	96.3	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	0.24 µg/L	107	67.0	138
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	0.241 µg/L	95.2	64.2	133
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5665711)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.2343 µg/L	107	63.0	143
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	0.2378 µg/L	107	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	0.24 µg/L	110	67.0	138
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	0.241 µg/L	94.2	64.2	133
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5665735)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.2343 µg/L	98.2	63.0	143
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	0.2378 µg/L	101	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	0.24 µg/L	94.4	67.0	138
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	0.241 µg/L	81.1	64.2	133
EP231P: PFAS Sums (QCLot: 5665558)								
EP231X: Sum of PFAS	----	0.01	µg/L	<0.01	----	----	----	----
EP231X: Sum of PFHxS and PFOS	355-46-4/17 63-23-1	0.01	µg/L	<0.01	----	----	----	----
EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	<0.01	----	----	----	----
EP231P: PFAS Sums (QCLot: 5665711)								
EP231X: Sum of PFAS	----	0.01	µg/L	<0.01	----	----	----	----
EP231X: Sum of PFHxS and PFOS	355-46-4/17 63-23-1	0.01	µg/L	<0.01	----	----	----	----
EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	<0.01	----	----	----	----
EP231P: PFAS Sums (QCLot: 5665735)								
EP231X: Sum of PFAS	----	0.01	µg/L	<0.01	----	----	----	----

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	LCS: Spike Recovery (%)	Acceptable Limits (%): Low	Acceptable Limits (%): High
EP231P: PFAS Sums (QCLot: 5665735) - continued								
EP231X: Sum of PFHxS and PFOS	355-46-4/17 63-23-1	0.01	µg/L	<0.01	----	----	----	----
EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	<0.01	----	----	----	----

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
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 5662861)							
EP2403138-001	0089_MW289_240311	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	100 mg/L	105	70.4	130
ED045G: Chloride by Discrete Analyser (QCLot: 5662862)							
EP2403138-001	0089_MW289_240311	ED045G: Chloride	16887-00-6	200 mg/L	111	70.0	130
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5665735)							
EP2403138-012	0089_MW109_240311	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.2218 µg/L	91.6	72.0	129
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.232 µg/L	77.2	71.0	127
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.2352 µg/L	71.3	68.0	129
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.238 µg/L	87.4	69.0	134
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.232 µg/L	85.6	65.0	140
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.241 µg/L	87.8	53.0	129
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5665735)							
EP2403138-012	0089_MW109_240311	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	1.25 µg/L	93.8	73.0	142
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.25 µg/L	93.0	72.0	129
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.25 µg/L	105	72.0	129
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.25 µg/L	87.0	72.0	130
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.25 µg/L	94.0	71.0	133
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.25 µg/L	94.4	69.0	130
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.25 µg/L	89.8	71.0	134
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.25 µg/L	99.2	69.0	133
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.25 µg/L	97.6	72.0	134
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.25 µg/L	98.2	65.0	144
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.25 µg/L	95.6	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5665735)							
EP2403138-012	0089_MW109_240311	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.25 µg/L	93.4	59.0	135
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.625 µg/L	109	70.0	130

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: 5665735) - continued							
EP2403138-012	0089_MW109_240311	EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.625 µg/L	75.5	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.625 µg/L	99.8	70.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.625 µg/L	90.5	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.25 µg/L	99.8	65.0	136
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.25 µg/L	79.6	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5665735)							
EP2403138-012	0089_MW109_240311	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.234 µg/L	98.7	63.0	143
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.2378 µg/L	96.7	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.24 µg/L	111	67.0	138
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.2415 µg/L	91.3	70.0	130

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **EP2403138**	Page	: 1 of 6
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Telephone	: +61-8-9406 1301
Project	: WA_0089_PFASOMP_24	Date Samples Received	: 12-Mar-2024
Site	: Stirling GW - JS	Issue Date	: 20-Mar-2024
Sampler	: [redacted] [redacted]	No. of samples received	: 13
Order number	: pfas-omp/Stirling	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)						
Major Cations - Dissolved	ED093F	1	19	5.26	10.00	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)						
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	23	4.35	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			Analysis		
			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
ED037P: Alkalinity by PC Titrator								
Clear Plastic Bottle - Natural (ED037-P)								
0089_MW289_240311,	0089_QC101_240311,	**11-Mar-2024**	**----**	----	----	**15-Mar-2024**	25-Mar-2024	✓
0089_MW124_240311,	0089_MW127_240311,							
0089_MW126_240311,	0089_MW125_240311,							
0089_MW123_240311,	0089_QC109_240311,							
0089_MW121_240311,	0089_MW120_240311,							
0089_MW112_240311,	0089_MW109_240311,							
0089_MW500_240311								
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA								
Clear Plastic Bottle - Natural (ED041G)								
0089_MW289_240311,	0089_QC101_240311,	**11-Mar-2024**	**----**	----	----	**20-Mar-2024**	08-Apr-2024	✓
0089_MW124_240311,	0089_MW127_240311,							
0089_MW126_240311,	0089_MW125_240311,							
0089_MW123_240311,	0089_QC109_240311,							
0089_MW121_240311,	0089_MW120_240311,							
0089_MW112_240311,	0089_MW109_240311,							
0089_MW500_240311								

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
ED045G: Chloride by Discrete Analyser							
Clear Plastic Bottle - Natural (ED045G)							
0089_MW289_240311, 0089_QC101_240311, 0089_MW124_240311, 0089_MW127_240311, 0089_MW126_240311, 0089_MW125_240311, 0089_MW123_240311, 0089_QC109_240311, 0089_MW121_240311, 0089_MW120_240311, 0089_MW112_240311, 0089_MW109_240311, 0089_MW500_240311	**11-Mar-2024**	**----**	----	----	**20-Mar-2024**	08-Apr-2024	✓
ED093F: Dissolved Major Cations							
Clear Plastic Bottle - Natural (ED093F)							
0089_MW289_240311, 0089_QC101_240311, 0089_MW124_240311, 0089_MW127_240311, 0089_MW126_240311, 0089_MW125_240311, 0089_MW123_240311, 0089_QC109_240311, 0089_MW121_240311, 0089_MW120_240311, 0089_MW112_240311, 0089_MW109_240311, 0089_MW500_240311	**11-Mar-2024**	**----**	----	----	**15-Mar-2024**	18-Mar-2024	✓
EP231A: Perfluoroalkyl Sulfonic Acids							
HDPE (no PTFE) (EP231X)							
0089_MW289_240311, 0089_QC101_240311, 0089_MW124_240311, 0089_MW127_240311, 0089_MW126_240311, 0089_MW125_240311, 0089_MW123_240311, 0089_QC109_240311, 0089_MW121_240311, 0089_MW120_240311, 0089_MW112_240311, 0089_MW109_240311, 0089_MW500_240311	**11-Mar-2024**	**15-Mar-2024**	07-Sep-2024	✓	**15-Mar-2024**	07-Sep-2024	✓
EP231B: Perfluoroalkyl Carboxylic Acids							
HDPE (no PTFE) (EP231X)							
0089_MW289_240311, 0089_QC101_240311, 0089_MW124_240311, 0089_MW127_240311, 0089_MW126_240311, 0089_MW125_240311, 0089_MW123_240311, 0089_QC109_240311, 0089_MW121_240311, 0089_MW120_240311, 0089_MW112_240311, 0089_MW109_240311, 0089_MW500_240311	**11-Mar-2024**	**15-Mar-2024**	07-Sep-2024	✓	**15-Mar-2024**	07-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)							
0089_MW289_240311, 0089_QC101_240311, 0089_MW124_240311, 0089_MW127_240311, 0089_MW126_240311, 0089_MW125_240311, 0089_MW123_240311, 0089_QC109_240311, 0089_MW121_240311, 0089_MW120_240311, 0089_MW112_240311, 0089_MW109_240311, 0089_MW500_240311	**11-Mar-2024**	**15-Mar-2024**	07-Sep-2024	✓	**15-Mar-2024**	07-Sep-2024	✓
EP231D: (n:2) Fluorotelomer Sulfonic Acids							
HDPE (no PTFE) (EP231X)							
0089_MW289_240311, 0089_QC101_240311, 0089_MW124_240311, 0089_MW127_240311, 0089_MW126_240311, 0089_MW125_240311, 0089_MW123_240311, 0089_QC109_240311, 0089_MW121_240311, 0089_MW120_240311, 0089_MW112_240311, 0089_MW109_240311, 0089_MW500_240311	**11-Mar-2024**	**15-Mar-2024**	07-Sep-2024	✓	**15-Mar-2024**	07-Sep-2024	✓
EP231P: PFAS Sums							
HDPE (no PTFE) (EP231X)							
0089_MW289_240311, 0089_QC101_240311, 0089_MW124_240311, 0089_MW127_240311, 0089_MW126_240311, 0089_MW125_240311, 0089_MW123_240311, 0089_QC109_240311, 0089_MW121_240311, 0089_MW120_240311, 0089_MW112_240311, 0089_MW109_240311, 0089_MW500_240311	**11-Mar-2024**	**15-Mar-2024**	07-Sep-2024	✓	**15-Mar-2024**	07-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)							
Alkalinity by Auto Titrator	ED037-P	2	16	**12.50**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	1	19	**5.26**	**10.00**	×	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	3	23	**13.04**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Alkalinity by Auto Titrator	ED037-P	2	16	**12.50**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	1	19	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	3	23	**13.04**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Alkalinity by Auto Titrator	ED037-P	1	16	**6.25**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	1	19	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	3	23	**13.04**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Chloride by Discrete Analyser	ED045G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	23	**4.35**	**5.00**	×	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	20	**5.00**	**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
Alkalinity by Auto Titrator	ED037-P	WATER	In house: Referenced to APHA 2320 B This procedure determines alkalinity by automated measurement (e.g. PC Titrate) on a settled supernatant aliquot of the sample using pH 4.5 for indicating the total alkalinity end-point. This method is compliant with NEPM Schedule B(3)
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	WATER	In house: Referenced to APHA 4500-SO4. Dissolved sulfate is determined in a 0.45um filtered sample. Sulfate ions are converted to a barium sulfate suspension in an acetic acid medium with barium chloride. Light absorbance of the BaSO4 suspension is measured by a photometer and the SO4-2 concentration is determined by comparison of the reading with a standard curve. This method is compliant with NEPM Schedule B(3)
Chloride by Discrete Analyser	ED045G	WATER	In house: Referenced to APHA 4500 Cl - G.The thiocyanate ion is liberated from mercuric thiocyanate through sequestration of mercury by the chloride ion to form non-ionised mercuric chloride. In the presence of ferric ions the liberated thiocynate forms highly-coloured ferric thiocynate which is measured at 480 nm.
Major Cations - Dissolved	ED093F	WATER	In house: Referenced to APHA 3120 and 3125; USEPA SW 846 - 6010 and 6020; Cations are determined by either ICP-AES or ICP-MS techniques. This method is compliant with NEPM Schedule B(3) Sodium Adsorption Ratio is calculated from Ca, Mg and Na which determined by ALS in house method QWI-EN/ED093F. This method is compliant with NEPM Schedule B(3) Hardness parameters are calculated based on APHA 2340 B. This method is compliant with NEPM Schedule B(3)
Ionic Balance by PCT DA and Turbi SO4 DA	* EN055 - PG	WATER	In house: Referenced to APHA 1030F. This method is compliant with NEPM Schedule B(3)
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.

CHAIN OF CUSTODY

COC#: 64891 *ALS Laboratory:* EP Perth Environmental

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME: 12/3 1145	DATE TIME:	DATE TIME:

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP_24

SITE: Stirling SD - JS

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER:

CONTACT PH: [redacted]

QUOTE NO: SY/139/19 B

SAMPLER MOBILE: [redacted] / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO:

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 Sediments SEDIMENT	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
001	0089_SD335		11/03/2024 10:39 AM	SOIL	ALS: 1 Non ALS: 0	No	X		
002	0089_SD364		11/03/2024 11:04 AM	SOIL	ALS: 1 Non ALS: 0	No	X		
003	0089_SD340		11/03/2024 11:17 AM	SOIL	ALS: 1 Non ALS: 0	No	X		
004	0089_SD363		11/03/2024 11:27 AM	SOIL	ALS: 1 Non ALS: 0	No	X		
005	0089_SD341		11/03/2024 11:37 AM	SOIL	ALS: 1 Non ALS: 0	No	X		
006	0089_SD362		11/03/2024 11:38 AM	SOIL	ALS: 1 Non ALS: 0	No	X		

Environmental Division
Perth
Work Order Reference
EP2403139

Telephone : 61-8-9406 1301

CHAIN OF CUSTODY

COC#: 64891 *ALS Laboratory:* EP Perth Environmental

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

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP_24

SITE: Stirling SD - JS

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES 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	0089_SD335	HDPE Soil Jar	200 mL	00621222089078	Grey	No	
002	0089_SD364	HDPE Soil Jar	200 mL	00621222089058	Grey	No	
003	0089_SD340	HDPE Soil Jar	200 mL	00621222089132	Grey	No	
004	0089_SD363	HDPE Soil Jar	200 mL	00621222089056	Grey	No	
005	0089_SD341	HDPE Soil Jar	200 mL	00621222089029	Grey	No	
006	0089_SD362	HDPE Soil Jar	200 mL	00621222089139	Grey	No	

Total Bottle Count: ALS: 6, Non ALS: 0

SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : **EP2403139**

Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: Customer Services EP
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
E-mail	: [redacted]stantec.com	E-mail	: ALSEnviro.Perth@alsglobal.com
Telephone	: ----	Telephone	: +61-8-9406 1301
Facsimile	: ----	Facsimile	: +61-8-9406 1399
Project	: WA_0089_PFASOMP_24	Page	: 1 of 2
Order number	: pfas-omp/Stirling	Quote number	: ES2022MWHAUS0002 (SY/139/19 B)
C-O-C number	: 64891	QC Level	: NEPM 2013 B3 & ALS QC Standard
Site	: Stirling SD - JS		
Sampler	: [redacted]		

Dates

Date Samples Received	: 12-Mar-2024 11:45	Issue Date	: 14-Mar-2024
Client Requested Due Date	: 21-Mar-2024	Scheduled Reporting Date	: **21-Mar-2024**

Delivery Details

Mode of Delivery	: Carrier	Security Seal	: Not Available
No. of coolers/boxes	: 3	Temperature	: 9.5 - Ice present
Receipt Detail	:	No. of samples received / analysed	: 6 / 6

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 see scanned COC for sample discrepencies: extra samples , samples not received etc.
- Please direct any queries related to sample condition / numbering / breakages to Sample Receipt (Samples.Perth@alsglobal.com)
- Analytical work for this work order will be conducted at ALS Environmental Perth.
- Please direct any turnaround / technical queries to the laboratory contact designated above.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months) from receipt of samples.
- **pH analysis should be conducted within 6 hours of sampling.**
- **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.**
- 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: **SOIL**

Laboratory sample ID	Sampling date / time	Sample ID	SOIL - EA055-103 Moisture Content	SOIL - EP231X (solids) PFAS - Full Suite (28 analytes)
EP2403139-001	11-Mar-2024 10:39	0089_SD335_240311	✓	✓
EP2403139-002	11-Mar-2024 11:04	0089_SD364_240311	✓	✓
EP2403139-003	11-Mar-2024 11:17	0089_SD340_240311	✓	✓
EP2403139-004	11-Mar-2024 11:27	0089_SD363_240311	✓	✓
EP2403139-005	11-Mar-2024 11:37	0089_SD341_240311	✓	✓
EP2403139-006	11-Mar-2024 11:38	0089_SD362_240311	✓	✓

Proactive Holding Time Report

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

Requested Deliverables

[redacted]
- A4 - AU Tax Invoice (INV) — Email — [redacted]cardno.com.au

DERP LAB REPORTS
- *AU Certificate of Analysis - NATA (COA) — Email — derp.labreports@esdat.com.au
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI) — Email — derp.labreports@esdat.com.au
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC) — Email — derp.labreports@esdat.com.au
- A4 - AU Sample Receipt Notification - Environmental HT (SRN) — Email — derp.labreports@esdat.com.au
- Chain of Custody (CoC) (COC) — Email — derp.labreports@esdat.com.au
- EDI Format - ESDAT (ESDAT) — Email — derp.labreports@esdat.com.au
- EDI Format - XTab (XTAB) — Email — derp.labreports@esdat.com.au

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

CERTIFICATE OF ANALYSIS

Work Order	: **EP2403139**	Page	: 1 of 7
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: Customer Services EP
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: +61-8-9406 1301
Project	: WA_0089_PFASOMP_24	Date Samples Received	: 12-Mar-2024 11:45
Order number	: pfas-omp/Stirling	Date Analysis Commenced	: 14-Mar-2024
C-O-C number	: 64891	Issue Date	: 21-Mar-2024 22:56
Sampler	: [redacted] [redacted]		
Site	: Stirling SD - JS		
Quote number	: SY/139/19 B		
No. of samples received	: 6		
No. of samples analysed	: 6		

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]	Inorganics Supervisor	Perth Inorganics, Wangara, WA
[redacted]	Inorganics Analyst	Perth Inorganics, Wangara, WA
[redacted]	Senior Organic Chemist	Perth Organics, Wangara, WA

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.

- 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: SEDIMENT (Matrix: SOIL)				Sample ID	0089_SD335_240311	0089_SD364_240311	0089_SD340_240311	0089_SD363_240311	0089_SD341_240311
				Sampling date / time	11-Mar-2024 10:39	11-Mar-2024 11:04	11-Mar-2024 11:17	11-Mar-2024 11:27	11-Mar-2024 11:37
Compound	CAS Number	LOR	Unit		EP2403139-001	EP2403139-002	EP2403139-003	EP2403139-004	EP2403139-005
					Result	Result	Result	Result	Result
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content	----	0.1	%		**29.8**	**17.0**	**13.9**	**32.4**	**29.8**
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg		<0.001	<0.001	<0.001	<0.001	<0.001
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002

Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)				Sample ID	0089_SD335_240311	0089_SD364_240311	0089_SD340_240311	0089_SD363_240311	0089_SD341_240311
				Sampling date / time	11-Mar-2024 10:39	11-Mar-2024 11:04	11-Mar-2024 11:17	11-Mar-2024 11:27	11-Mar-2024 11:37
Compound	CAS Number	LOR	Unit		EP2403139-001	EP2403139-002	EP2403139-003	EP2403139-004	EP2403139-005
					Result	Result	Result	Result	Result
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
EP231P: PFAS Sums									
Sum of PFAS	----	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Sum of PFAS (WA DER List)	----	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.0002	%		**100**	**91.5**	**98.0**	**98.0**	**96.5**
13C8-PFOA	----	0.0002	%		**99.0**	**97.5**	**99.0**	**97.0**	**99.0**

Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)				Sample ID	0089_SD362_240311	----	----	----	----
				Sampling date / time	11-Mar-2024 11:38	----	----	----	----
Compound	CAS Number	LOR	Unit		EP2403139-006	--------	--------	--------	--------
					Result	----	----	----	----
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content	----	0.1	%		**29.4**	----	----	----	----
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg		<0.0002	----	----	----	----
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg		<0.0002	----	----	----	----
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg		<0.0002	----	----	----	----
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg		<0.0002	----	----	----	----
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg		<0.0002	----	----	----	----
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg		<0.0002	----	----	----	----
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg		<0.001	----	----	----	----
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg		<0.0002	----	----	----	----
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg		<0.0002	----	----	----	----
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg		<0.0002	----	----	----	----
Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg		<0.0002	----	----	----	----
Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg		<0.0002	----	----	----	----
Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg		<0.0002	----	----	----	----
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg		<0.0002	----	----	----	----
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg		<0.0002	----	----	----	----
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg		<0.0002	----	----	----	----
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg		<0.0005	----	----	----	----
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg		<0.0002	----	----	----	----

Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)				Sample ID	0089_SD362_240311	----	----	----	----
				Sampling date / time	11-Mar-2024 11:38	----	----	----	----
Compound	CAS Number	LOR	Unit		EP2403139-006	--------	--------	--------	--------
					Result	----	----	----	----
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg		<0.0005	----	----	----	----
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg		<0.0005	----	----	----	----
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg		<0.0005	----	----	----	----
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg		<0.0005	----	----	----	----
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg		<0.0002	----	----	----	----
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg		<0.0002	----	----	----	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg		<0.0005	----	----	----	----
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg		<0.0005	----	----	----	----
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg		<0.0005	----	----	----	----
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg		<0.0005	----	----	----	----
EP231P: PFAS Sums									
Sum of PFAS	----	0.0002	mg/kg		<0.0002	----	----	----	----
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg		<0.0002	----	----	----	----
Sum of PFAS (WA DER List)	----	0.0002	mg/kg		<0.0002	----	----	----	----
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.0002	%		**93.5**	----	----	----	----
13C8-PFOA	----	0.0002	%		**95.5**	----	----	----	----

Surrogate Control Limits

Sub-Matrix: **SEDIMENT**		Recovery Limits (%)	
Compound	*CAS Number*	*Low*	*High*
EP231S: PFAS Surrogate			
13C4-PFOS	----	76	136
13C8-PFOA	----	78	131

QUALITY CONTROL REPORT

Work Order	: **EP2403139**	Page	: 1 of 12
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: Customer Services EP
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: +61-8-9406 1301
Project	: WA_0089_PFASOMP_24	Date Samples Received	: 12-Mar-2024
Order number	: pfas-omp/Stirling	Date Analysis Commenced	: 14-Mar-2024
C-O-C number	: 64891	Issue Date	: 21-Mar-2024
Sampler	: [redacted] [redacted]		
Site	: Stirling SD - JS		
Quote number	: SY/139/19 B		
No. of samples received	: 6		
No. of samples analysed	: 6		

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]	Inorganics Supervisor	Perth Inorganics, Wangara, WA
[redacted]	Inorganics Analyst	Perth Inorganics, Wangara, WA
[redacted]	Senior Organic Chemist	Perth Organics, Wangara, WA

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: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
EA055: Moisture Content (Dried @ 105-110°C) (QC Lot: 5666044)									
EP2403139-001	0089_SD335_240311	EA055: Moisture Content	----	0.1	%	29.8	32.9	10.0	0% - 20%
EP2403148-005	Anonymous	EA055: Moisture Content	----	0.1	%	24.6	28.5	14.9	0% - 20%
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 5663311)									
EP2403139-001	0089_SD335_240311	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
EP2403334-003	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	0.0005	0.0005	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 5663313)									
EP2403139-005	0089_SD341_240311	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit

Sub-Matrix: **SOIL**

Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Laboratory Duplicate (DUP) Report					
				LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 5663313) - continued									
EP2403148-009	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 5663311)									
EP2403139-001	0089_SD335_240311	EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	<0.001	0.0	No Limit
EP2403334-003	Anonymous	EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	<0.001	0.0	No Limit
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 5663313)									
EP2403139-005	0089_SD341_240311	EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit

Sub-Matrix: **SOIL**

				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: 5663313) - continued									
EP2403139-005	0089_SD341_240311	EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	<0.001	0.0	No Limit
EP2403148-009	Anonymous	EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	<0.001	0.0	No Limit
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 5663311)									
EP2403139-001	0089_SD335_240311	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
EP2403334-003	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit

Sub-Matrix: **SOIL**

				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: 5663311) - continued									
EP2403334-003	Anonymous	EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 5663313)									
EP2403139-005	0089_SD341_240311	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
EP2403148-009	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 5663311)									
EP2403139-001	0089_SD335_240311	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit

Sub-Matrix: **SOIL**

				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: 5663311) - continued									
EP2403334-003	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 5663313)									
EP2403139-005	0089_SD341_240311	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
EP2403148-009	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
EP231P: PFAS Sums (QC Lot: 5663311)									
EP2403139-001	0089_SD335_240311	EP231X: Sum of PFAS	----	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Sum of PFAS (WA DER List)	----	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
EP2403334-003	Anonymous	EP231X: Sum of PFAS	----	0.0002	mg/kg	0.0005	0.0005	0.0	No Limit
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg	0.0005	0.0005	0.0	No Limit
		EP231X: Sum of PFAS (WA DER List)	----	0.0002	mg/kg	0.0005	0.0005	0.0	No Limit
EP231P: PFAS Sums (QC Lot: 5663313)									
EP2403139-005	0089_SD341_240311	EP231X: Sum of PFAS	----	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Sum of PFAS (WA DER List)	----	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
EP2403148-009	Anonymous	EP231X: Sum of PFAS	----	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231P: PFAS Sums (QC Lot: 5663313) - continued									
EP2403148-009	Anonymous	EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Sum of PFAS (WA DER List)	----	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit

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: **SOIL**

				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: 5663311)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	0.0011 mg/kg	99.5	72.0	128
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	0.00125 mg/kg	110	73.0	123
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	0.00118 mg/kg	85.6	67.0	130
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	0.00119 mg/kg	93.3	70.0	132
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	0.00116 mg/kg	92.2	68.0	136
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	0.0012 mg/kg	89.2	59.0	134
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5663313)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	0.0011 mg/kg	93.2	72.0	128
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	0.00125 mg/kg	87.6	73.0	123
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	0.00118 mg/kg	90.7	67.0	130
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	0.00119 mg/kg	88.2	70.0	132
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	0.00116 mg/kg	87.1	68.0	136
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	0.0012 mg/kg	90.8	59.0	134
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5663311)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	0.00625 mg/kg	114	71.0	135
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	0.00125 mg/kg	91.6	69.0	132
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	0.00125 mg/kg	86.4	70.0	132
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	0.00125 mg/kg	88.0	71.0	131
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	99.2	69.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	90.8	72.0	129
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	0.00125 mg/kg	90.8	69.0	133
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	100	64.0	136
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	96.0	69.0	135
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	107	66.0	139
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	0.00125 mg/kg	88.8	69.0	133
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5663313)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	0.00625 mg/kg	91.7	71.0	135
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	0.00125 mg/kg	97.2	69.0	132
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	0.00125 mg/kg	91.6	70.0	132
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	0.00125 mg/kg	89.2	71.0	131

Sub-Matrix: **SOIL**

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: 5663313) - continued								
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	94.8	69.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	101	72.0	129
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	0.00125 mg/kg	95.2	69.0	133
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	94.4	64.0	136
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	91.2	69.0	135
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	101	66.0	139
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	0.00125 mg/kg	107	69.0	133
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5663311)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	0.00125 mg/kg	87.6	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	0.00312 mg/kg	96.0	59.6	143
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	0.00312 mg/kg	83.3	62.8	140
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	0.00312 mg/kg	104	61.5	139
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	0.00312 mg/kg	97.3	61.9	139
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	0.00125 mg/kg	94.8	63.0	144
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	0.00125 mg/kg	90.4	61.0	139
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5663313)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	0.00125 mg/kg	99.2	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	0.00312 mg/kg	109	59.6	143
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	0.00312 mg/kg	80.4	62.8	140
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	0.00312 mg/kg	95.7	61.5	139
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	0.00312 mg/kg	101	61.9	139
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	0.00125 mg/kg	107	63.0	144
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	0.00125 mg/kg	90.8	61.0	139
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5663311)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	0.00117 mg/kg	99.1	62.0	145
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	0.00118 mg/kg	95.8	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	0.0012 mg/kg	94.2	65.0	137
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	0.0012 mg/kg	87.9	54.8	124

Sub-Matrix: **SOIL**

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: 5663313)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	0.00117 mg/kg	102	62.0	145
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	0.00118 mg/kg	101	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	0.0012 mg/kg	103	65.0	137
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	0.0012 mg/kg	85.4	54.8	124
EP231P: PFAS Sums (QCLot: 5663311)								
EP231X: Sum of PFAS	----	0.0002	mg/kg	<0.0002	----	----	----	----
EP231X: Sum of PFHxS and PFOS	355-46-4/17 63-23-1	0.0002	mg/kg	<0.0002	----	----	----	----
EP231X: Sum of PFAS (WA DER List)	----	0.0002	mg/kg	<0.0002	----	----	----	----
EP231P: PFAS Sums (QCLot: 5663313)								
EP231X: Sum of PFAS	----	0.0002	mg/kg	<0.0002	----	----	----	----
EP231X: Sum of PFHxS and PFOS	355-46-4/17 63-23-1	0.0002	mg/kg	<0.0002	----	----	----	----
EP231X: Sum of PFAS (WA DER List)	----	0.0002	mg/kg	<0.0002	----	----	----	----

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: **SOIL**

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: 5663311)							
EP2403139-002	0089_SD364_240311	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0011 mg/kg	96.8	72.0	128
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.00117 mg/kg	116	73.0	123
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.00118 mg/kg	90.2	67.0	130
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.00119 mg/kg	99.6	70.0	132
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.00116 mg/kg	97.4	68.0	136
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0012 mg/kg	95.3	59.0	134
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5663313)							
EP2403139-006	0089_SD362_240311	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0011 mg/kg	100.0	72.0	128
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.00117 mg/kg	88.0	73.0	123
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.00118 mg/kg	86.9	67.0	130
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.00119 mg/kg	87.0	70.0	132
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.00116 mg/kg	87.2	68.0	136
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0012 mg/kg	93.3	59.0	134
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5663311)							

Sub-Matrix: **SOIL**

				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: 5663311) - continued							
EP2403139-002	0089_SD364_240311	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.00625 mg/kg	130	71.0	135
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.00125 mg/kg	87.6	69.0	132
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.00125 mg/kg	87.9	70.0	132
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.00125 mg/kg	86.3	71.0	131
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.00125 mg/kg	98.4	69.0	133
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.00125 mg/kg	95.9	72.0	129
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.00125 mg/kg	90.8	69.0	133
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.00125 mg/kg	102	64.0	136
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.00125 mg/kg	93.6	69.0	135
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.00125 mg/kg	99.6	66.0	139
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.00125 mg/kg	96.4	69.0	133
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5663313)							
EP2403139-006	0089_SD362_240311	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.00625 mg/kg	92.2	71.0	135
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.00125 mg/kg	94.8	69.0	132
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.00125 mg/kg	92.4	70.0	132
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.00125 mg/kg	95.6	71.0	131
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.00125 mg/kg	101	69.0	133
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.00125 mg/kg	111	72.0	129
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.00125 mg/kg	92.8	69.0	133
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.00125 mg/kg	98.4	64.0	136
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.00125 mg/kg	102	69.0	135
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.00125 mg/kg	103	66.0	139
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.00125 mg/kg	102	69.0	133
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5663311)							
EP2403139-002	0089_SD364_240311	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.00125 mg/kg	94.4	48.0	128
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.00312 mg/kg	94.2	60.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.00312 mg/kg	97.1	60.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.00312 mg/kg	88.8	60.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.00312 mg/kg	102	60.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.00125 mg/kg	95.2	63.0	144
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.00125 mg/kg	91.6	61.0	139
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5663313)							
EP2403139-006	0089_SD362_240311	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.00125 mg/kg	96.0	48.0	128

Sub-Matrix: **SOIL**

				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: 5663313) - continued							
EP2403139-006	0089_SD362_240311	EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.00312 mg/kg	98.7	60.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.00312 mg/kg	94.9	60.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.00312 mg/kg	98.1	60.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.00312 mg/kg	95.4	60.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.00125 mg/kg	106	63.0	144
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.00125 mg/kg	85.2	61.0	139
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5663311)							
EP2403139-002	0089_SD364_240311	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.00117 mg/kg	105	62.0	145
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.00118 mg/kg	103	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0012 mg/kg	98.8	65.0	137
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0012 mg/kg	95.7	60.0	130
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5663313)							
EP2403139-006	0089_SD362_240311	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.00117 mg/kg	102	62.0	145
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.00118 mg/kg	108	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0012 mg/kg	107	65.0	137
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0012 mg/kg	102	60.0	130

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **EP2403139**	Page	: 1 of 5
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Telephone	: +61-8-9406 1301
Project	: WA_0089_PFASOMP_24	Date Samples Received	: 12-Mar-2024
Site	: Stirling SD - JS	Issue Date	: 21-Mar-2024
Sampler	: [redacted]	No. of samples received	: 6
Order number	: pfas-omp/Stirling	No. of samples analysed	: 6

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: **SOIL**

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
EA055: Moisture Content (Dried @ 105-110°C)							
HDPE Soil Jar (EA055)							
0089_SD335_240311, 0089_SD364_240311, 0089_SD340_240311, 0089_SD363_240311, 0089_SD341_240311, 0089_SD362_240311	**11-Mar-2024**	**----**	----	----	**15-Mar-2024**	25-Mar-2024	✓
EP231A: Perfluoroalkyl Sulfonic Acids							
HDPE Soil Jar (EP231X)							
0089_SD335_240311, 0089_SD364_240311, 0089_SD340_240311, 0089_SD363_240311	**11-Mar-2024**	**14-Mar-2024**	07-Sep-2024	✓	**14-Mar-2024**	23-Apr-2024	✓
HDPE Soil Jar (EP231X)							
0089_SD341_240311, 0089_SD362_240311	**11-Mar-2024**	**15-Mar-2024**	07-Sep-2024	✓	**15-Mar-2024**	24-Apr-2024	✓
EP231B: Perfluoroalkyl Carboxylic Acids							
HDPE Soil Jar (EP231X)							
0089_SD335_240311, 0089_SD364_240311, 0089_SD340_240311, 0089_SD363_240311	**11-Mar-2024**	**14-Mar-2024**	07-Sep-2024	✓	**14-Mar-2024**	23-Apr-2024	✓
HDPE Soil Jar (EP231X)							
0089_SD341_240311, 0089_SD362_240311	**11-Mar-2024**	**15-Mar-2024**	07-Sep-2024	✓	**15-Mar-2024**	24-Apr-2024	✓
EP231C: Perfluoroalkyl Sulfonamides							
HDPE Soil Jar (EP231X)							
0089_SD335_240311, 0089_SD364_240311, 0089_SD340_240311, 0089_SD363_240311	**11-Mar-2024**	**14-Mar-2024**	07-Sep-2024	✓	**14-Mar-2024**	23-Apr-2024	✓
HDPE Soil Jar (EP231X)							
0089_SD341_240311, 0089_SD362_240311	**11-Mar-2024**	**15-Mar-2024**	07-Sep-2024	✓	**15-Mar-2024**	24-Apr-2024	✓
EP231D: (n:2) Fluorotelomer Sulfonic Acids							
HDPE Soil Jar (EP231X)							
0089_SD335_240311, 0089_SD364_240311, 0089_SD340_240311, 0089_SD363_240311	**11-Mar-2024**	**14-Mar-2024**	07-Sep-2024	✓	**14-Mar-2024**	23-Apr-2024	✓
HDPE Soil Jar (EP231X)							
0089_SD341_240311, 0089_SD362_240311	**11-Mar-2024**	**15-Mar-2024**	07-Sep-2024	✓	**15-Mar-2024**	24-Apr-2024	✓

Matrix: **SOIL**

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 Soil Jar (EP231X) 0089_SD335_240311, 0089_SD364_240311, 0089_SD340_240311, 0089_SD363_240311	**11-Mar-2024**	**14-Mar-2024**	07-Sep-2024	✓	**14-Mar-2024**	23-Apr-2024	✓
HDPE Soil Jar (EP231X) 0089_SD341_240311, 0089_SD362_240311	**11-Mar-2024**	**15-Mar-2024**	07-Sep-2024	✓	**15-Mar-2024**	24-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: **SOIL**

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)							
Moisture Content	EA055	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	4	40	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	40	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	40	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	40	**5.00**	**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
Moisture Content	EA055	SOIL	In house: A gravimetric procedure based on weight loss over a 12 hour drying period at 105-110 degrees C. This method is compliant with NEPM Schedule B(3).
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	SOIL	In-house: Analysis of soils by solvent extraction followed by LC-Electrospray-MS-MS, Negative Mode using MRM using internal standard quantitation. Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to a portion of soil which is then extracted with MTBE and an ion pairing reagent. A portion of extract is exchanged into the analytical solvent mixture, combined with an equal volume reagent water and 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
QuECheRS Extraction of Solids	* ORG71	SOIL	In house: Sequential extractions with Acetonitrile/Methanol by shaking. Extraction efficiency aided by the addition of salts under acidic conditions. Where relevant, interferences from co-extracted organics are removed with dispersive clean-up media (dSPE). The extract is either diluted or concentrated and exchanged into the analytical solvent.

CHAIN OF CUSTODY

(ALS) COC#: 64892 ALS Laboratory: EP Perth Environmental

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME: 12/3 1145	DATE TIME:	DATE TIME:

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP_24

SITE: Stirling SW/PW - JS

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES 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	WA OMP Water Suite WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
001	0089_PW335		11/03/2024 10:40 AM	WATER	ALS: 3 Non ALS: 0	No	X		
002	0089_QC104		11/03/2024 10:40 AM	WATER	ALS: 3 Non ALS: 0	No	X		
003	0089_SW130		11/03/2024 10:41 AM	WATER	ALS: 3 Non ALS: 0	No	X		
004	0089_PW364		11/03/2024 11:04 AM	WATER	ALS: 3 Non ALS: 0	No	X		
005	0089_SW132		11/03/2024 11:15 AM	WATER	ALS: 3 Non ALS: 0	No	X		
006	0089_PW340		11/03/2024 11:16 AM	WATER	ALS: 3 Non ALS: 0	No	X		
007	0089_PW363		11/03/2024 11:26 AM	WATER	ALS: 3 Non ALS: 0	No	X		

Environmental Division Perth

Work Order Reference

EP2403140

Telephone : +61-8-9406 1301

CHAIN OF CUSTODY

(ALS) COC#: 64892 *ALS Laboratory:* EP Perth Environmental

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

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP_24

SITE: Stirling SW/PW - JS

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted]

QUOTE NO: SY/139/19 B

SAMPLER MOBILE [redacted] / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO:

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	WA OMP Water Suite WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
008	0089_SW134		11/03/2024 11:34 AM	WATER	ALS: 3 Non ALS: 0	No	X		
009	0089_PW341		11/03/2024 11:35 AM	WATER	ALS: 3 Non ALS: 0	No	X		
010	0089_PW362		11/03/2024 11:36 AM	WATER	ALS: 3 Non ALS: 0	No	X		

CHAIN OF CUSTODY

ALS COC#: 64892 ALS Laboratory: EP Perth Environmental

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP_24

SITE: Stirling SW/PW - JS

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO: [redacted]

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

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	0089_PW335	Clear Plastic Bottle - Natural	125 mL	00070821217630	Green	No	
001	0089_PW335	HDPE (no PTFE)	20 mL	00352309065896	Grey	No	
001	0089_PW335	HDPE (no PTFE)	20 mL	00352309065851	Grey	No	
002	0089_QC104	Clear Plastic Bottle - Natural	125 mL	00070821217377	Green	No	
002	0089_QC104	HDPE (no PTFE)	20 mL	00352309065950	Grey	No	
002	0089_QC104	HDPE (no PTFE)	20 mL	00352309065748	Grey	No	
003	0089_SW130	Clear Plastic Bottle - Natural	125 mL	00070821217447	Green	No	
003	0089_SW130	HDPE (no PTFE)	20 mL	00352309065813	Grey	No	
003	0089_SW130	HDPE (no PTFE)	20 mL	00352309065746	Grey	No	
004	0089_PW364	Clear Plastic Bottle - Natural	125 mL	00070821217519	Green	No	
004	0089_PW364	HDPE (no PTFE)	20 mL	00352309065898	Grey	No	
004	0089_PW364	HDPE (no PTFE)	20 mL	00352309065882	Grey	No	
005	0089_SW132	Clear Plastic Bottle - Natural	125 mL	00070821217353	Green	No	
005	0089_SW132	HDPE (no PTFE)	20 mL	00352309065762	Grey	No	
005	0089_SW132	HDPE (no PTFE)	20 mL	00352309065742	Grey	No	
006	0089_PW340	Clear Plastic Bottle - Natural	125 mL	00070821217397	Green	No	
006	0089_PW340	HDPE (no PTFE)	20 mL	00352309065766	Grey	No	
006	0089_PW340	HDPE (no PTFE)	20 mL	00352309065747	Grey	No	
007	0089_PW363	HDPE (no PTFE)	20 mL	00352309065973	Grey	No	
007	0089_PW363	HDPE (no PTFE)	20 mL	00352309065775	Grey	No	
007	0089_PW363	Clear Plastic Bottle - Natural	125 mL	00070821217417	Green	No	
008	0089_SW134	Clear Plastic Bottle - Natural	125 mL	00070821217452	Green	No	
008	0089_SW134	HDPE (no PTFE)	20 mL	00352309065809	Grey	No	
008	0089_SW134	HDPE (no PTFE)	20 mL	00352309065971	Grey	No	
009	0089_PW341	Clear Plastic Bottle - Natural	125 mL	00070821217441	Green	No	
009	0089_PW341	HDPE (no PTFE)	20 mL	00352309065908	Grey	No	

CHAIN OF CUSTODY

COC#: 64892 *ALS Laboratory:* EP Perth Environmental

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP_24

SITE: Stirling SW/PW - JS

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER:

CONTACT PH: [redacted]

QUOTE NO: SY/139/19 B

SAMPLER MOBILE: [redacted] / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO:

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

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:

009	0089_PW341	HDPE (no PTFE)	20 mL	00352309065866	Grey	No	
010	0089_PW362	Clear Plastic Bottle - Natural	125 mL	00070821217432	Green	No	
010	0089_PW362	HDPE (no PTFE)	20 mL	00352309065880	Grey	No	
010	0089_PW362	HDPE (no PTFE)	20 mL	00352309065983	Grey	No	

Total Bottle Count: ALS: 30, Non ALS: 0

SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : **EP2403140**

Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: Customer Services EP
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
E-mail	: [redacted]stantec.com	E-mail	: ALSEnviro.Perth@alsglobal.com
Telephone	: ----	Telephone	: +61-8-9406 1301
Facsimile	: ----	Facsimile	: +61-8-9406 1399
Project	: WA_0089_PFASOMP_24	Page	: 1 of 2
Order number	: pfas-omp/Stirling	Quote number	: ES2022MWHAUS0002 (SY/139/19 B)
C-O-C number	: 64892	QC Level	: NEPM 2013 B3 & ALS QC Standard
Site	: Stirling SW/PW - JS		
Sampler	: [redacted]		

Dates

Date Samples Received	: 12-Mar-2024 11:45	Issue Date	: 15-Mar-2024
Client Requested Due Date	: 20-Mar-2024	Scheduled Reporting Date	: **20-Mar-2024**

Delivery Details

Mode of Delivery	: Carrier	Security Seal	: Not Available
No. of coolers/boxes	: 3	Temperature	: 9.5 - Ice present
Receipt Detail	:	No. of samples received / analysed	: 10 / 10

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 see scanned COC for sample discrepencies: extra samples , samples not received etc.
- Please direct any queries related to sample condition / numbering / breakages to Sample Receipt (Samples.Perth@alsglobal.com)
- Analytical work for this work order will be conducted at ALS Environmental Perth.
- Please direct any turnaround / technical queries to the laboratory contact designated above.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months) from receipt of samples.
- **pH analysis should be conducted within 6 hours of sampling.**
- **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.**
- 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)	WATER - NT-01 & 02 Ca, Mg, Na, K, Cl, SO4, Alkalinity
EP2403140-001	11-Mar-2024 10:40	0089_PW335_240311	✓	✓
EP2403140-002	11-Mar-2024 10:40	0089_QC104_240311	✓	✓
EP2403140-003	11-Mar-2024 10:41	0089_SW130_240311	✓	✓
EP2403140-004	11-Mar-2024 11:04	0089_PW364_240311	✓	✓
EP2403140-005	11-Mar-2024 11:15	0089_SW132_240311	✓	✓
EP2403140-006	11-Mar-2024 11:16	0089_PW340_240311	✓	✓
EP2403140-007	11-Mar-2024 11:26	0089_PW363_240311	✓	✓
EP2403140-008	11-Mar-2024 11:34	0089_SW134_240311	✓	✓
EP2403140-009	11-Mar-2024 11:35	0089_PW341_240311	✓	✓
EP2403140-010	11-Mar-2024 11:36	0089_PW362_240311	✓	✓

Proactive Holding Time Report

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

Requested Deliverables

[redacted]
- A4 - AU Tax Invoice (INV) — Email — [redacted]cardno.com.au

DERP LAB REPORTS
- EDI Format - ESDAT (ESDAT) — Email — derp.labreports@esdat.com.au

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

CERTIFICATE OF ANALYSIS

Work Order	: **EP2403140**	Page	: 1 of 9
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: Customer Services EP
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: +61-8-9406 1301
Project	: WA_0089_PFASOMP_24	Date Samples Received	: 12-Mar-2024 11:45
Order number	: pfas-omp/Stirling	Date Analysis Commenced	: 13-Mar-2024
C-O-C number	: 64892	Issue Date	: 20-Mar-2024 23:14
Sampler	: [redacted]		
Site	: Stirling SW/PW - JS		
Quote number	: SY/139/19 B		
No. of samples received	: 10		
No. of samples analysed	: 10		

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]	Inorganics Supervisor	Perth Inorganics, Wangara, WA
[redacted]	Senior Organic Chemist	Perth Organics, Wangara, WA

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.
- As per QWI – EN55-3 Data Interpreting Procedures, Ionic balances are typically calculated using Major Anions - Chloride, Alkalinity and Sulfate; and Major Cations - Calcium, Magnesium, Potassium and Sodium. Where applicable and dependent upon sample matrix, the Ionic Balance may also include the additional contribution of Ammonia, Dissolved Metals by ICPMS and H+ to the Cations and Nitrate, SiO2 and Fluoride to the Anions.
- Sodium Adsorption Ratio (where reported): Where results for Na, Ca or Mg are <LOR, a concentration at half the reported LOR is incorporated into the SAR calculation. This represents a conservative approach for Na relative to the assumption that <LOR = zero concentration and a conservative approach for Ca & Mg relative to the assumption that <LOR is equivalent to the LOR concentration.
- 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.
- ED045G: The presence of Thiocyanate, Thiosulfate and Sulfite can positively contribute to the chloride result, thereby may bias results higher than expected. Results should be scrutinised accordingly.

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_PW335_240311	0089_QC104_240311	0089_SW130_240311	0089_PW364_240311	0089_SW132_240311
				Sampling date / time	11-Mar-2024 10:40	11-Mar-2024 10:40	11-Mar-2024 10:41	11-Mar-2024 11:04	11-Mar-2024 11:15
Compound	CAS Number	LOR	Unit		EP2403140-001	EP2403140-002	EP2403140-003	EP2403140-004	EP2403140-005
					Result	Result	Result	Result	Result
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	<1	<1	<1	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	<1	<1	<1	<1
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		186	198	148	179	139
Total Alkalinity as CaCO3	----	1	mg/L		186	198	148	179	139
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		2740	2700	2640	2640	2740
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		19600	20800	19600	19200	18300
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		552	577	508	545	538
Magnesium	7439-95-4	1	mg/L		1660	1740	1560	1650	1650
Sodium	7440-23-5	1	mg/L		11400	12000	10800	11300	11400
Potassium	7440-09-7	1	mg/L		708	751	664	707	704
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		614	647	611	600	576
ø Total Cations	----	0.01	meq/L		678	713	640	672	676
ø Ionic Balance	----	0.01	%		4.99	4.87	2.37	5.69	8.02
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	0.02	0.01
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_PW335_240311	0089_QC104_240311	0089_SW130_240311	0089_PW364_240311	0089_SW132_240311
				Sampling date / time	11-Mar-2024 10:40	11-Mar-2024 10:40	11-Mar-2024 10:41	11-Mar-2024 11:04	11-Mar-2024 11:15
Compound	CAS Number	LOR	Unit		EP2403140-001	EP2403140-002	EP2403140-003	EP2403140-004	EP2403140-005
					Result	Result	Result	Result	Result
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	**0.03**	<0.02	**0.04**
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
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									

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_PW335_240311	0089_QC104_240311	0089_SW130_240311	0089_PW364_240311	0089_SW132_240311
				Sampling date / time	11-Mar-2024 10:40	11-Mar-2024 10:40	11-Mar-2024 10:41	11-Mar-2024 11:04	11-Mar-2024 11:15
Compound	CAS Number	LOR	Unit		EP2403140-001	EP2403140-002	EP2403140-003	EP2403140-004	EP2403140-005
					Result	Result	Result	Result	Result
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
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**	**0.04**	**0.02**	**0.05**
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		**0.01**	**0.01**	**0.01**	**0.02**	**0.01**
Sum of PFAS (WA DER List)	----	0.01	µg/L		**0.01**	**0.01**	**0.04**	**0.02**	**0.05**
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**87.2**	**85.5**	**88.9**	**99.8**	**99.1**
13C8-PFOA	----	0.02	%		**103**	**96.7**	**91.9**	**86.5**	**90.8**

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_PW340_240311	0089_PW363_240311	0089_SW134_240311	0089_PW341_240311	0089_PW362_240311
				Sampling date / time	11-Mar-2024 11:16	11-Mar-2024 11:26	11-Mar-2024 11:34	11-Mar-2024 11:35	11-Mar-2024 11:36
Compound	CAS Number	LOR	Unit		EP2403140-006	EP2403140-007	EP2403140-008	EP2403140-009	EP2403140-010
					Result	Result	Result	Result	Result
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	<1	<1	<1	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	<1	<1	<1	<1
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		185	142	139	136	125
Total Alkalinity as CaCO3	----	1	mg/L		185	142	139	136	125
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		2790	2690	2640	2690	2710
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		19800	18700	18300	19000	18700
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		548	531	484	488	509
Magnesium	7439-95-4	1	mg/L		1650	1650	1500	1520	1580
Sodium	7440-23-5	1	mg/L		11400	11300	10200	10400	10800
Potassium	7440-09-7	1	mg/L		725	700	628	642	667
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		620	586	574	595	586
ø Total Cations	----	0.01	meq/L		678	672	607	618	642
ø Ionic Balance	----	0.01	%		4.41	6.79	2.82	1.94	4.54
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	<0.01	<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

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_PW340_240311	0089_PW363_240311	0089_SW134_240311	0089_PW341_240311	0089_PW362_240311
				Sampling date / time	11-Mar-2024 11:16	11-Mar-2024 11:26	11-Mar-2024 11:34	11-Mar-2024 11:35	11-Mar-2024 11:36
Compound	CAS Number	LOR	Unit		EP2403140-006	EP2403140-007	EP2403140-008	EP2403140-009	EP2403140-010
					Result	Result	Result	Result	Result
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
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									

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_PW340_240311	0089_PW363_240311	0089_SW134_240311	0089_PW341_240311	0089_PW362_240311
				Sampling date / time	11-Mar-2024 11:16	11-Mar-2024 11:26	11-Mar-2024 11:34	11-Mar-2024 11:35	11-Mar-2024 11:36
Compound	CAS Number	LOR	Unit		EP2403140-006	EP2403140-007	EP2403140-008	EP2403140-009	EP2403140-010
					Result	Result	Result	Result	Result
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
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**	<0.01	<0.01	**0.01**	<0.01
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		**0.02**	<0.01	<0.01	**0.01**	<0.01
Sum of PFAS (WA DER List)	----	0.01	µg/L		**0.02**	<0.01	<0.01	**0.01**	<0.01
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**102**	**105**	**100**	**103**	**95.4**
13C8-PFOA	----	0.02	%		**76.2**	**75.1**	**78.7**	**78.2**	**92.1**

Surrogate Control Limits

Sub-Matrix: SURFACE WATER		Recovery Limits (%)	
Compound	CAS Number	Low	High
EP231S: PFAS Surrogate			
13C4-PFOS	----	65	140
13C8-PFOA	----	71	133

QUALITY CONTROL REPORT

Work Order	: **EP2403140**	Page	: 1 of 10
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: Customer Services EP
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: +61-8-9406 1301
Project	: WA_0089_PFASOMP_24	Date Samples Received	: 12-Mar-2024
Order number	: pfas-omp/Stirling	Date Analysis Commenced	: 13-Mar-2024
C-O-C number	: 64892	Issue Date	: 20-Mar-2024
Sampler	: [redacted] [redacted]		
Site	: Stirling SW/PW - JS		
Quote number	: SY/139/19 B		
No. of samples received	: 10		
No. of samples analysed	: 10		

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]	Inorganics Supervisor	Perth Inorganics, Wangara, WA
[redacted]	Senior Organic Chemist	Perth Organics, Wangara, WA

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 (%)*
ED037P: Alkalinity by PC Titrator (QC Lot: 5661685)									
EP2403140-002	0089_QC104_240311	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	198	198	0.0	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	198	198	0.0	0% - 20%
EP2403147-002	Anonymous	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	123	123	0.0	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	123	123	0.0	0% - 20%
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QC Lot: 5660637)									
EP2403140-001	0089_PW335_240311	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	2740	2730	0.6	0% - 20%
EP2403147-021	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	2690	2700	0.6	0% - 20%
ED045G: Chloride by Discrete Analyser (QC Lot: 5660638)									
EP2403140-001	0089_PW335_240311	ED045G: Chloride	16887-00-6	1	mg/L	19600	19600	0.2	0% - 20%
EP2403147-021	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	18400	19100	4.1	0% - 20%
ED093F: Dissolved Major Cations (QC Lot: 5662092)									
EP2403140-001	0089_PW335_240311	ED093F: Calcium	7440-70-2	1	mg/L	552	561	1.7	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	1660	1690	1.9	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	11400	11700	2.3	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	708	728	2.8	0% - 20%
EP2403149-001	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	124	124	0.0	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 (%)*
ED093F: Dissolved Major Cations (QC Lot: 5662092) - continued									
EP2403149-001	Anonymous	ED093F: Magnesium	7439-95-4	1	mg/L	82	82	0.0	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	552	552	0.0	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	32	32	0.0	0% - 20%
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 5660705)									
EP2403147-024	Anonymous	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
EP2403149-003	Anonymous	EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01 (0.07)*	µg/L	16.2	17.0	4.9	0% - 20%
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01 (0.07)*	µg/L	48.0	45.4	5.6	0% - 20%
		EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	0.49	0.50	3.6	0% - 20%
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	0.94	0.90	3.5	0% - 20%
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	0.55	0.52	5.4	0% - 20%
		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: 5660705)									
EP2403147-024	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
EP2403149-003	Anonymous	EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	1.07	1.15	7.6	0% - 20%
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	1.26	1.36	7.6	0% - 20%
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02 (0.07)*	µg/L	13.4	13.6	2.0	0% - 20%
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	0.35	0.35	0.0	0% - 50%
		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

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: 5660705) - continued									
EP2403149-003	Anonymous	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	0.3	0.3	0.0	No Limit
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 5660705)									
EP2403147-024	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
EP2403149-003	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: 5660705)									
EP2403147-024	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
EP2403149-003	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

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: 5660705) - continued									
EP2403149-003	Anonymous	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: 5660705)									
EP2403147-024	Anonymous	EP231X: Sum of PFAS	----	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	<0.01	<0.01	0.0	No Limit
EP2403149-003	Anonymous	EP231X: Sum of PFAS	----	0.01 (0.07)*	µg/L	82.6	81.1	1.8	0% - 20%
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01 (0.07)*	µg/L	64.2	62.4	2.8	0% - 20%
		EP231X: Sum of PFAS (WA DER List)	----	0.01 (0.07)*	µg/L	81.1	79.7	1.8	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
ED037P: Alkalinity by PC Titrator (QCLot: 5661685)								
ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	----	----	----	----
ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	----	----	----	----
ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	<1	----	----	----	----
ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	<1	20 mg/L	95.2	85.1	126
				<1	200 mg/L	101	90.5	111
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 5660637)								
ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<1	25 mg/L	99.5	89.9	112
				<1	500 mg/L	102	89.9	112
ED045G: Chloride by Discrete Analyser (QCLot: 5660638)								
ED045G: Chloride	16887-00-6	1	mg/L	<1	10 mg/L	99.8	88.6	113
				<1	1000 mg/L	105	88.6	113
ED093F: Dissolved Major Cations (QCLot: 5662092)								
ED093F: Calcium	7440-70-2	1	mg/L	<1	50 mg/L	105	86.5	117
ED093F: Magnesium	7439-95-4	1	mg/L	<1	50 mg/L	102	88.4	110
ED093F: Sodium	7440-23-5	1	mg/L	<1	50 mg/L	102	91.4	113
ED093F: Potassium	7440-09-7	1	mg/L	<1	50 mg/L	98.6	84.6	108
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5660703)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.2218 µg/L	107	72.0	130
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.2352 µg/L	75.5	71.0	127
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	0.2373 µg/L	77.7	68.0	131
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.238 µg/L	75.8	69.0	134
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.232 µg/L	88.8	65.0	140
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.241 µg/L	88.4	53.0	142
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5660705)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.2218 µg/L	89.3	72.0	130
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.2352 µg/L	77.0	71.0	127
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	0.2373 µg/L	81.5	68.0	131
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.238 µg/L	81.3	69.0	134
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.232 µg/L	86.0	65.0	140
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.241 µg/L	86.7	53.0	142

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: 5660703)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	1.25 µg/L	95.0	73.0	129
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	0.25 µg/L	88.6	72.0	129
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	0.25 µg/L	104	72.0	129
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	0.25 µg/L	93.0	72.0	130
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	0.25 µg/L	92.4	71.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	0.25 µg/L	92.6	69.0	130
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	0.25 µg/L	82.6	71.0	129
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	0.25 µg/L	81.0	69.0	133
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	0.25 µg/L	90.6	72.0	134
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	0.25 µg/L	89.4	65.0	144
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	0.25 µg/L	95.0	71.0	132
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5660705)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	1.25 µg/L	91.6	73.0	129
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	0.25 µg/L	92.0	72.0	129
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	0.25 µg/L	101	72.0	129
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	0.25 µg/L	88.0	72.0	130
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	0.25 µg/L	89.6	71.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	0.25 µg/L	95.2	69.0	130
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	0.25 µg/L	94.0	71.0	129
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	0.25 µg/L	97.2	69.0	133
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	0.25 µg/L	88.0	72.0	134
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	0.25 µg/L	90.0	65.0	144
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	0.25 µg/L	91.8	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5660703)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.25 µg/L	79.8	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	0.625 µg/L	93.6	68.0	141
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	0.625 µg/L	64.0	60.5	138
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	0.625 µg/L	89.6	68.3	134
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	0.625 µg/L	85.6	62.2	138
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	0.25 µg/L	106	65.0	136
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	0.25 µg/L	110	61.0	135

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: 5660705)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.25 µg/L	84.8	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	0.625 µg/L	104	68.0	141
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	0.625 µg/L	97.4	60.5	138
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	0.625 µg/L	92.1	68.3	134
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	0.625 µg/L	81.0	62.2	138
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	0.25 µg/L	111	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
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5660703)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.2343 µg/L	97.3	63.0	143
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	0.2378 µg/L	104	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	0.24 µg/L	100	67.0	138
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	0.241 µg/L	85.1	64.2	133
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5660705)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.2343 µg/L	92.8	63.0	143
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	0.2378 µg/L	96.7	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	0.24 µg/L	100	67.0	138
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	0.241 µg/L	78.8	64.2	133
EP231P: PFAS Sums (QCLot: 5660703)								
EP231X: Sum of PFAS	----	0.01	µg/L	<0.01	----	----	----	----
EP231X: Sum of PFHxS and PFOS	355-46-4/17 63-23-1	0.01	µg/L	<0.01	----	----	----	----
EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	<0.01	----	----	----	----
EP231P: PFAS Sums (QCLot: 5660705)								
EP231X: Sum of PFAS	----	0.01	µg/L	<0.01	----	----	----	----
EP231X: Sum of PFHxS and PFOS	355-46-4/17 63-23-1	0.01	µg/L	<0.01	----	----	----	----
EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	<0.01	----	----	----	----

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**

Matrix Spike (MS) Report

Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 5660637)							
EP2403140-001	0089_PW335_240311	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	100 mg/L	# Not Determined	70.4	130
ED045G: Chloride by Discrete Analyser (QCLot: 5660638)							
EP2403140-001	0089_PW335_240311	ED045G: Chloride	16887-00-6	200 mg/L	# Not Determined	70.0	130
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5660705)							
EP2403147-026	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.2218 µg/L	94.2	72.0	129
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.232 µg/L	79.7	71.0	127
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.2352 µg/L	85.9	68.0	129
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.238 µg/L	79.8	69.0	134
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.232 µg/L	87.5	65.0	140
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.241 µg/L	89.2	53.0	129
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5660705)							
EP2403147-026	Anonymous	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	1.25 µg/L	94.1	73.0	142
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.25 µg/L	89.5	72.0	129
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.25 µg/L	103	72.0	129
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.25 µg/L	87.2	72.0	130
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.25 µg/L	97.8	71.0	133
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.25 µg/L	97.2	69.0	130
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.25 µg/L	89.2	71.0	134
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.25 µg/L	94.8	69.0	133
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.25 µg/L	93.0	72.0	134
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.25 µg/L	84.4	65.0	144
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.25 µg/L	95.0	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5660705)							
EP2403147-026	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.25 µg/L	85.8	59.0	135
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.625 µg/L	110	70.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.625 µg/L	91.4	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.625 µg/L	92.1	70.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.625 µg/L	87.9	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.25 µg/L	91.8	65.0	136
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.25 µg/L	85.8	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5660705)							

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: 5660705) - continued							
EP2403147-026	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.234 µg/L	96.2	63.0	143
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.2378 µg/L	99.3	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.24 µg/L	102	67.0	138
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.2415 µg/L	79.1	70.0	130

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **EP2403140**	Page	: 1 of 6
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Telephone	: +61-8-9406 1301
Project	: WA_0089_PFASOMP_24	Date Samples Received	: 12-Mar-2024
Site	: Stirling SW/PW - JS	Issue Date	: 20-Mar-2024
Sampler	: [redacted] [redacted]	No. of samples received	: 10
Order number	: pfas-omp/Stirling	No. of samples analysed	: 10

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.**
- **Matrix Spike outliers exist - please see following pages for full details.**
- **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 : Quality Control Samples

Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

Matrix: **WATER**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
Matrix Spike (MS) Recoveries							
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA	EP2403140--001	0089_PW335_240311	**Sulfate as SO4 - Turbidimetric**	14808-79-8	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
ED045G: Chloride by Discrete Analyser	EP2403140--001	0089_PW335_240311	**Chloride**	16887-00-6	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**

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	2	25	8.00	10.00	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)						
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	25	4.00	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*			*Analysis*		
			Date extracted	*Due for extraction*	*Evaluation*	***Date analysed***	*Due for analysis*	*Evaluation*
ED037P: Alkalinity by PC Titrator								
Clear Plastic Bottle - Natural (ED037-P)								
0089_PW335_240311,	0089_QC104_240311,	**11-Mar-2024**	**----**	----	**----**	**14-Mar-2024**	25-Mar-2024	✓
0089_SW130_240311,	0089_PW364_240311,							
0089_SW132_240311,	0089_PW340_240311,							
0089_PW363_240311,	0089_SW134_240311,							
0089_PW341_240311,	0089_PW362_240311							

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
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA							
Clear Plastic Bottle - Natural (ED041G)							
0089_PW335_240311, 0089_QC104_240311, 0089_SW130_240311, 0089_PW364_240311, 0089_SW132_240311, 0089_PW340_240311, 0089_PW363_240311, 0089_SW134_240311, 0089_PW341_240311, 0089_PW362_240311	**11-Mar-2024**	**----**	----	----	**20-Mar-2024**	08-Apr-2024	✓
ED045G: Chloride by Discrete Analyser							
Clear Plastic Bottle - Natural (ED045G)							
0089_PW335_240311, 0089_QC104_240311, 0089_SW130_240311, 0089_PW364_240311, 0089_SW132_240311, 0089_PW340_240311, 0089_PW363_240311, 0089_SW134_240311, 0089_PW341_240311, 0089_PW362_240311	**11-Mar-2024**	**----**	----	----	**20-Mar-2024**	08-Apr-2024	✓
ED093F: Dissolved Major Cations							
Clear Plastic Bottle - Natural (ED093F)							
0089_PW335_240311, 0089_QC104_240311, 0089_SW130_240311, 0089_PW364_240311, 0089_SW132_240311, 0089_PW340_240311, 0089_PW363_240311, 0089_SW134_240311, 0089_PW341_240311, 0089_PW362_240311	**11-Mar-2024**	**----**	----	----	**15-Mar-2024**	18-Mar-2024	✓
EP231A: Perfluoroalkyl Sulfonic Acids							
HDPE (no PTFE) (EP231X)							
0089_PW335_240311, 0089_QC104_240311, 0089_SW130_240311, 0089_PW364_240311, 0089_SW132_240311, 0089_PW340_240311, 0089_PW363_240311, 0089_SW134_240311, 0089_PW341_240311, 0089_PW362_240311	**11-Mar-2024**	**14-Mar-2024**	07-Sep-2024	✓	**14-Mar-2024**	07-Sep-2024	✓
EP231B: Perfluoroalkyl Carboxylic Acids							
HDPE (no PTFE) (EP231X)							
0089_PW335_240311, 0089_QC104_240311, 0089_SW130_240311, 0089_PW364_240311, 0089_SW132_240311, 0089_PW340_240311, 0089_PW363_240311, 0089_SW134_240311, 0089_PW341_240311, 0089_PW362_240311	**11-Mar-2024**	**14-Mar-2024**	07-Sep-2024	✓	**14-Mar-2024**	07-Sep-2024	✓
EP231C: Perfluoroalkyl Sulfonamides							
HDPE (no PTFE) (EP231X)							
0089_PW335_240311, 0089_QC104_240311, 0089_SW130_240311, 0089_PW364_240311, 0089_SW132_240311, 0089_PW340_240311, 0089_PW363_240311, 0089_SW134_240311, 0089_PW341_240311, 0089_PW362_240311	**11-Mar-2024**	**14-Mar-2024**	07-Sep-2024	✓	**14-Mar-2024**	07-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)							
0089_PW335_240311, 0089_QC104_240311, 0089_SW130_240311, 0089_PW364_240311, 0089_SW132_240311, 0089_PW340_240311, 0089_PW363_240311, 0089_SW134_240311, 0089_PW341_240311, 0089_PW362_240311	**11-Mar-2024**	**14-Mar-2024**	07-Sep-2024	✓	**14-Mar-2024**	07-Sep-2024	✓
EP231P: PFAS Sums							
HDPE (no PTFE) (EP231X)							
0089_PW335_240311, 0089_QC104_240311, 0089_SW130_240311, 0089_PW364_240311, 0089_SW132_240311, 0089_PW340_240311, 0089_PW363_240311, 0089_SW134_240311, 0089_PW341_240311, 0089_PW362_240311	**11-Mar-2024**	**14-Mar-2024**	07-Sep-2024	✓	**14-Mar-2024**	07-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)							
Alkalinity by Auto Titrator	ED037-P	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	25	**8.00**	**10.00**	×	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Alkalinity by Auto Titrator	ED037-P	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	25	**8.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Alkalinity by Auto Titrator	ED037-P	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	25	**8.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Chloride by Discrete Analyser	ED045G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	25	**4.00**	**5.00**	×	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	20	**5.00**	**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
Alkalinity by Auto Titrator	ED037-P	WATER	In house: Referenced to APHA 2320 B This procedure determines alkalinity by automated measurement (e.g. PC Titrate) on a settled supernatant aliquot of the sample using pH 4.5 for indicating the total alkalinity end-point. This method is compliant with NEPM Schedule B(3)
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	WATER	In house: Referenced to APHA 4500-SO4. Dissolved sulfate is determined in a 0.45um filtered sample. Sulfate ions are converted to a barium sulfate suspension in an acetic acid medium with barium chloride. Light absorbance of the BaSO4 suspension is measured by a photometer and the SO4-2 concentration is determined by comparison of the reading with a standard curve. This method is compliant with NEPM Schedule B(3)
Chloride by Discrete Analyser	ED045G	WATER	In house: Referenced to APHA 4500 Cl - G.The thiocyanate ion is liberated from mercuric thiocyanate through sequestration of mercury by the chloride ion to form non-ionised mercuric chloride. In the presence of ferric ions the liberated thiocynate forms highly-coloured ferric thiocynate which is measured at 480 nm.
Major Cations - Dissolved	ED093F	WATER	In house: Referenced to APHA 3120 and 3125; USEPA SW 846 - 6010 and 6020; Cations are determined by either ICP-AES or ICP-MS techniques. This method is compliant with NEPM Schedule B(3) Sodium Adsorption Ratio is calculated from Ca, Mg and Na which determined by ALS in house method QWI-EN/ED093F. This method is compliant with NEPM Schedule B(3) Hardness parameters are calculated based on APHA 2340 B. This method is compliant with NEPM Schedule B(3)
Ionic Balance by PCT DA and Turbi SO4 DA	* EN055 - PG	WATER	In house: Referenced to APHA 1030F. This method is compliant with NEPM Schedule B(3)
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.

CHAIN OF CUSTODY

COC#: 64879 ALS Laboratory: EP Perth Environmental

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	[redacted]IME: 12/3 1145	DATE TIME:	DATE TIME:

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP_24

SITE: Stirling SW/PW - CG

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted] CONTACT PH: [redacted] SAMPLER MOBILE [redacted]

PRIMARY SAMPLER: [redacted] QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES 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	Rinsate WATER	WA OMP Water Suite WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
001	0089_SW353		11/03/2024 07:34 AM	WATER	ALS: 3 Non ALS: 0	No		X		
002	0089_SW384		11/03/2024 07:35 AM	WATER	ALS: 3 Non ALS: 0	No		X		
003	0089_SW383		11/03/2024 07:37 AM	WATER	ALS: 5 Non ALS: 0	No		X		
004	0089_SW382		11/03/2024 07:38 AM	WATER	ALS: 3 Non ALS: 0	No		X		
005	0089_PW350		11/03/2024 07:44 AM	WATER	ALS: 5 Non ALS: 0	No		X		
006	0089_PW401		11/03/2024 07:45 AM	WATER	ALS: 3 Non ALS: 0	No		X		
007	0089_PW380		11/03/2024 07:47 AM	WATER	ALS: 3 Non ALS: 0	No		X		

Environmental Division Perth

Work Order Reference EP2403147

Telephone : 61-8-9406 1301

CHAIN OF CUSTODY

COC#: 64879 ALS Laboratory: EP Perth Environmental

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

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP_24

SITE: Stirling SW/PW - CG

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted] CONTACT PH: [redacted] SAMPLER MOBILE [redacted]

PRIMARY SAMPLER: QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO [redacted]

EMAIL INVOICES 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	Rinsate WATER	WA OMP Water Suite WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
008	0089_PW351		11/03/2024 07:48 AM	WATER	ALS: 3 Non ALS: 0	No		X		
009	0089_PW381		11/03/2024 07:49 AM	WATER	ALS: 3 Non ALS: 0	No		X		
010	0089_PW352		11/03/2024 07:51 AM	WATER	ALS: 3 Non ALS: 0	No		X		
011	0089_PW314		11/03/2024 10:30 AM	WATER	ALS: 3 Non ALS: 0	No		X		
012	0089_PW306		11/03/2024 10:31 AM	WATER	ALS: 3 Non ALS: 0	No		X		
013	0089_SW309		11/03/2024 10:32 AM	WATER	ALS: 3 Non ALS: 0	No		X		
014	0089_SW311		11/03/2024 10:33 AM	WATER	ALS: 5 Non ALS: 0	No		X		

CHAIN OF CUSTODY

COC#: 64879 ALS Laboratory: EP Perth Environmental

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

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP_24

SITE: Stirling SW/PW - CG

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted] SAMPLER MOBIL[redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO [redacted]

EMAIL INVOICES 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	Rinsate WATER	WA OMP Water Suite WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
015	0089_PW315		11/03/2024 10:35 AM	WATER	ALS: 3 Non ALS: 0	No		X		
016	0089_QC102		11/03/2024 10:36 AM	WATER	ALS: 3 Non ALS: 0	No		X		
017	0089_SW310		11/03/2024 10:37 AM	WATER	ALS: 3 Non ALS: 0	No		X		
018	0089_QC103		11/03/2024 10:40 AM	WATER	ALS: 3 Non ALS: 0	No		X		
019	0089_PW307		11/03/2024 10:41 AM	WATER	ALS: 3 Non ALS: 0	No		X		
020	0089_PW316		11/03/2024 10:42 AM	WATER	ALS: 5 Non ALS: 0	No		X		
021	0089_PW308		11/03/2024 10:44 AM	WATER	ALS: 3 Non ALS: 0	No		X		

CHAIN OF CUSTODY

ALS COC#: 64879 ALS Laboratory: EP Perth Environmental

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

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP_24

SITE: Stirling SW/PW - CG

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES 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	Rinsate WATER	WA OMP Water Suite WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
022	0089_PW375		11/03/2024 02:12 PM	WATER	ALS: 3 Non ALS: 0	No		X		
023	0089_PW374		11/03/2024 02:14 PM	WATER	ALS: 3 Non ALS: 0	No		X		
024	0089_SW317		11/03/2024 02:15 PM	WATER	ALS: 5 Non ALS: 0	No		X		
025	0089_PW378		11/03/2024 02:17 PM	WATER	ALS: 3 Non ALS: 0	No		X		
026	0089_SW318		11/03/2024 02:18 PM	WATER	ALS: 5 Non ALS: 0	No		X		
027	0089_QC302		11/03/2024 03:11 PM	WATER	ALS: 2 Non ALS: 0	No	X			
028	0089_QC402		11/03/2024 03:12 PM	WATER	ALS: 2 Non ALS: 0	No	X			

CHAIN OF CUSTODY

COC#: 64879 ALS Laboratory: EP Perth Environmental

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

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP_24

SITE: Stirling SW/PW - CG

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES 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	Rinsate WATER	WA OMP Water Suite WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
029	0089_QC301		11/03/2024 03:14 PM	WATER	ALS: 2 Non ALS: 0	No	X			
030	0089_QC401		11/03/2024 03:15 PM	WATER	ALS: 2 Non ALS: 0	No	X			

CHAIN OF CUSTODY

ALS COC#: 64879 ALS Laboratory: EP Perth Environmental

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

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP_24

SITE: Stirling SW/PW - CG

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO [redacted]

EMAIL INVOICES 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	0089_SW353	Clear Plastic Bottle - Natural	125 mL	00070821217593	Green	No	
001	0089_SW353	HDPE (no PTFE)	20 mL	00352309066036	Grey	No	
001	0089_SW353	HDPE (no PTFE)	20 mL	00352309065998	Grey	No	
002	0089_SW384	Clear Plastic Bottle - Natural	125 mL	00070821217533	Green	No	
002	0089_SW384	HDPE (no PTFE)	20 mL	00352309065941	Grey	No	
002	0089_SW384	HDPE (no PTFE)	20 mL	00352309065846	Grey	No	
003	0089_SW383	Clear Plastic Bottle - Natural	125 mL	00070821217554	Green	No	
003	0089_SW383	HDPE (no PTFE)	20 mL	00352309065924	Grey	No	
003	0089_SW383	HDPE (no PTFE)	20 mL	00352309065763	Grey	No	
003	0089_SW383	HDPE (no PTFE)	20 mL	00350822024942	Grey	No	
003	0089_SW383	HDPE (no PTFE)	20 mL	00350822025084	Grey	No	
004	0089_SW382	HDPE (no PTFE)	20 mL	00352309050447	Grey	No	
004	0089_SW382	Clear Plastic Bottle - Natural	125 mL	00070821217538	Green	No	
004	0089_SW382	HDPE (no PTFE)	20 mL	00352309050639	Grey	No	
005	0089_PW350	HDPE (no PTFE)	20 mL	00352309050501	Grey	No	
005	0089_PW350	Clear Plastic Bottle - Natural	125 mL	00070821217629	Green	No	
005	0089_PW350	HDPE (no PTFE)	20 mL	00352309050656	Grey	No	
005	0089_PW350	HDPE (no PTFE)	20 mL	00350621046366	Grey	No	
005	0089_PW350	HDPE (no PTFE)	20 mL	00350822025303	Grey	No	
006	0089_PW401	Clear Plastic Bottle - Natural	125 mL	00070821217574	Green	No	
006	0089_PW401	HDPE (no PTFE)	20 mL	00352309050547	Grey	No	
006	0089_PW401	HDPE (no PTFE)	20 mL	00352309050549	Grey	No	
007	0089_PW380	HDPE (no PTFE)	20 mL	00352309050534	Grey	No	
007	0089_PW380	HDPE (no PTFE)	20 mL	00352309050376	Grey	No	
007	0089_PW380	Clear Plastic Bottle - Natural	125 mL	00070821217531	Green	No	
008	0089_PW351	HDPE (no PTFE)	20 mL	00352309050569	Grey	No	

CHAIN OF CUSTODY

ALS COC#: 64879 ALS Laboratory: EP Perth Environmental

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP_24

SITE: Stirling SW/PW - CG

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted]

QUOTE NO: SY/139/19 B

SAMPLER MOBILE: [redacted] / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO: [redacted]

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

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:

008	0089_PW351	HDPE (no PTFE)	20 mL	00352309050419	Grey	No	
008	0089_PW351	Clear Plastic Bottle - Natural	125 mL	00070821217502	Green	No	
009	0089_PW381	Clear Plastic Bottle - Natural	125 mL	00070821217483	Green	No	
009	0089_PW381	HDPE (no PTFE)	20 mL	00352309066035	Grey	No	
009	0089_PW381	HDPE (no PTFE)	20 mL	00352309066009	Grey	No	
010	0089_PW352	Clear Plastic Bottle - Natural	125 mL	00070821217448	Green	No	
010	0089_PW352	HDPE (no PTFE)	20 mL	00352309065858	Grey	No	
010	0089_PW352	HDPE (no PTFE)	20 mL	00352309066023	Grey	No	
011	0089_PW314	HDPE (no PTFE)	20 mL	00352309066005	Grey	No	
011	0089_PW314	Clear Plastic Bottle - Natural	125 mL	00070821217470	Green	No	
011	0089_PW314	HDPE (no PTFE)	20 mL	00352309065854	Grey	No	
012	0089_PW306	Clear Plastic Bottle - Natural	125 mL	00070821217563	Green	No	
012	0089_PW306	HDPE (no PTFE)	20 mL	00352309066038	Grey	No	
012	0089_PW306	HDPE (no PTFE)	20 mL	00352309066018	Grey	No	
013	0089_SW309	Clear Plastic Bottle - Natural	125 mL	00070821217517	Green	No	
013	0089_SW309	HDPE (no PTFE)	20 mL	00352309065860	Grey	No	
013	0089_SW309	HDPE (no PTFE)	20 mL	00352309065855	Grey	No	
014	0089_SW311	HDPE (no PTFE)	20 mL	00352312004180	Grey	No	
014	0089_SW311	Clear Plastic Bottle - Natural	125 mL	00070821217507	Green	No	
014	0089_SW311	HDPE (no PTFE)	20 mL	00352309050427	Grey	No	
014	0089_SW311	HDPE (no PTFE)	20 mL	00352312004252	Grey	No	
014	0089_SW311	HDPE (no PTFE)	20 mL	00352309050524	Grey	No	
015	0089_PW315	HDPE (no PTFE)	20 mL	00352309065938	Grey	No	
015	0089_PW315	HDPE (no PTFE)	20 mL	00352309065909	Grey	No	
015	0089_PW315	Clear Plastic Bottle - Natural	125 mL	00070821217521	Green	No	
016	0089_QC102	Clear Plastic Bottle - Natural	125 mL	00070821217430	Green	No	
016	0089_QC102	HDPE (no PTFE)	20 mL	00352309065874	Grey	No	

CHAIN OF CUSTODY

COC#: 64879 ALS Laboratory: EP Perth Environmental

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

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP_24

SITE: Stirling SW/PW - CG

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH [redacted]

QUOTE NO: SY/139/19 B

SAMPLER MOBILE: [redacted] / ES2022MWHAUS0002

EMAIL REPORTS TO [redacted]

EMAIL INVOICES 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	0089_QC102	HDPE (no PTFE)	20 mL	00352309065929	Grey	No	
017	0089_SW310	Clear Plastic Bottle - Natural	125 mL	00070821217459	Green	No	
017	0089_SW310	HDPE (no PTFE)	20 mL	00352309065772	Grey	No	
017	0089_SW310	HDPE (no PTFE)	20 mL	00352309065744	Grey	No	
018	0089_QC103	Clear Plastic Bottle - Natural	125 mL	00070821217494	Green	No	
018	0089_QC103	HDPE (no PTFE)	20 mL	00352309066026	Grey	No	
018	0089_QC103	HDPE (no PTFE)	20 mL	00352309066031	Grey	No	
019	0089_PW307	Clear Plastic Bottle - Natural	125 mL	00070821217572	Green	No	
019	0089_PW307	HDPE (no PTFE)	20 mL	00352309065949	Grey	No	
019	0089_PW307	HDPE (no PTFE)	20 mL	00352309065798	Grey	No	
020	0089_PW316	HDPE (no PTFE)	20 mL	00352309065821	Grey	No	
020	0089_PW316	HDPE (no PTFE)	20 mL	00352312004447	Grey	No	
020	0089_PW316	HDPE (no PTFE)	20 mL	00352312003915	Grey	No	
020	0089_PW316	Clear Plastic Bottle - Natural	125 mL	00070821217613	Green	No	
020	0089_PW316	HDPE (no PTFE)	20 mL	00352309065801	Grey	No	
021	0089_PW308	Clear Plastic Bottle - Natural	125 mL	00070821217458	Green	No	
021	0089_PW308	HDPE (no PTFE)	20 mL	00352309066014	Grey	No	
021	0089_PW308	HDPE (no PTFE)	20 mL	00352309065791	Grey	No	
022	0089_PW375	Clear Plastic Bottle - Natural	125 mL	00070821217489	Green	No	
022	0089_PW375	HDPE (no PTFE)	20 mL	00352309065913	Grey	No	
022	0089_PW375	HDPE (no PTFE)	20 mL	00352309065812	Grey	No	
023	0089_PW374	Clear Plastic Bottle - Natural	125 mL	00070821217592	Green	No	
023	0089_PW374	HDPE (no PTFE)	20 mL	00352309065824	Grey	No	
023	0089_PW374	HDPE (no PTFE)	20 mL	00352309065784	Grey	No	
024	0089_SW317	Clear Plastic Bottle - Natural	125 mL	00070821217491	Green	No	
024	0089_SW317	HDPE (no PTFE)	20 mL	00352309066028	Grey	No	
024	0089_SW317	HDPE (no PTFE)	20 mL	00352309065996	Grey	No	

CHAIN OF CUSTODY

ALS COC#: 64879 ALS Laboratory: EP Perth Environmental

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP_24

SITE: Stirling SW/PW - CG

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted] CONTACT PH [redacted] SAMPLER MOBIL [redacted]

PRIMARY SAMPLER: [redacted] QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS T [redacted]

EMAIL INVOICES T [redacted]

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

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:

024	0089_SW317	HDPE (no PTFE)	20 mL	00352312003770	Grey	No	
024	0089_SW317	HDPE (no PTFE)	20 mL	00352312003720	Grey	No	
025	0089_PW378	Clear Plastic Bottle - Natural	125 mL	00070821217461	Green	No	
025	0089_PW378	HDPE (no PTFE)	20 mL	00352309050475	Grey	No	
025	0089_PW378	HDPE (no PTFE)	20 mL	00352309050461	Grey	No	
026	0089_SW318	HDPE (no PTFE)	20 mL	00352309066013	Grey	No	
026	0089_SW318	HDPE (no PTFE)	20 mL	00352309065887	Grey	No	
026	0089_SW318	Clear Plastic Bottle - Natural	125 mL	00070821217611	Green	No	
026	0089_SW318	HDPE (no PTFE)	20 mL	00352312004421	Grey	No	
026	0089_SW318	HDPE (no PTFE)	20 mL	00352312004034	Grey	No	
027	0089_QC302	HDPE (no PTFE)	20 mL	00352309065758	Grey	No	
027	0089_QC302	HDPE (no PTFE)	20 mL	00352312004345	Grey	No	
028	0089_QC402	HDPE (no PTFE)	20 mL	00352312004069	Grey	No	
028	0089_QC402	HDPE (no PTFE)	20 mL	00352309065945	Grey	No	
029	0089_QC301	HDPE (no PTFE)	20 mL	00352309065754	Grey	No	
029	0089_QC301	HDPE (no PTFE)	20 mL	00352312004435	Grey	No	
030	0089_QC401	HDPE (no PTFE)	20 mL	00352309066019	Grey	No	
030	0089_QC401	HDPE (no PTFE)	20 mL	00352309065833	Grey	No	

Total Bottle Count: ALS: 98, Non ALS: 0

SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : **EP2403147**

Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: Customer Services EP
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
E-mail	: [redacted]stantec.com	E-mail	: ALSEnviro.Perth@alsglobal.com
Telephone	: ----	Telephone	: +61-8-9406 1301
Facsimile	: ----	Facsimile	: +61-8-9406 1399
Project	: WA_0089_PFASOMP_24	Page	: 1 of 3
Order number	: pfas-omp/Stirling	Quote number	: ES2022MWHAUS0002 (SY/139/19 B)
C-O-C number	: 64879	QC Level	: NEPM 2013 B3 & ALS QC Standard
Site	: Stirling SW/PW - CG		
Sampler	: [redacted]		

Dates

Date Samples Received	: 13-Mar-2024 11:45	Issue Date	: 14-Mar-2024
Client Requested Due Date	: 20-Mar-2024	Scheduled Reporting Date	: **20-Mar-2024**

Delivery Details

Mode of Delivery	: Carrier	Security Seal	: Not Available
No. of coolers/boxes	: 3	Temperature	: ----
Receipt Detail	:	No. of samples received / analysed	: 31 / 31

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 see scanned COC for sample discrepencies: extra samples , samples not received etc.
- Please direct any queries related to sample condition / numbering / breakages to Sample Receipt (Samples.Perth@alsglobal.com)
- Analytical work for this work order will be conducted at ALS Environmental Perth.
- Please direct any turnaround / technical queries to the laboratory contact designated above.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months) from receipt of samples.
- **pH analysis should be conducted within 6 hours of sampling.**
- **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.**
- 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)	WATER - NT-01 & 02 Ca, Mg, Na, K, Cl, SO4, Alkalinity
EP2403147-001	11-Mar-2024 07:34	0089_SW353_240311	✓	✓
EP2403147-002	11-Mar-2024 07:35	0089_SW384_240311	✓	✓
EP2403147-003	11-Mar-2024 07:37	0089_SW383_240311	✓	✓
EP2403147-004	11-Mar-2024 07:38	0089_SW382_240311	✓	✓
EP2403147-005	11-Mar-2024 07:44	0089_PW350_240311	✓	✓
EP2403147-006	11-Mar-2024 07:45	0089_PW401_240311	✓	✓
EP2403147-007	11-Mar-2024 07:47	0089_PW380_240311	✓	✓
EP2403147-008	11-Mar-2024 07:48	0089_PW351_240311	✓	✓
EP2403147-009	11-Mar-2024 07:49	0089_PW381_240311	✓	✓
EP2403147-010	11-Mar-2024 07:51	0089_PW352_240311	✓	✓
EP2403147-011	11-Mar-2024 10:30	0089_PW314_240311	✓	✓
EP2403147-012	11-Mar-2024 10:31	0089_PW306_240311	✓	✓
EP2403147-013	11-Mar-2024 10:32	0089_SW309_240311	✓	✓
EP2403147-014	11-Mar-2024 10:33	0089_SW311_240311	✓	✓
EP2403147-015	11-Mar-2024 10:35	0089_PW315_240311	✓	✓
EP2403147-016	11-Mar-2024 10:36	0089_QC102_240311	✓	✓
EP2403147-017	11-Mar-2024 10:37	0089_SW310_240311	✓	✓
EP2403147-018	11-Mar-2024 10:40	0089_QC103_240311	✓	✓
EP2403147-019	11-Mar-2024 10:41	0089_PW307_240311	✓	✓
EP2403147-020	11-Mar-2024 10:42	0089_PW316_240311	✓	✓
EP2403147-021	11-Mar-2024 10:44	0089_PW308_240311	✓	✓
EP2403147-022	11-Mar-2024 14:12	0089_PW375_240311	✓	✓
EP2403147-023	11-Mar-2024 14:14	0089_PW374_240311	✓	✓
EP2403147-024	11-Mar-2024 14:15	0089_SW317_240311	✓	✓
EP2403147-025	11-Mar-2024 14:17	0089_PW378_240311	✓	✓
EP2403147-026	11-Mar-2024 14:18	0089_SW318_240311	✓	✓
EP2403147-027	11-Mar-2024 15:11	0089_QC302_240311	✓	
EP2403147-028	11-Mar-2024 15:12	0089_QC402_240311	✓	
EP2403147-029	11-Mar-2024 15:14	0089_QC301_240311	✓	
EP2403147-030	11-Mar-2024 15:15	0089_QC401_240311	✓	
EP2403147-031	11-Mar-2024 14:17	0089_SW319_240311	✓	✓

Proactive Holding Time Report

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

Requested Deliverables

[redacted]

- A4 - AU Tax Invoice (INV)	Email	[redacted]cardno.com.au

DERP LAB REPORTS

- EDI Format - ESDAT (ESDAT)	Email	derp.labreports@esdat.com.au

[redacted]

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

CERTIFICATE OF ANALYSIS

Work Order	: **EP2403147**	Page	: 1 of 23
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: Customer Services EP
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: +61-8-9406 1301
Project	: WA_0089_PFASOMP_24	Date Samples Received	: 13-Mar-2024 11:45
Order number	: pfas-omp/Stirling	Date Analysis Commenced	: 13-Mar-2024
C-O-C number	: 64879	Issue Date	: 21-Mar-2024 00:00
Sampler	: [redacted] [redacted]		
Site	: Stirling SW/PW - CG		
Quote number	: SY/139/19 B		
No. of samples received	: 31		
No. of samples analysed	: 31		

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]	Inorganics Supervisor	Perth Inorganics, Wangara, WA
[redacted]	Senior Organic Chemist	Perth Organics, Wangara, WA

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.
- As per QWI – EN55-3 Data Interpreting Procedures, Ionic balances are typically calculated using Major Anions - Chloride, Alkalinity and Sulfate; and Major Cations - Calcium, Magnesium, Potassium and Sodium. Where applicable and dependent upon sample matrix, the Ionic Balance may also include the additional contribution of Ammonia, Dissolved Metals by ICPMS and H+ to the Cations and Nitrate, SiO2 and Fluoride to the Anions.
- Sodium Adsorption Ratio (where reported): Where results for Na, Ca or Mg are <LOR, a concentration at half the reported LOR is incorporated into the SAR calculation. This represents a conservative approach for Na relative to the assumption that <LOR = zero concentration and a conservative approach for Ca & Mg relative to the assumption that <LOR is equivalent to the LOR concentration.
- 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.
- ED045G: The presence of Thiocyanate, Thiosulfate and Sulfite can positively contribute to the chloride result, thereby may bias results higher than expected. Results should be scrutinised accordingly.

Analytical Results

Sub-Matrix: RINSATE (Matrix: WATER)				Sample ID	0089_QC302_240311	0089_QC402_240311	0089_QC301_240311	0089_QC401_240311	----
				Sampling date / time	11-Mar-2024 15:11	11-Mar-2024 15:12	11-Mar-2024 15:14	11-Mar-2024 15:15	----
Compound	CAS Number	LOR	Unit		EP2403147-027	EP2403147-028	EP2403147-029	EP2403147-030	--------
					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		<0.01	<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	----
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		<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	----
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		<0.02	<0.02	<0.02	<0.02	----
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
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	----

Analytical Results

Sub-Matrix: RINSATE (Matrix: WATER)				Sample ID	0089_QC302_240311	0089_QC402_240311	0089_QC301_240311	0089_QC401_240311	----
				Sampling date / time	11-Mar-2024 15:11	11-Mar-2024 15:12	11-Mar-2024 15:14	11-Mar-2024 15:15	----
Compound	CAS Number	LOR	Unit		EP2403147-027	EP2403147-028	EP2403147-029	EP2403147-030	--------
					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	----
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		<0.01	<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	----
Sum of PFAS (WA DER List)	----	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	----
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**92.6**	**107**	**109**	**109**	----
13C8-PFOA	----	0.02	%		**91.9**	**76.0**	**81.4**	**81.5**	----

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_SW353_240311	0089_SW384_240311	0089_SW383_240311	0089_SW382_240311	0089_PW350_240311
				Sampling date / time	11-Mar-2024 07:34	11-Mar-2024 07:35	11-Mar-2024 07:37	11-Mar-2024 07:38	11-Mar-2024 07:44
Compound	CAS Number	LOR	Unit		EP2403147-001	EP2403147-002	EP2403147-003	EP2403147-004	EP2403147-005
					Result	Result	Result	Result	Result
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	<1	<1	<1	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	<1	<1	<1	<1
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		123	123	122	123	132
Total Alkalinity as CaCO3	----	1	mg/L		123	123	122	123	132
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		2530	2480	2470	2480	2580
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		19100	19300	18300	19600	19100
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		490	499	489	491	483
Magnesium	7439-95-4	1	mg/L		1560	1570	1540	1550	1530
Sodium	7440-23-5	1	mg/L		12000	12100	11800	12100	11900
Potassium	7440-09-7	1	mg/L		645	650	638	640	634
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		594	598	570	607	595
ø Total Cations	----	0.01	meq/L		691	697	681	695	684
ø Ionic Balance	----	0.01	%		7.58	7.60	8.85	6.74	6.94
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

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_SW353_240311	0089_SW384_240311	0089_SW383_240311	0089_SW382_240311	0089_PW350_240311
				Sampling date / time	11-Mar-2024 07:34	11-Mar-2024 07:35	11-Mar-2024 07:37	11-Mar-2024 07:38	11-Mar-2024 07:44
Compound	CAS Number	LOR	Unit		EP2403147-001	EP2403147-002	EP2403147-003	EP2403147-004	EP2403147-005
					Result	Result	Result	Result	Result
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
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									

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_SW353_240311	0089_SW384_240311	0089_SW383_240311	0089_SW382_240311	0089_PW350_240311
				Sampling date / time	11-Mar-2024 07:34	11-Mar-2024 07:35	11-Mar-2024 07:37	11-Mar-2024 07:38	11-Mar-2024 07:44
Compound	CAS Number	LOR	Unit		EP2403147-001	EP2403147-002	EP2403147-003	EP2403147-004	EP2403147-005
					Result	Result	Result	Result	Result
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
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	%		**101**	**98.8**	**100**	**94.6**	**97.7**
13C8-PFOA	----	0.02	%		**84.2**	**81.1**	**86.3**	**84.1**	**77.2**

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_PW401_240311	0089_PW380_240311	0089_PW351_240311	0089_PW381_240311	0089_PW352_240311
				Sampling date / time	11-Mar-2024 07:45	11-Mar-2024 07:47	11-Mar-2024 07:48	11-Mar-2024 07:49	11-Mar-2024 07:51
Compound	CAS Number	LOR	Unit		EP2403147-006	EP2403147-007	EP2403147-008	EP2403147-009	EP2403147-010
					Result	Result	Result	Result	Result
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	<1	<1	<1	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	<1	<1	<1	<1
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		**124**	**126**	**123**	**123**	**124**
Total Alkalinity as CaCO3	----	1	mg/L		**124**	**126**	**123**	**123**	**124**
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		**2510**	**2540**	**2540**	**2560**	**2560**
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		**19300**	**19600**	**19700**	**19500**	**18800**
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		**492**	**488**	**489**	**497**	**488**
Magnesium	7439-95-4	1	mg/L		**1560**	**1550**	**1550**	**1580**	**1550**
Sodium	7440-23-5	1	mg/L		**12000**	**11900**	**12000**	**12200**	**11900**
Potassium	7440-09-7	1	mg/L		**647**	**640**	**647**	**660**	**645**
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		**599**	**608**	**611**	**606**	**586**
ø Total Cations	----	0.01	meq/L		**691**	**686**	**690**	**702**	**686**
ø Ionic Balance	----	0.01	%		**7.15**	**6.00**	**6.10**	**7.38**	**7.86**
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

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_PW401_240311	0089_PW380_240311	0089_PW351_240311	0089_PW381_240311	0089_PW352_240311
				Sampling date / time	11-Mar-2024 07:45	11-Mar-2024 07:47	11-Mar-2024 07:48	11-Mar-2024 07:49	11-Mar-2024 07:51
Compound	CAS Number	LOR	Unit		EP2403147-006	EP2403147-007	EP2403147-008	EP2403147-009	EP2403147-010
					Result	Result	Result	Result	Result
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
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									

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_PW401_240311	0089_PW380_240311	0089_PW351_240311	0089_PW381_240311	0089_PW352_240311
				Sampling date / time	11-Mar-2024 07:45	11-Mar-2024 07:47	11-Mar-2024 07:48	11-Mar-2024 07:49	11-Mar-2024 07:51
Compound	CAS Number	LOR	Unit		EP2403147-006	EP2403147-007	EP2403147-008	EP2403147-009	EP2403147-010
					Result	Result	Result	Result	Result
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
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	%		**99.8**	**98.0**	**95.6**	**97.7**	**101**
13C8-PFOA	----	0.02	%		**76.5**	**76.0**	**78.6**	**78.8**	**77.5**

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_PW314_240311	0089_PW306_240311	0089_SW309_240311	0089_SW311_240311	0089_PW315_240311
				Sampling date / time	11-Mar-2024 10:30	11-Mar-2024 10:31	11-Mar-2024 10:32	11-Mar-2024 10:33	11-Mar-2024 10:35
Compound	CAS Number	LOR	Unit		EP2403147-011	EP2403147-012	EP2403147-013	EP2403147-014	EP2403147-015
					Result	Result	Result	Result	Result
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	<1	<1	<1	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	<1	<1	<1	<1
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		**124**	**136**	**125**	**123**	**128**
Total Alkalinity as CaCO3	----	1	mg/L		**124**	**136**	**125**	**123**	**128**
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		**2580**	**2560**	**2570**	**2560**	**2580**
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		**19200**	**19300**	**19100**	**18900**	**19400**
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		**507**	**489**	**502**	**493**	**498**
Magnesium	7439-95-4	1	mg/L		**1610**	**1550**	**1590**	**1560**	**1580**
Sodium	7440-23-5	1	mg/L		**12400**	**11900**	**12300**	**12000**	**12200**
Potassium	7440-09-7	1	mg/L		**673**	**644**	**664**	**649**	**658**
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		**598**	**600**	**595**	**589**	**604**
ø Total Cations	----	0.01	meq/L		**714**	**686**	**708**	**692**	**702**
ø Ionic Balance	----	0.01	%		**8.88**	**6.65**	**8.68**	**8.02**	**7.57**
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

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_PW314_240311	0089_PW306_240311	0089_SW309_240311	0089_SW311_240311	0089_PW315_240311
				Sampling date / time	11-Mar-2024 10:30	11-Mar-2024 10:31	11-Mar-2024 10:32	11-Mar-2024 10:33	11-Mar-2024 10:35
Compound	CAS Number	LOR	Unit		EP2403147-011	EP2403147-012	EP2403147-013	EP2403147-014	EP2403147-015
					Result	Result	Result	Result	Result
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
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									

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_PW314_240311	0089_PW306_240311	0089_SW309_240311	0089_SW311_240311	0089_PW315_240311
				Sampling date / time	11-Mar-2024 10:30	11-Mar-2024 10:31	11-Mar-2024 10:32	11-Mar-2024 10:33	11-Mar-2024 10:35
Compound	CAS Number	LOR	Unit		EP2403147-011	EP2403147-012	EP2403147-013	EP2403147-014	EP2403147-015
					Result	Result	Result	Result	Result
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
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	%		**101**	**103**	**109**	**102**	**100**
13C8-PFOA	----	0.02	%		**75.0**	**77.5**	**81.0**	**74.7**	**80.1**

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_QC102_240311	0089_SW310_240311	0089_QC103_240311	0089_PW307_240311	0089_PW316_240311
				Sampling date / time	11-Mar-2024 10:36	11-Mar-2024 10:37	11-Mar-2024 10:40	11-Mar-2024 10:41	11-Mar-2024 10:42
Compound	CAS Number	LOR	Unit		EP2403147-016	EP2403147-017	EP2403147-018	EP2403147-019	EP2403147-020
					Result	Result	Result	Result	Result
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	<1	<1	<1	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	<1	<1	<1	<1
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		124	124	129	172	125
Total Alkalinity as CaCO3	----	1	mg/L		124	124	129	172	125
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		2520	2560	2600	2500	2470
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		18800	18700	19600	19200	18700
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		490	489	494	488	482
Magnesium	7439-95-4	1	mg/L		1550	1560	1570	1560	1540
Sodium	7440-23-5	1	mg/L		12000	12000	12200	12000	11800
Potassium	7440-09-7	1	mg/L		647	651	660	649	639
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		585	583	610	597	581
ø Total Cations	----	0.01	meq/L		690	691	701	691	680
ø Ionic Balance	----	0.01	%		8.25	8.48	7.00	7.31	7.84
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

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_QC102_240311	0089_SW310_240311	0089_QC103_240311	0089_PW307_240311	0089_PW316_240311
				Sampling date / time	11-Mar-2024 10:36	11-Mar-2024 10:37	11-Mar-2024 10:40	11-Mar-2024 10:41	11-Mar-2024 10:42
Compound	CAS Number	LOR	Unit		EP2403147-016	EP2403147-017	EP2403147-018	EP2403147-019	EP2403147-020
					Result	Result	Result	Result	Result
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
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									

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_QC102_240311	0089_SW310_240311	0089_QC103_240311	0089_PW307_240311	0089_PW316_240311
				Sampling date / time	11-Mar-2024 10:36	11-Mar-2024 10:37	11-Mar-2024 10:40	11-Mar-2024 10:41	11-Mar-2024 10:42
Compound	CAS Number	LOR	Unit		EP2403147-016	EP2403147-017	EP2403147-018	EP2403147-019	EP2403147-020
					Result	Result	Result	Result	Result
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
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	%		**98.4**	**106**	**100**	**95.2**	**95.7**
13C8-PFOA	----	0.02	%		**74.7**	**77.3**	**73.2**	**77.4**	**76.4**

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_PW308_240311	0089_PW375_240311	0089_PW374_240311	0089_SW317_240311	0089_PW378_240311
				Sampling date / time	11-Mar-2024 10:44	11-Mar-2024 14:12	11-Mar-2024 14:14	11-Mar-2024 14:15	11-Mar-2024 14:17
Compound	CAS Number	LOR	Unit		EP2403147-021	EP2403147-022	EP2403147-023	EP2403147-024	EP2403147-025
					Result	Result	Result	Result	Result
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	<1	<1	<1	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	<1	<1	<1	<1
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		128	127	134	126	129
Total Alkalinity as CaCO3	----	1	mg/L		128	127	134	126	129
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		2690	2780	2650	2600	2620
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		18400	20500	19800	19000	20800
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		480	475	502	496	488
Magnesium	7439-95-4	1	mg/L		1520	1520	1590	1570	1540
Sodium	7440-23-5	1	mg/L		11700	10800	12200	12100	11900
Potassium	7440-09-7	1	mg/L		629	624	669	654	644
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		578	639	616	593	644
ø Total Cations	----	0.01	meq/L		674	634	704	697	685
ø Ionic Balance	----	0.01	%		7.71	0.33	6.61	8.09	3.11
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	0.02	<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

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_PW308_240311	0089_PW375_240311	0089_PW374_240311	0089_SW317_240311	0089_PW378_240311
				Sampling date / time	11-Mar-2024 10:44	11-Mar-2024 14:12	11-Mar-2024 14:14	11-Mar-2024 14:15	11-Mar-2024 14:17
Compound	CAS Number	LOR	Unit		EP2403147-021	EP2403147-022	EP2403147-023	EP2403147-024	EP2403147-025
					Result	Result	Result	Result	Result
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	**0.14**	**0.15**	<0.02	**0.17**
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		<0.02	**0.08**	**0.15**	<0.02	**0.08**
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
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									

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_PW308_240311	0089_PW375_240311	0089_PW374_240311	0089_SW317_240311	0089_PW378_240311
				Sampling date / time	11-Mar-2024 10:44	11-Mar-2024 14:12	11-Mar-2024 14:14	11-Mar-2024 14:15	11-Mar-2024 14:17
Compound	*CAS Number*	*LOR*	*Unit*		EP2403147-021	EP2403147-022	EP2403147-023	EP2403147-024	EP2403147-025
					Result	Result	Result	Result	Result
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
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	**0.11**	<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	**0.23**	**0.43**	<0.01	**0.25**
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		<0.01	**0.01**	**0.02**	<0.01	<0.01
Sum of PFAS (WA DER List)	----	0.01	µg/L		<0.01	**0.23**	**0.43**	<0.01	**0.25**
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**92.2**	**94.5**	**88.0**	**91.6**	**98.0**
13C8-PFOA	----	0.02	%		**90.8**	**96.1**	**92.4**	**97.6**	**105**

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_SW318_240311	0089_SW319_240311	----	----	----
				Sampling date / time	11-Mar-2024 14:18	11-Mar-2024 14:17	----	----	----
Compound	CAS Number	LOR	Unit		EP2403147-026	EP2403147-031	--------	--------	--------
					Result	Result	----	----	----
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	<1	----	----	----
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	<1	----	----	----
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		**126**	**124**	----	----	----
Total Alkalinity as CaCO3	----	1	mg/L		**126**	**124**	----	----	----
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		**2600**	**2480**	----	----	----
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		**19200**	**18500**	----	----	----
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		**489**	**466**	----	----	----
Magnesium	7439-95-4	1	mg/L		**1550**	**1510**	----	----	----
Sodium	7440-23-5	1	mg/L		**12000**	**11600**	----	----	----
Potassium	7440-09-7	1	mg/L		**647**	**614**	----	----	----
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		**598**	**576**	----	----	----
ø Total Cations	----	0.01	meq/L		**690**	**668**	----	----	----
ø Ionic Balance	----	0.01	%		**7.16**	**7.38**	----	----	----
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		<0.01	<0.01	----	----	----
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		<0.01	<0.01	----	----	----
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	<0.02	----	----	----

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)			Sample ID	0089_SW318_240311	0089_SW319_240311	----	----	----
			Sampling date / time	11-Mar-2024 14:18	11-Mar-2024 14:17	----	----	----
Compound	CAS Number	LOR	Unit	EP2403147-026	EP2403147-031	--------	--------	--------
				Result	Result	----	----	----
EP231B: Perfluoroalkyl Carboxylic Acids								
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	<0.1	----	----	----
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	<0.02	----	----	----
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	<0.02	----	----	----
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	<0.02	----	----	----
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	<0.01	----	----	----
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	<0.02	----	----	----
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	<0.02	----	----	----
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	<0.02	----	----	----
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	<0.02	----	----	----
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	<0.02	----	----	----
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	<0.05	----	----	----
EP231C: Perfluoroalkyl Sulfonamides								
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	<0.02	----	----	----
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	<0.05	----	----	----
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	<0.05	----	----	----
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	<0.05	----	----	----
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	<0.05	----	----	----
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	<0.02	----	----	----
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	<0.02	----	----	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids								

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_SW318_240311	0089_SW319_240311	----	----	----
				Sampling date / time	11-Mar-2024 14:18	11-Mar-2024 14:17	----	----	----
Compound	CAS Number	LOR	Unit		EP2403147-026	EP2403147-031	--------	--------	--------
					Result	Result	----	----	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L		<0.05	<0.05	----	----	----
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		<0.05	<0.05	----	----	----
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		<0.05	<0.05	----	----	----
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L		<0.05	<0.05	----	----	----
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L		<0.01	<0.01	----	----	----
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		<0.01	<0.01	----	----	----
Sum of PFAS (WA DER List)	----	0.01	µg/L		<0.01	<0.01	----	----	----
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**99.1**	**91.9**	----	----	----
13C8-PFOA	----	0.02	%		**95.0**	**90.2**	----	----	----

Surrogate Control Limits

Sub-Matrix: **RINSATE**		Recovery Limits (%)	
Compound	*CAS Number*	*Low*	*High*
EP231S: PFAS Surrogate			
13C4-PFOS	----	65	140
13C8-PFOA	----	71	133

Sub-Matrix: **SURFACE WATER**		Recovery Limits (%)	
Compound	*CAS Number*	*Low*	*High*
EP231S: PFAS Surrogate			
13C4-PFOS	----	65	140
13C8-PFOA	----	71	133

QUALITY CONTROL REPORT

Work Order	: **EP2403147**	Page	: 1 of 19
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: Customer Services EP
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: +61-8-9406 1301
Project	: WA_0089_PFASOMP_24	Date Samples Received	: 13-Mar-2024
Order number	: pfas-omp/Stirling	Date Analysis Commenced	: 13-Mar-2024
C-O-C number	: 64879	Issue Date	: 21-Mar-2024
Sampler	: [redacted] [redacted]		
Site	: Stirling SW/PW - CG		
Quote number	: SY/139/19 B		
No. of samples received	: 31		
No. of samples analysed	: 31		

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]	Inorganics Supervisor	Perth Inorganics, Wangara, WA
[redacted]	Senior Organic Chemist	Perth Organics, Wangara, WA

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 (%)
ED037P: Alkalinity by PC Titrator (QC Lot: 5661685)									
EP2403140-002	Anonymous	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	198	198	0.0	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	198	198	0.0	0% - 20%
EP2403147-002	0089_SW384_240311	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	123	123	0.0	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	123	123	0.0	0% - 20%
ED037P: Alkalinity by PC Titrator (QC Lot: 5662188)									
EP2403279-002	Anonymous	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	418	419	0.3	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	418	419	0.3	0% - 20%
EP2403279-003	Anonymous	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	419	419	0.0	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	419	419	0.0	0% - 20%
ED037P: Alkalinity by PC Titrator (QC Lot: 5662718)									
EP2403138-002	Anonymous	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	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 (%)
ED037P: Alkalinity by PC Titrator (QC Lot: 5662718) - continued									
EP2403138-002	Anonymous	ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	431	429	0.4	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	431	429	0.4	0% - 20%
EP2403138-012	Anonymous	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	425	426	0.0	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	425	426	0.0	0% - 20%
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QC Lot: 5660629)									
EP2403147-001	0089_SW353_240311	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	2530	2520	0.3	0% - 20%
EP2403147-011	0089_PW314_240311	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	2580	2480	3.8	0% - 20%
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QC Lot: 5660637)									
EP2403140-001	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	2740	2730	0.6	0% - 20%
EP2403147-021	0089_PW308_240311	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	2690	2700	0.6	0% - 20%
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QC Lot: 5662861)									
EP2403138-001	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	80	78	2.1	0% - 20%
EP2403138-011	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	6	6	0.0	No Limit
ED045G: Chloride by Discrete Analyser (QC Lot: 5660630)									
EP2403147-001	0089_SW353_240311	ED045G: Chloride	16887-00-6	1	mg/L	19100	19200	0.3	0% - 20%
EP2403147-011	0089_PW314_240311	ED045G: Chloride	16887-00-6	1	mg/L	19200	18800	2.1	0% - 20%
ED045G: Chloride by Discrete Analyser (QC Lot: 5660638)									
EP2403140-001	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	19600	19600	0.2	0% - 20%
EP2403147-021	0089_PW308_240311	ED045G: Chloride	16887-00-6	1	mg/L	18400	19100	4.1	0% - 20%
ED045G: Chloride by Discrete Analyser (QC Lot: 5662862)									
EP2403138-001	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	97	94	3.0	0% - 20%
EP2403138-011	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	30	31	0.0	0% - 20%
ED093F: Dissolved Major Cations (QC Lot: 5660386)									
EP2403147-001	0089_SW353_240311	ED093F: Calcium	7440-70-2	1	mg/L	490	504	2.7	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	1560	1590	2.4	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	12000	12300	2.5	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	645	658	2.0	0% - 20%
EP2403147-011	0089_PW314_240311	ED093F: Calcium	7440-70-2	1	mg/L	507	504	0.5	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	1610	1600	0.3	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	12400	12400	0.4	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	673	673	0.0	0% - 20%
ED093F: Dissolved Major Cations (QC Lot: 5660387)									
EP2403147-021	0089_PW308_240311	ED093F: Calcium	7440-70-2	1	mg/L	480	487	1.4	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	1520	1540	0.9	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 (%)*
ED093F: Dissolved Major Cations (QC Lot: 5660387) - continued									
EP2403147-021	0089_PW308_240311	ED093F: Sodium	7440-23-5	1	mg/L	11700	11800	0.8	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	629	635	1.0	0% - 20%
EP2403151-005	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	510	529	3.6	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	1620	1670	3.2	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	12500	13000	3.5	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	678	706	4.0	0% - 20%
ED093F: Dissolved Major Cations (QC Lot: 5663095)									
EP2403138-010	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	81	81	0.0	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	18	18	0.0	0% - 50%
		ED093F: Sodium	7440-23-5	1	mg/L	34	34	0.0	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	3	3	0.0	No Limit
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 5660704)									
EP2403147-003	0089_SW383_240311	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
EP2403147-014	0089_SW311_240311	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: 5660705)									
EP2403147-024	0089_SW317_240311	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
EP2403149-003	Anonymous	EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01 (0.07)*	µg/L	16.2	17.0	4.9	0% - 20%
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01 (0.07)*	µg/L	48.0	45.4	5.6	0% - 20%
		EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	0.49	0.50	3.6	0% - 20%
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	0.94	0.90	3.5	0% - 20%
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	0.55	0.52	5.4	0% - 20%
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	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 (%)*
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 5665735)									
EP2403138-010	Anonymous	EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	1.31	1.28	2.6	0% - 20%
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	1.44	1.49	3.2	0% - 20%
		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	0.03	0.03	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	0.18	0.17	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: 5660704)									
EP2403147-003	0089_SW383_240311	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
EP2403147-014	0089_SW311_240311	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: 5660705)									
EP2403147-024	0089_SW317_240311	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

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: 5660705) - continued									
EP2403147-024	0089_SW317_240311	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
EP2403149-003	Anonymous	EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	1.07	1.15	7.6	0% - 20%
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	1.26	1.36	7.6	0% - 20%
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02 (0.07)*	µg/L	13.4	13.6	2.0	0% - 20%
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	0.35	0.35	0.0	0% - 50%
		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	0.3	0.3	0.0	No Limit
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 5665735)									
EP2403138-010	Anonymous	EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	0.07	0.07	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	0.07	0.07	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: 5660704)									
EP2403147-003	0089_SW383_240311	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

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: 5660704) - continued									
EP2403147-003	0089_SW383_240311	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
EP2403147-014	0089_SW311_240311	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: 5660705)									
EP2403147-024	0089_SW317_240311	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
EP2403149-003	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

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: 5660705) - continued									
EP2403149-003	Anonymous	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: 5665735)									
EP2403138-010	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: 5660704)									
EP2403147-003	0089_SW383_240311	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
EP2403147-014	0089_SW311_240311	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: 5660705)									
EP2403147-024	0089_SW317_240311	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: 5660705) - continued									
EP2403147-024	0089_SW317_240311	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
EP2403149-003	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
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 5665735)									
EP2403138-010	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: 5660704)									
EP2403147-003	0089_SW383_240311	EP231X: Sum of PFAS	----	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	<0.01	<0.01	0.0	No Limit
EP2403147-014	0089_SW311_240311	EP231X: Sum of PFAS	----	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	<0.01	<0.01	0.0	No Limit
EP231P: PFAS Sums (QC Lot: 5660705)									
EP2403147-024	0089_SW317_240311	EP231X: Sum of PFAS	----	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	<0.01	<0.01	0.0	No Limit
EP2403149-003	Anonymous	EP231X: Sum of PFAS	----	0.01 (0.07)*	µg/L	82.6	81.1	1.8	0% - 20%
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01 (0.07)*	µg/L	64.2	62.4	2.8	0% - 20%
		EP231X: Sum of PFAS (WA DER List)	----	0.01 (0.07)*	µg/L	81.1	79.7	1.8	0% - 20%
EP231P: PFAS Sums (QC Lot: 5665735)									

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 (%)*
EP231P: PFAS Sums (QC Lot: 5665735) - continued									
EP2403138-010	Anonymous	EP231X: Sum of PFAS	----	0.01	µg/L	3.10	3.11	0.3	0% - 20%
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	2.75	2.77	0.7	0% - 20%
		EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	2.89	2.91	0.7	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
ED037P: Alkalinity by PC Titrator (QCLot: 5661685)								
ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	----	----	----	----
ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	----	----	----	----
ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	<1	----	----	----	----
ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	<1	20 mg/L	95.2	85.1	126
				<1	200 mg/L	101	90.5	111
ED037P: Alkalinity by PC Titrator (QCLot: 5662188)								
ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	----	----	----	----
ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	----	----	----	----
ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	<1	----	----	----	----
ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	<1	20 mg/L	97.4	85.1	126
				<1	200 mg/L	102	90.5	111
ED037P: Alkalinity by PC Titrator (QCLot: 5662718)								
ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	----	----	----	----
ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	----	----	----	----
ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	<1	----	----	----	----
ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	<1	20 mg/L	95.9	85.1	126
				<1	200 mg/L	101	90.5	111
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 5660629)								
ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<1	25 mg/L	96.0	89.9	112
				<1	500 mg/L	100	89.9	112
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 5660637)								
ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<1	25 mg/L	99.5	89.9	112
				<1	500 mg/L	102	89.9	112
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 5662861)								
ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<1	25 mg/L	99.0	89.9	112
				<1	500 mg/L	99.0	89.9	112
ED045G: Chloride by Discrete Analyser (QCLot: 5660630)								

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
ED045G: Chloride by Discrete Analyser (QCLot: 5660630) - continued								
ED045G: Chloride	16887-00-6	1	mg/L	<1	10 mg/L	110	88.6	113
				<1	1000 mg/L	105	88.6	113
ED045G: Chloride by Discrete Analyser (QCLot: 5660638)								
ED045G: Chloride	16887-00-6	1	mg/L	<1	10 mg/L	99.8	88.6	113
				<1	1000 mg/L	105	88.6	113
ED045G: Chloride by Discrete Analyser (QCLot: 5662862)								
ED045G: Chloride	16887-00-6	1	mg/L	<1	10 mg/L	106	88.6	113
				<1	1000 mg/L	106	88.6	113
ED093F: Dissolved Major Cations (QCLot: 5660386)								
ED093F: Calcium	7440-70-2	1	mg/L	<1	50 mg/L	107	86.5	117
ED093F: Magnesium	7439-95-4	1	mg/L	<1	50 mg/L	98.1	88.4	110
ED093F: Sodium	7440-23-5	1	mg/L	<1	50 mg/L	98.2	91.4	113
ED093F: Potassium	7440-09-7	1	mg/L	<1	50 mg/L	95.5	84.6	108
ED093F: Dissolved Major Cations (QCLot: 5660387)								
ED093F: Calcium	7440-70-2	1	mg/L	<1	50 mg/L	105	86.5	117
ED093F: Magnesium	7439-95-4	1	mg/L	<1	50 mg/L	97.8	88.4	110
ED093F: Sodium	7440-23-5	1	mg/L	<1	50 mg/L	98.3	91.4	113
ED093F: Potassium	7440-09-7	1	mg/L	<1	50 mg/L	95.6	84.6	108
ED093F: Dissolved Major Cations (QCLot: 5663095)								
ED093F: Calcium	7440-70-2	1	mg/L	<1	50 mg/L	101	86.5	117
ED093F: Magnesium	7439-95-4	1	mg/L	<1	50 mg/L	101	88.4	110
ED093F: Sodium	7440-23-5	1	mg/L	<1	50 mg/L	99.6	91.4	113
ED093F: Potassium	7440-09-7	1	mg/L	<1	50 mg/L	97.9	84.6	108
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5660704)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.2218 µg/L	80.5	72.0	130
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.2352 µg/L	77.8	71.0	127
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	0.2373 µg/L	80.3	68.0	131
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.238 µg/L	88.6	69.0	134
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.232 µg/L	83.0	65.0	140
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.241 µg/L	84.4	53.0	142
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5660705)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.2218 µg/L	89.3	72.0	130
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.2352 µg/L	77.0	71.0	127
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	0.2373 µg/L	81.5	68.0	131

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
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5660705) - continued								
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.238 µg/L	81.3	69.0	134
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.232 µg/L	86.0	65.0	140
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.241 µg/L	86.7	53.0	142
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5665735)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.2218 µg/L	93.3	72.0	130
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.2352 µg/L	84.2	71.0	127
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	0.2373 µg/L	82.8	68.0	131
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.238 µg/L	79.4	69.0	134
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.232 µg/L	89.4	65.0	140
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.241 µg/L	86.1	53.0	142
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5660704)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	1.25 µg/L	100	73.0	129
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	0.25 µg/L	75.6	72.0	129
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	0.25 µg/L	99.4	72.0	129
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	0.25 µg/L	86.8	72.0	130
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	0.25 µg/L	87.2	71.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	0.25 µg/L	89.0	69.0	130
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	0.25 µg/L	78.8	71.0	129
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	0.25 µg/L	71.8	69.0	133
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	0.25 µg/L	89.0	72.0	134
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	0.25 µg/L	84.4	65.0	144
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	0.25 µg/L	87.8	71.0	132
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5660705)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	1.25 µg/L	91.6	73.0	129
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	0.25 µg/L	92.0	72.0	129
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	0.25 µg/L	101	72.0	129
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	0.25 µg/L	88.0	72.0	130
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	0.25 µg/L	89.6	71.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	0.25 µg/L	95.2	69.0	130
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	0.25 µg/L	94.0	71.0	129
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	0.25 µg/L	97.2	69.0	133
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	0.25 µg/L	88.0	72.0	134
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	0.25 µg/L	90.0	65.0	144
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	0.25 µg/L	91.8	71.0	132

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: 5665735)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	1.25 µg/L	106	73.0	129
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	0.25 µg/L	91.2	72.0	129
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	0.25 µg/L	106	72.0	129
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	0.25 µg/L	89.8	72.0	130
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	0.25 µg/L	92.8	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	87.6	71.0	129
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	0.25 µg/L	92.4	69.0	133
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	0.25 µg/L	92.6	72.0	134
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	0.25 µg/L	92.2	65.0	144
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	0.25 µg/L	100	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5660704)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.25 µg/L	83.0	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	0.625 µg/L	77.6	68.0	141
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	0.625 µg/L	87.8	60.5	138
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	0.625 µg/L	93.1	68.3	134
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	0.625 µg/L	85.9	62.2	138
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	0.25 µg/L	93.0	65.0	136
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	0.25 µg/L	74.6	61.0	135
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5660705)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.25 µg/L	84.8	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	0.625 µg/L	104	68.0	141
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	0.625 µg/L	97.4	60.5	138
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	0.625 µg/L	92.1	68.3	134
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	0.625 µg/L	81.0	62.2	138
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	0.25 µg/L	111	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: 5665735)								

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: 5665735) - continued								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.25 µg/L	88.0	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	0.625 µg/L	105	68.0	141
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	0.625 µg/L	89.4	60.5	138
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	0.625 µg/L	94.0	68.3	134
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	0.625 µg/L	91.6	62.2	138
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	0.25 µg/L	109	65.0	136
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	0.25 µg/L	86.6	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5660704)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.2343 µg/L	98.6	63.0	143
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	0.2378 µg/L	96.7	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	0.24 µg/L	97.3	67.0	138
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	0.241 µg/L	82.4	64.2	133
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5660705)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.2343 µg/L	92.8	63.0	143
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	0.2378 µg/L	96.7	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	0.24 µg/L	100	67.0	138
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	0.241 µg/L	78.8	64.2	133
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5665735)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.2343 µg/L	98.2	63.0	143
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	0.2378 µg/L	101	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	0.24 µg/L	94.4	67.0	138
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	0.241 µg/L	81.1	64.2	133
EP231P: PFAS Sums (QCLot: 5660704)								
EP231X: Sum of PFAS	----	0.01	µg/L	<0.01	----	----	----	----
EP231X: Sum of PFHxS and PFOS	355-46-4/17 63-23-1	0.01	µg/L	<0.01	----	----	----	----
EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	<0.01	----	----	----	----
EP231P: PFAS Sums (QCLot: 5660705)								
EP231X: Sum of PFAS	----	0.01	µg/L	<0.01	----	----	----	----
EP231X: Sum of PFHxS and PFOS	355-46-4/17 63-23-1	0.01	µg/L	<0.01	----	----	----	----
EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	<0.01	----	----	----	----

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	LCS: Spike Recovery (%)	Acceptable Limits (%): Low	Acceptable Limits (%): High
EP231P: PFAS Sums (QCLot: 5665735)								
EP231X: Sum of PFAS	----	0.01	µg/L	<0.01	----	----	----	----
EP231X: Sum of PFHxS and PFOS	355-46-4/17 63-23-1	0.01	µg/L	<0.01	----	----	----	----
EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	<0.01	----	----	----	----

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
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 5660629)							
EP2403147-001	0089_SW353_240311	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	100 mg/L	# Not Determined	70.4	130
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 5660637)							
EP2403140-001	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	100 mg/L	# Not Determined	70.4	130
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 5662861)							
EP2403138-001	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	100 mg/L	105	70.4	130
ED045G: Chloride by Discrete Analyser (QCLot: 5660630)							
EP2403147-001	0089_SW353_240311	ED045G: Chloride	16887-00-6	200 mg/L	# Not Determined	70.0	130
ED045G: Chloride by Discrete Analyser (QCLot: 5660638)							
EP2403140-001	Anonymous	ED045G: Chloride	16887-00-6	200 mg/L	# Not Determined	70.0	130
ED045G: Chloride by Discrete Analyser (QCLot: 5662862)							
EP2403138-001	Anonymous	ED045G: Chloride	16887-00-6	200 mg/L	111	70.0	130
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5660704)							
EP2403147-005	0089_PW350_240311	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.2218 µg/L	81.6	72.0	129
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.232 µg/L	80.8	71.0	127
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.2352 µg/L	80.5	68.0	129
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.238 µg/L	83.9	69.0	134
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.232 µg/L	83.2	65.0	140
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.241 µg/L	83.2	53.0	129
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5660705)							

Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5660705) - continued							
EP2403147-026	0089_SW318_240311	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.2218 µg/L	94.2	72.0	129
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.232 µg/L	79.7	71.0	127
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.2352 µg/L	85.9	68.0	129
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.238 µg/L	79.8	69.0	134
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.232 µg/L	87.5	65.0	140
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.241 µg/L	89.2	53.0	129
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5665735)							
EP2403138-012	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.2218 µg/L	91.6	72.0	129
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.232 µg/L	77.2	71.0	127
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.2352 µg/L	71.3	68.0	129
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.238 µg/L	87.4	69.0	134
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.232 µg/L	85.6	65.0	140
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.241 µg/L	87.8	53.0	129
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5660704)							
EP2403147-005	0089_PW350_240311	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	1.25 µg/L	96.1	73.0	142
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.25 µg/L	81.6	72.0	129
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.25 µg/L	104	72.0	129
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.25 µg/L	92.6	72.0	130
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.25 µg/L	93.4	71.0	133
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.25 µg/L	92.0	69.0	130
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.25 µg/L	86.8	71.0	134
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.25 µg/L	74.0	69.0	133
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.25 µg/L	88.6	72.0	134
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.25 µg/L	85.0	65.0	144
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.25 µg/L	94.2	71.0	132
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5660705)							
EP2403147-026	0089_SW318_240311	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	1.25 µg/L	94.1	73.0	142
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.25 µg/L	89.5	72.0	129
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.25 µg/L	103	72.0	129
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.25 µg/L	87.2	72.0	130
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.25 µg/L	97.8	71.0	133
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.25 µg/L	97.2	69.0	130
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.25 µg/L	89.2	71.0	134
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.25 µg/L	94.8	69.0	133
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.25 µg/L	93.0	72.0	134
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.25 µg/L	84.4	65.0	144
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.25 µg/L	95.0	71.0	132
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5665735)							

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: 5665735) - continued							
EP2403138-012	Anonymous	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	1.25 µg/L	93.8	73.0	142
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.25 µg/L	93.0	72.0	129
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.25 µg/L	105	72.0	129
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.25 µg/L	87.0	72.0	130
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.25 µg/L	94.0	71.0	133
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.25 µg/L	94.4	69.0	130
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.25 µg/L	89.8	71.0	134
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.25 µg/L	99.2	69.0	133
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.25 µg/L	97.6	72.0	134
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.25 µg/L	98.2	65.0	144
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.25 µg/L	95.6	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5660704)							
EP2403147-005	0089_PW350_240311	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.25 µg/L	79.8	59.0	135
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.625 µg/L	81.0	70.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.625 µg/L	95.2	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.625 µg/L	96.6	70.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.625 µg/L	90.2	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.25 µg/L	92.8	65.0	136
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.25 µg/L	87.4	61.0	135
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5660705)							
EP2403147-026	0089_SW318_240311	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.25 µg/L	85.8	59.0	135
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.625 µg/L	110	70.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.625 µg/L	91.4	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.625 µg/L	92.1	70.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.625 µg/L	87.9	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.25 µg/L	91.8	65.0	136
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.25 µg/L	85.8	61.0	135
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5665735)							
EP2403138-012	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.25 µg/L	93.4	59.0	135

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: 5665735) - continued							
EP2403138-012	Anonymous	EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.625 µg/L	109	70.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.625 µg/L	75.5	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.625 µg/L	99.8	70.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.625 µg/L	90.5	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.25 µg/L	99.8	65.0	136
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.25 µg/L	79.6	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5660704)							
EP2403147-005	0089_PW350_240311	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.234 µg/L	93.0	63.0	143
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.2378 µg/L	98.4	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.24 µg/L	95.8	67.0	138
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.2415 µg/L	86.9	70.0	130
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5660705)							
EP2403147-026	0089_SW318_240311	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.234 µg/L	96.2	63.0	143
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.2378 µg/L	99.3	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.24 µg/L	102	67.0	138
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.2415 µg/L	79.1	70.0	130
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5665735)							
EP2403138-012	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.234 µg/L	98.7	63.0	143
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.2378 µg/L	96.7	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.24 µg/L	111	67.0	138
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.2415 µg/L	91.3	70.0	130

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **EP2403147**	Page	: 1 of 9
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Telephone	: +61-8-9406 1301
Project	: WA_0089_PFASOMP_24	Date Samples Received	: 13-Mar-2024
Site	: Stirling SW/PW - CG	Issue Date	: 21-Mar-2024
Sampler	: [redacted]	No. of samples received	: 31
Order number	: pfas-omp/Stirling	No. of samples analysed	: 31

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

Outliers : Analysis Holding Time Compliance

- **Analysis Holding Time Outliers exist - please see following pages for full details.**

Outliers : Frequency of Quality Control Samples

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

Outliers : Quality Control Samples

Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

Matrix: **WATER**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
Matrix Spike (MS) Recoveries							
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA	EP2403147--001	0089_SW353_240311	**Sulfate as SO4 - Turbidimetric**	14808-79-8	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA	EP2403140--001	Anonymous	**Sulfate as SO4 - Turbidimetric**	14808-79-8	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
ED045G: Chloride by Discrete Analyser	EP2403147--001	0089_SW353_240311	**Chloride**	16887-00-6	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
ED045G: Chloride by Discrete Analyser	EP2403140--001	Anonymous	**Chloride**	16887-00-6	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**

Outliers : Analysis Holding Time Compliance

Matrix: **WATER**

Method / Container / Client Sample ID(s)	Extraction / Preparation			Analysis		
	Date extracted	Due for extraction	Days overdue	Date analysed	Due for analysis	Days overdue
ED093F: Dissolved Major Cations						
Clear Plastic Bottle - Natural						
0089_PW316_240311	----	----	----	19-Mar-2024	18-Mar-2024	**1**

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)						
Major Cations - Dissolved	ED093F	5	58	8.62	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

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
ED037P: Alkalinity by PC Titrator							
Clear Plastic Bottle - Natural (ED037-P)							
0089_SW353_240311, 0089_SW384_240311, 0089_SW383_240311, 0089_SW382_240311, 0089_PW350_240311, 0089_PW401_240311, 0089_PW380_240311, 0089_PW351_240311, 0089_PW381_240311, 0089_PW352_240311, 0089_PW314_240311, 0089_PW306_240311, 0089_SW309_240311, 0089_SW311_240311, 0089_PW315_240311, 0089_QC102_240311, 0089_SW310_240311, 0089_QC103_240311, 0089_PW307_240311, 0089_PW316_240311, 0089_PW308_240311, 0089_PW375_240311, 0089_PW374_240311, 0089_SW317_240311, 0089_PW378_240311, 0089_SW318_240311	**11-Mar-2024**	**----**	----	**----**	**14-Mar-2024**	25-Mar-2024	✓
Clear Plastic Bottle - Natural (ED037-P)							
0089_SW319_240311	**11-Mar-2024**	**----**	----	**----**	**15-Mar-2024**	25-Mar-2024	✓
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA							
Clear Plastic Bottle - Natural (ED041G)							
0089_SW353_240311, 0089_SW384_240311, 0089_SW383_240311, 0089_SW382_240311, 0089_PW350_240311, 0089_PW401_240311, 0089_PW380_240311, 0089_PW351_240311, 0089_PW381_240311, 0089_PW352_240311, 0089_PW314_240311, 0089_PW306_240311, 0089_SW309_240311, 0089_SW311_240311, 0089_PW315_240311, 0089_QC102_240311, 0089_SW310_240311, 0089_QC103_240311, 0089_PW307_240311, 0089_PW316_240311, 0089_PW308_240311, 0089_PW375_240311, 0089_PW374_240311, 0089_SW317_240311, 0089_PW378_240311, 0089_SW318_240311, 0089_SW319_240311	**11-Mar-2024**	**----**	----	**----**	**20-Mar-2024**	08-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
ED045G: Chloride by Discrete Analyser							
Clear Plastic Bottle - Natural (ED045G)							
0089_SW353_240311, 0089_SW384_240311, 0089_SW383_240311, 0089_SW382_240311, 0089_PW350_240311, 0089_PW401_240311, 0089_PW380_240311, 0089_PW351_240311, 0089_PW381_240311, 0089_PW352_240311, 0089_PW314_240311, 0089_PW306_240311, 0089_SW309_240311, 0089_SW311_240311, 0089_PW315_240311, 0089_QC102_240311, 0089_SW310_240311, 0089_QC103_240311, 0089_PW307_240311, 0089_PW316_240311, 0089_PW308_240311, 0089_PW375_240311, 0089_PW374_240311, 0089_SW317_240311, 0089_PW378_240311, 0089_SW318_240311, 0089_SW319_240311	**11-Mar-2024**	**----**	----	----	**20-Mar-2024**	08-Apr-2024	✓
ED093F: Dissolved Major Cations							
Clear Plastic Bottle - Natural (ED093F)							
0089_SW353_240311, 0089_SW384_240311, 0089_SW383_240311, 0089_SW382_240311, 0089_PW350_240311, 0089_PW401_240311, 0089_PW380_240311, 0089_PW351_240311, 0089_PW381_240311, 0089_PW352_240311, 0089_PW314_240311, 0089_PW306_240311, 0089_SW309_240311, 0089_SW311_240311, 0089_PW315_240311, 0089_QC102_240311, 0089_SW310_240311, 0089_QC103_240311, 0089_PW307_240311	**11-Mar-2024**	**----**	----	----	**15-Mar-2024**	18-Mar-2024	✓
Clear Plastic Bottle - Natural (ED093F)							
0089_PW316_240311	**11-Mar-2024**	**----**	----	----	**19-Mar-2024**	18-Mar-2024	×
Clear Plastic Bottle - Natural (ED093F)							
0089_PW308_240311, 0089_PW375_240311, 0089_PW374_240311, 0089_SW317_240311, 0089_PW378_240311, 0089_SW318_240311, 0089_SW319_240311	**11-Mar-2024**	**----**	----	----	**15-Mar-2024**	18-Mar-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
EP231A: Perfluoroalkyl Sulfonic Acids							
HDPE (no PTFE) (EP231X)							
0089_SW353_240311, 0089_SW384_240311, 0089_SW383_240311, 0089_SW382_240311, 0089_PW350_240311, 0089_PW401_240311, 0089_PW380_240311, 0089_PW351_240311, 0089_PW381_240311, 0089_PW352_240311, 0089_PW314_240311, 0089_PW306_240311, 0089_SW309_240311, 0089_SW311_240311, 0089_PW315_240311, 0089_QC102_240311, 0089_SW310_240311, 0089_QC103_240311, 0089_PW307_240311, 0089_PW316_240311, 0089_PW308_240311, 0089_PW375_240311, 0089_PW374_240311, 0089_SW317_240311, 0089_PW378_240311, 0089_SW318_240311, 0089_QC302_240311, 0089_QC402_240311, 0089_QC301_240311, 0089_QC401_240311	**11-Mar-2024**	**14-Mar-2024**	07-Sep-2024	✓	**14-Mar-2024**	07-Sep-2024	✓
HDPE (no PTFE) (EP231X)							
0089_SW319_240311	**11-Mar-2024**	**15-Mar-2024**	07-Sep-2024	✓	**15-Mar-2024**	07-Sep-2024	✓
EP231B: Perfluoroalkyl Carboxylic Acids							
HDPE (no PTFE) (EP231X)							
0089_SW353_240311, 0089_SW384_240311, 0089_SW383_240311, 0089_SW382_240311, 0089_PW350_240311, 0089_PW401_240311, 0089_PW380_240311, 0089_PW351_240311, 0089_PW381_240311, 0089_PW352_240311, 0089_PW314_240311, 0089_PW306_240311, 0089_SW309_240311, 0089_SW311_240311, 0089_PW315_240311, 0089_QC102_240311, 0089_SW310_240311, 0089_QC103_240311, 0089_PW307_240311, 0089_PW316_240311, 0089_PW308_240311, 0089_PW375_240311, 0089_PW374_240311, 0089_SW317_240311, 0089_PW378_240311, 0089_SW318_240311, 0089_QC302_240311, 0089_QC402_240311, 0089_QC301_240311, 0089_QC401_240311	**11-Mar-2024**	**14-Mar-2024**	07-Sep-2024	✓	**14-Mar-2024**	07-Sep-2024	✓
HDPE (no PTFE) (EP231X)							
0089_SW319_240311	**11-Mar-2024**	**15-Mar-2024**	07-Sep-2024	✓	**15-Mar-2024**	07-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)							
0089_SW353_240311, 0089_SW384_240311, 0089_SW383_240311, 0089_SW382_240311, 0089_PW350_240311, 0089_PW401_240311, 0089_PW380_240311, 0089_PW351_240311, 0089_PW381_240311, 0089_PW352_240311, 0089_PW314_240311, 0089_PW306_240311, 0089_SW309_240311, 0089_SW311_240311, 0089_PW315_240311, 0089_QC102_240311, 0089_SW310_240311, 0089_QC103_240311, 0089_PW307_240311, 0089_PW316_240311, 0089_PW308_240311, 0089_PW375_240311, 0089_PW374_240311, 0089_SW317_240311, 0089_PW378_240311, 0089_SW318_240311, 0089_QC302_240311, 0089_QC402_240311, 0089_QC301_240311, 0089_QC401_240311	**11-Mar-2024**	**14-Mar-2024**	07-Sep-2024	✓	**14-Mar-2024**	07-Sep-2024	✓
HDPE (no PTFE) (EP231X)							
0089_SW319_240311	**11-Mar-2024**	**15-Mar-2024**	07-Sep-2024	✓	**15-Mar-2024**	07-Sep-2024	✓
EP231D: (n:2) Fluorotelomer Sulfonic Acids							
HDPE (no PTFE) (EP231X)							
0089_SW353_240311, 0089_SW384_240311, 0089_SW383_240311, 0089_SW382_240311, 0089_PW350_240311, 0089_PW401_240311, 0089_PW380_240311, 0089_PW351_240311, 0089_PW381_240311, 0089_PW352_240311, 0089_PW314_240311, 0089_PW306_240311, 0089_SW309_240311, 0089_SW311_240311, 0089_PW315_240311, 0089_QC102_240311, 0089_SW310_240311, 0089_QC103_240311, 0089_PW307_240311, 0089_PW316_240311, 0089_PW308_240311, 0089_PW375_240311, 0089_PW374_240311, 0089_SW317_240311, 0089_PW378_240311, 0089_SW318_240311, 0089_QC302_240311, 0089_QC402_240311, 0089_QC301_240311, 0089_QC401_240311	**11-Mar-2024**	**14-Mar-2024**	07-Sep-2024	✓	**14-Mar-2024**	07-Sep-2024	✓
HDPE (no PTFE) (EP231X)							
0089_SW319_240311	**11-Mar-2024**	**15-Mar-2024**	07-Sep-2024	✓	**15-Mar-2024**	07-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)							
0089_SW353_240311, 0089_SW384_240311, 0089_SW383_240311, 0089_SW382_240311, 0089_PW350_240311, 0089_PW401_240311, 0089_PW380_240311, 0089_PW351_240311, 0089_PW381_240311, 0089_PW352_240311, 0089_PW314_240311, 0089_PW306_240311, 0089_SW309_240311, 0089_SW311_240311, 0089_PW315_240311, 0089_QC102_240311, 0089_SW310_240311, 0089_QC103_240311, 0089_PW307_240311, 0089_PW316_240311, 0089_PW308_240311, 0089_PW375_240311, 0089_PW374_240311, 0089_SW317_240311, 0089_PW378_240311, 0089_SW318_240311, 0089_QC302_240311, 0089_QC402_240311, 0089_QC301_240311, 0089_QC401_240311	**11-Mar-2024**	**14-Mar-2024**	07-Sep-2024	✓	**14-Mar-2024**	07-Sep-2024	✓
HDPE (no PTFE) (EP231X)							
0089_SW319_240311	**11-Mar-2024**	**15-Mar-2024**	07-Sep-2024	✓	**15-Mar-2024**	07-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)							
Alkalinity by Auto Titrator	ED037-P	6	55	**10.91**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	6	60	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	5	58	**8.62**	**10.00**	×	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	5	49	**10.20**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	6	60	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Alkalinity by Auto Titrator	ED037-P	6	55	**10.91**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	6	60	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	3	58	**5.17**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	3	49	**6.12**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	6	60	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Alkalinity by Auto Titrator	ED037-P	3	55	**5.45**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	3	60	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	3	58	**5.17**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	3	49	**6.12**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	3	60	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Chloride by Discrete Analyser	ED045G	3	60	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	3	49	**6.12**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	3	60	**5.00**	**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
Alkalinity by Auto Titrator	ED037-P	WATER	In house: Referenced to APHA 2320 B This procedure determines alkalinity by automated measurement (e.g. PC Titrate) on a settled supernatant aliquot of the sample using pH 4.5 for indicating the total alkalinity end-point. This method is compliant with NEPM Schedule B(3)
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	WATER	In house: Referenced to APHA 4500-SO4. Dissolved sulfate is determined in a 0.45um filtered sample. Sulfate ions are converted to a barium sulfate suspension in an acetic acid medium with barium chloride. Light absorbance of the BaSO4 suspension is measured by a photometer and the SO4-2 concentration is determined by comparison of the reading with a standard curve. This method is compliant with NEPM Schedule B(3)
Chloride by Discrete Analyser	ED045G	WATER	In house: Referenced to APHA 4500 Cl - G.The thiocyanate ion is liberated from mercuric thiocyanate through sequestration of mercury by the chloride ion to form non-ionised mercuric chloride. In the presence of ferric ions the liberated thiocynate forms highly-coloured ferric thiocynate which is measured at 480 nm.
Major Cations - Dissolved	ED093F	WATER	In house: Referenced to APHA 3120 and 3125; USEPA SW 846 - 6010 and 6020; Cations are determined by either ICP-AES or ICP-MS techniques. This method is compliant with NEPM Schedule B(3) Sodium Adsorption Ratio is calculated from Ca, Mg and Na which determined by ALS in house method QWI-EN/ED093F. This method is compliant with NEPM Schedule B(3) Hardness parameters are calculated based on APHA 2340 B. This method is compliant with NEPM Schedule B(3)
Ionic Balance by PCT DA and Turbi SO4 DA	* EN055 - PG	WATER	In house: Referenced to APHA 1030F. This method is compliant with NEPM Schedule B(3)
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.

CHAIN OF CUSTODY

ALS COC#: 64888 ALS Laboratory: EP Perth Environmental

RELINQUISHED BY:	[redacted] D BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	[redacted]E: 12/3 1145	DATE TIME:	DATE TIME:

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP_24

SITE: Stirling SD - CG

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER [redacted] CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

PRIMARY SAMPLER: [redacted] QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES 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 Sediments SEDIMENT	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
001	0089_SD381		11/03/2024 10:00 AM	SOIL	ALS: 1 Non ALS: 0	No	X		
002	0089_SD351		11/03/2024 10:02 AM	SOIL	ALS: 1 Non ALS: 0	No	X		
003	0089_SD352		11/03/2024 10:07 AM	SOIL	ALS: 1 Non ALS: 0	No	X		
004	0089_SD401		11/03/2024 10:08 AM	SOIL	ALS: 1 Non ALS: 0	No	X		
005	0089_SD350		11/03/2024 10:08 AM	SOIL	ALS: 1 Non ALS: 0	No	X		
006	0089_SD380		11/03/2024 10:09 AM	SOIL	ALS: 1 Non ALS: 0	No	X		
007	0089_SD314		11/03/2024 10:49 AM	SOIL	ALS: 1 Non ALS: 0	No	X		

Environmental Division Perth

Work Order Reference

EP2403148

Telephone - 61-8-9406 1301

CHAIN OF CUSTODY

COC#: 64888 ALS Laboratory: EP Perth Environmental

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

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP_24

SITE: Stirling SD - CG

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES 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 Sediments SEDIMENT	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
008	0089_SD306		11/03/2024 10:49 AM	SOIL	ALS: 1 Non ALS: 0	No	X		
009	0089_QC106		11/03/2024 10:50 AM	SOIL	ALS: 1 Non ALS: 0	No	X		
010	0089_SD308		11/03/2024 10:50 AM	SOIL	ALS: 1 Non ALS: 0	No	X		
011	0089_SD315		11/03/2024 10:51 AM	SOIL	ALS: 1 Non ALS: 0	No	X		
012	0089_SD316		11/03/2024 10:52 AM	SOIL	ALS: 1 Non ALS: 0	No	X		
013	0089_SD307		11/03/2024 10:53 AM	SOIL	ALS: 1 Non ALS: 0	No	X		
014	0089_SD375		11/03/2024 02:10 PM	SOIL	ALS: 1 Non ALS: 0	No	X		

CHAIN OF CUSTODY

COC#: 64888 *ALS Laboratory:* EP Perth Environmental

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

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP_24

SITE: Stirling SD - CG

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER:

CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO:

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 Sediments SEDIMENT	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
015	0089_SD374		11/03/2024 02:11 PM	SOIL	ALS: 1 Non ALS: 0	No	X		
016	0089_SD378		11/03/2024 02:12 PM	SOIL	ALS: 1 Non ALS: 0	No	X		

CHAIN OF CUSTODY

COC#: **64888** *ALS Laboratory:* EP Perth Environmental

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

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP_24

SITE: Stirling SD - CG

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted] SAMPLER MOBILE [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES 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	0089_SD381	HDPE Soil Jar	200 mL	00621222089075	Grey	No	
002	0089_SD351	HDPE Soil Jar	200 mL	00621222089143	Grey	No	
003	0089_SD352	HDPE Soil Jar	200 mL	00621222089140	Grey	No	
004	0089_SD401	HDPE Soil Jar	200 mL	00621222089111	Grey	No	
005	0089_SD350	HDPE Soil Jar	200 mL	00621222089032	Grey	No	
006	0089_SD380	HDPE Soil Jar	200 mL	00621222089023	Grey	No	
007	0089_SD314	HDPE Soil Jar	200 mL	00621222089070	Grey	No	
008	0089_SD306	HDPE Soil Jar	200 mL	00621222089093	Grey	No	
009	0089_QC106	HDPE Soil Jar	200 mL	00621222089116	Grey	No	
010	0089_SD308	HDPE Soil Jar	200 mL	00621222089036	Grey	No	
011	0089_SD315	HDPE Soil Jar	200 mL	00621222089118	Grey	No	
012	0089_SD316	HDPE Soil Jar	200 mL	00621222089083	Grey	No	
013	0089_SD307	HDPE Soil Jar	200 mL	00621222089134	Grey	No	
014	0089_SD375	HDPE Soil Jar	200 mL	00621222089061	Grey	No	
015	0089_SD374	HDPE Soil Jar	200 mL	00621222089060	Grey	No	
016	0089_SD378	HDPE Soil Jar	200 mL	00621222089110	Grey	No	

Total Bottle Count: ALS: 16, Non ALS: 0

SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : **EP2403148**

Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: Customer Services EP
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
E-mail	: [redacted]stantec.com	E-mail	: ALSEnviro.Perth@alsglobal.com
Telephone	: ----	Telephone	: +61-8-9406 1301
Facsimile	: ----	Facsimile	: +61-8-9406 1399
Project	: WA_0089_PFASOMP_24	Page	: 1 of 3
Order number	: pfas-omp/Stirling	Quote number	: ES2022MWHAUS0002 (SY/139/19 B)
C-O-C number	: 64888	QC Level	: NEPM 2013 B3 & ALS QC Standard
Site	: Stirling SD - CG		
Sampler	: [redacted]		

Dates

Date Samples Received	: 12-Mar-2024 11:45	Issue Date	: 14-Mar-2024
Client Requested Due Date	: 21-Mar-2024	Scheduled Reporting Date	: **21-Mar-2024**

Delivery Details

Mode of Delivery	: Carrier	Security Seal	: Not Available
No. of coolers/boxes	: 3	Temperature	: 9.5 - Ice present
Receipt Detail	:	No. of samples received / analysed	: 16 / 16

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 see scanned COC for sample discrepencies: extra samples , samples not received etc.
- Please direct any queries related to sample condition / numbering / breakages to Sample Receipt (Samples.Perth@alsglobal.com)
- Analytical work for this work order will be conducted at ALS Environmental Perth.
- Please direct any turnaround / technical queries to the laboratory contact designated above.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months) from receipt of samples.
- **pH analysis should be conducted within 6 hours of sampling.**
- **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.**
- 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: **SOIL**

Laboratory sample ID	Sampling date / time	Sample ID	SOIL - EA055-103 Moisture Content	SOIL - EP231X (solids) PFAS - Full Suite (28 analytes)
EP2403148-001	11-Mar-2024 10:00	0089_SD381_240311	✓	✓
EP2403148-002	11-Mar-2024 10:02	0089_SD351_240311	✓	✓
EP2403148-003	11-Mar-2024 10:07	0089_SD352_240311	✓	✓
EP2403148-004	11-Mar-2024 10:08	0089_SD401_240311	✓	✓
EP2403148-005	11-Mar-2024 10:08	0089_SD350_240311	✓	✓
EP2403148-006	11-Mar-2024 10:09	0089_SD380_240311	✓	✓
EP2403148-007	11-Mar-2024 10:49	0089_SD314_240311	✓	✓
EP2403148-008	11-Mar-2024 10:49	0089_SD306_240311	✓	✓
EP2403148-009	11-Mar-2024 10:50	0089_QC106_240311	✓	✓
EP2403148-010	11-Mar-2024 10:50	0089_SD308_240311	✓	✓
EP2403148-011	11-Mar-2024 10:51	0089_SD315_240311	✓	✓
EP2403148-012	11-Mar-2024 10:52	0089_SD316_240311	✓	✓
EP2403148-013	11-Mar-2024 10:53	0089_SD307_240311	✓	✓
EP2403148-014	11-Mar-2024 14:10	0089_SD375_240311	✓	✓
EP2403148-015	11-Mar-2024 14:11	0089_SD374_240311	✓	✓
EP2403148-016	11-Mar-2024 14:12	0089_SD378_240311	✓	✓

Proactive Holding Time Report

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

Requested Deliverables

[redacted]

- A4 - AU Tax Invoice (INV)	Email	[redacted]cardno.com.au

DERP LAB REPORTS

- *AU Certificate of Analysis - NATA (COA)	Email	derp.labreports@esdat.com.au
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	derp.labreports@esdat.com.au
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	derp.labreports@esdat.com.au
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)	Email	derp.labreports@esdat.com.au
- Chain of Custody (CoC) (COC)	Email	derp.labreports@esdat.com.au
- EDI Format - ESDAT (ESDAT)	Email	derp.labreports@esdat.com.au
- EDI Format - XTab (XTAB)	Email	derp.labreports@esdat.com.au

[redacted]

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

CERTIFICATE OF ANALYSIS

Work Order	: **EP2403148**	Page	: 1 of 11
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: Customer Services EP
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: +61-8-9406 1301
Project	: WA_0089_PFASOMP_24	Date Samples Received	: 12-Mar-2024 11:45
Order number	: pfas-omp/Stirling	Date Analysis Commenced	: 15-Mar-2024
C-O-C number	: 64888	Issue Date	: 18-Mar-2024 23:09
Sampler	: [redacted] [redacted]		
Site	: Stirling SD - CG		
Quote number	: SY/139/19 B		
No. of samples received	: 16		
No. of samples analysed	: 16		

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]	Inorganics Supervisor	Perth Inorganics, Wangara, WA
[redacted]	Senior Organic Chemist	Perth Organics, Wangara, WA

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.

- 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: SEDIMENT (Matrix: SOIL)				Sample ID	0089_SD381_240311	0089_SD351_240311	0089_SD352_240311	0089_SD401_240311	0089_SD350_240311
				Sampling date / time	11-Mar-2024 10:00	11-Mar-2024 10:02	11-Mar-2024 10:07	11-Mar-2024 10:08	11-Mar-2024 10:08
Compound	CAS Number	LOR	Unit		EP2403148-001	EP2403148-002	EP2403148-003	EP2403148-004	EP2403148-005
					Result	Result	Result	Result	Result
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content	----	0.1	%		**21.7**	**21.0**	**10.3**	**23.8**	**24.6**
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	**0.0002**	<0.0002
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg		<0.001	<0.001	<0.001	<0.001	<0.001
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002

Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)				Sample ID	0089_SD381_240311	0089_SD351_240311	0089_SD352_240311	0089_SD401_240311	0089_SD350_240311
				Sampling date / time	11-Mar-2024 10:00	11-Mar-2024 10:02	11-Mar-2024 10:07	11-Mar-2024 10:08	11-Mar-2024 10:08
Compound	CAS Number	LOR	Unit		EP2403148-001	EP2403148-002	EP2403148-003	EP2403148-004	EP2403148-005
					Result	Result	Result	Result	Result
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
EP231P: PFAS Sums									
Sum of PFAS	----	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	**0.0002**	<0.0002
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	**0.0002**	<0.0002
Sum of PFAS (WA DER List)	----	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	**0.0002**	<0.0002
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.0002	%		**97.5**	**95.5**	**95.5**	**98.5**	**107**
13C8-PFOA	----	0.0002	%		**98.0**	**102**	**96.5**	**94.0**	**93.5**

Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)				Sample ID	0089_SD380_240311	0089_SD314_240311	0089_SD306_240311	0089_QC106_240311	0089_SD308_240311
				Sampling date / time	11-Mar-2024 10:09	11-Mar-2024 10:49	11-Mar-2024 10:49	11-Mar-2024 10:50	11-Mar-2024 10:50
Compound	CAS Number	LOR	Unit		EP2403148-006	EP2403148-007	EP2403148-008	EP2403148-009	EP2403148-010
					Result	Result	Result	Result	Result
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content	----	0.1	%		**25.7**	**24.3**	**19.2**	**12.4**	**17.3**
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg		<0.001	<0.001	<0.001	<0.001	<0.001
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002

Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)			Sample ID	0089_SD380_240311	0089_SD314_240311	0089_SD306_240311	0089_QC106_240311	0089_SD308_240311
			Sampling date / time	11-Mar-2024 10:09	11-Mar-2024 10:49	11-Mar-2024 10:49	11-Mar-2024 10:50	11-Mar-2024 10:50
Compound	CAS Number	LOR	Unit	EP2403148-006	EP2403148-007	EP2403148-008	EP2403148-009	EP2403148-010
				Result	Result	Result	Result	Result
EP231C: Perfluoroalkyl Sulfonamides - Continued								
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
EP231D: (n:2) Fluorotelomer Sulfonic Acids								
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
EP231P: PFAS Sums								
Sum of PFAS	----	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Sum of PFAS (WA DER List)	----	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
EP231S: PFAS Surrogate								
13C4-PFOS	----	0.0002	%	**101**	**107**	**96.0**	**85.5**	**93.5**
13C8-PFOA	----	0.0002	%	**99.0**	**95.5**	**96.5**	**98.5**	**88.5**

Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)				Sample ID	0089_SD315_240311	0089_SD316_240311	0089_SD307_240311	0089_SD375_240311	0089_SD374_240311
				Sampling date / time	11-Mar-2024 10:51	11-Mar-2024 10:52	11-Mar-2024 10:53	11-Mar-2024 14:10	11-Mar-2024 14:11
Compound	CAS Number	LOR	Unit		EP2403148-011	EP2403148-012	EP2403148-013	EP2403148-014	EP2403148-015
					Result	Result	Result	Result	Result
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content	----	0.1	%		**7.5**	**7.1**	**5.0**	**11.5**	**8.6**
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg		<0.001	<0.001	<0.001	<0.001	<0.001
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	**0.0003**	**0.0002**
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002

Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)				Sample ID	0089_SD315_240311	0089_SD316_240311	0089_SD307_240311	0089_SD375_240311	0089_SD374_240311
				Sampling date / time	11-Mar-2024 10:51	11-Mar-2024 10:52	11-Mar-2024 10:53	11-Mar-2024 14:10	11-Mar-2024 14:11
Compound	CAS Number	LOR	Unit		EP2403148-011	EP2403148-012	EP2403148-013	EP2403148-014	EP2403148-015
					Result	Result	Result	Result	Result
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
EP231P: PFAS Sums									
Sum of PFAS	----	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	**0.0003**	**0.0002**
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Sum of PFAS (WA DER List)	----	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	**0.0003**	**0.0002**
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.0002	%		**95.5**	**97.5**	**96.0**	**106**	**96.5**
13C8-PFOA	----	0.0002	%		**95.5**	**90.0**	**96.0**	**108**	**99.0**

Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)				Sample ID	0089_SD378_240311	----	----	----	----
				Sampling date / time	11-Mar-2024 14:12	----	----	----	----
Compound	CAS Number	LOR	Unit		EP2403148-016	--------	--------	--------	--------
					Result	----	----	----	----
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content	----	0.1	%		**9.6**	----	----	----	----
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg		<0.0002	----	----	----	----
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg		<0.0002	----	----	----	----
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg		<0.0002	----	----	----	----
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg		<0.0002	----	----	----	----
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg		<0.0002	----	----	----	----
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg		<0.0002	----	----	----	----
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg		<0.001	----	----	----	----
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg		**0.0003**	----	----	----	----
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg		<0.0002	----	----	----	----
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg		<0.0002	----	----	----	----
Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg		<0.0002	----	----	----	----
Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg		<0.0002	----	----	----	----
Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg		<0.0002	----	----	----	----
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg		<0.0002	----	----	----	----
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg		<0.0002	----	----	----	----
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg		<0.0002	----	----	----	----
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg		<0.0005	----	----	----	----
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg		<0.0002	----	----	----	----

Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)				Sample ID	0089_SD378_240311	----	----	----	----
				Sampling date / time	11-Mar-2024 14:12	----	----	----	----
Compound	CAS Number	LOR	Unit		EP2403148-016	--------	--------	--------	--------
					Result	----	----	----	----
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg		<0.0005	----	----	----	----
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg		<0.0005	----	----	----	----
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg		<0.0005	----	----	----	----
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg		<0.0005	----	----	----	----
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg		<0.0002	----	----	----	----
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg		<0.0002	----	----	----	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg		<0.0005	----	----	----	----
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg		<0.0005	----	----	----	----
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg		<0.0005	----	----	----	----
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg		<0.0005	----	----	----	----
EP231P: PFAS Sums									
Sum of PFAS	----	0.0002	mg/kg		**0.0003**	----	----	----	----
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg		<0.0002	----	----	----	----
Sum of PFAS (WA DER List)	----	0.0002	mg/kg		**0.0003**	----	----	----	----
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.0002	%		**97.0**	----	----	----	----
13C8-PFOA	----	0.0002	%		**93.5**	----	----	----	----

Surrogate Control Limits

Sub-Matrix: **SEDIMENT**		Recovery Limits (%)	
Compound	*CAS Number*	*Low*	*High*
EP231S: PFAS Surrogate			
13C4-PFOS	----	76	136
13C8-PFOA	----	78	131

QUALITY CONTROL REPORT

Work Order	: **EP2403148**	Page	: 1 of 7
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: Customer Services EP
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: +61-8-9406 1301
Project	: WA_0089_PFASOMP_24	Date Samples Received	: 12-Mar-2024
Order number	: pfas-omp/Stirling	Date Analysis Commenced	: 15-Mar-2024
C-O-C number	: 64888	Issue Date	: 18-Mar-2024
Sampler	: [redacted] [redacted]		
Site	: Stirling SD - CG		
Quote number	: SY/139/19 B		
No. of samples received	: 16		
No. of samples analysed	: 16		

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]	Inorganics Supervisor	Perth Inorganics, Wangara, WA
[redacted]	Senior Organic Chemist	Perth Organics, Wangara, WA

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: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
EA055: Moisture Content (Dried @ 105-110°C) (QC Lot: 5666044)									
EP2403139-001	Anonymous	EA055: Moisture Content	----	0.1	%	29.8	32.9	10.0	0% - 20%
EP2403148-005	0089_SD350_240311	EA055: Moisture Content	----	0.1	%	24.6	28.5	14.9	0% - 20%
EA055: Moisture Content (Dried @ 105-110°C) (QC Lot: 5666045)									
EP2403148-015	0089_SD374_240311	EA055: Moisture Content	----	0.1	%	8.6	9.5	10.5	0% - 20%
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 5663313)									
EP2403139-005	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
EP2403148-009	0089_QC106_240311	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 5663313)									
EP2403139-005	Anonymous	EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit

Sub-Matrix: **SOIL**

Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Laboratory Duplicate (DUP) Report					
				LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 5663313) - continued									
EP2403139-005	Anonymous	EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	<0.001	0.0	No Limit
EP2403148-009	0089_QC106_240311	EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	<0.001	0.0	No Limit
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 5663313)									
EP2403139-005	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
EP2403148-009	0089_QC106_240311	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit

Sub-Matrix: **SOIL**

				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: 5663313) - continued									
EP2403148-009	0089_QC106_240311	EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 5663313)									
EP2403139-005	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
EP2403148-009	0089_QC106_240311	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
EP231P: PFAS Sums (QC Lot: 5663313)									
EP2403139-005	Anonymous	EP231X: Sum of PFAS	----	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Sum of PFAS (WA DER List)	----	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
EP2403148-009	0089_QC106_240311	EP231X: Sum of PFAS	----	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Sum of PFAS (WA DER List)	----	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit

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: **SOIL**

				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: 5663313)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	0.0011 mg/kg	93.2	72.0	128
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	0.00125 mg/kg	87.6	73.0	123
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	0.00118 mg/kg	90.7	67.0	130
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	0.00119 mg/kg	88.2	70.0	132
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	0.00116 mg/kg	87.1	68.0	136
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	0.0012 mg/kg	90.8	59.0	134
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5663313)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	0.00625 mg/kg	91.7	71.0	135
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	0.00125 mg/kg	97.2	69.0	132
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	0.00125 mg/kg	91.6	70.0	132
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	0.00125 mg/kg	89.2	71.0	131
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	94.8	69.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	101	72.0	129
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	0.00125 mg/kg	95.2	69.0	133
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	94.4	64.0	136
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	91.2	69.0	135
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	101	66.0	139
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	0.00125 mg/kg	107	69.0	133
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5663313)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	0.00125 mg/kg	99.2	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	0.00312 mg/kg	109	59.6	143
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	0.00312 mg/kg	80.4	62.8	140
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	0.00312 mg/kg	95.7	61.5	139
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	0.00312 mg/kg	101	61.9	139
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	0.00125 mg/kg	107	63.0	144
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	0.00125 mg/kg	90.8	61.0	139
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5663313)								

Sub-Matrix: **SOIL**

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: 5663313) - continued								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	0.00117 mg/kg	102	62.0	145
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	0.00118 mg/kg	101	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	0.0012 mg/kg	103	65.0	137
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	0.0012 mg/kg	85.4	54.8	124
EP231P: PFAS Sums (QCLot: 5663313)								
EP231X: Sum of PFAS	----	0.0002	mg/kg	<0.0002	----	----	----	----
EP231X: Sum of PFHxS and PFOS	355-46-4/17 63-23-1	0.0002	mg/kg	<0.0002	----	----	----	----
EP231X: Sum of PFAS (WA DER List)	----	0.0002	mg/kg	<0.0002	----	----	----	----

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: **SOIL**

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: 5663313)							
EP2403139-006	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0011 mg/kg	100.0	72.0	128
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.00117 mg/kg	88.0	73.0	123
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.00118 mg/kg	86.9	67.0	130
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.00119 mg/kg	87.0	70.0	132
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.00116 mg/kg	87.2	68.0	136
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0012 mg/kg	93.3	59.0	134
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5663313)							
EP2403139-006	Anonymous	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.00625 mg/kg	92.2	71.0	135
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.00125 mg/kg	94.8	69.0	132
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.00125 mg/kg	92.4	70.0	132
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.00125 mg/kg	95.6	71.0	131
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.00125 mg/kg	101	69.0	133
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.00125 mg/kg	111	72.0	129
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.00125 mg/kg	92.8	69.0	133
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.00125 mg/kg	98.4	64.0	136
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.00125 mg/kg	102	69.0	135
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.00125 mg/kg	103	66.0	139
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.00125 mg/kg	102	69.0	133
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5663313)							

Sub-Matrix: **SOIL**

				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: 5663313) - continued							
EP2403139-006	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.00125 mg/kg	96.0	48.0	128
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.00312 mg/kg	98.7	60.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.00312 mg/kg	94.9	60.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.00312 mg/kg	98.1	60.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.00312 mg/kg	95.4	60.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.00125 mg/kg	106	63.0	144
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.00125 mg/kg	85.2	61.0	139
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5663313)							
EP2403139-006	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.00117 mg/kg	102	62.0	145
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.00118 mg/kg	108	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0012 mg/kg	107	65.0	137
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0012 mg/kg	102	60.0	130

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **EP2403148**	Page	: 1 of 5
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Telephone	: +61-8-9406 1301
Project	: WA_0089_PFASOMP_24	Date Samples Received	: 12-Mar-2024
Site	: Stirling SD - CG	Issue Date	: 18-Mar-2024
Sampler	: [redacted]	No. of samples received	: 16
Order number	: pfas-omp/Stirling	No. of samples analysed	: 16

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: **SOIL**

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
EA055: Moisture Content (Dried @ 105-110°C)								
HDPE Soil Jar (EA055)								
0089_SD381_240311,	0089_SD351_240311,	**11-Mar-2024**	**----**	----	----	**15-Mar-2024**	25-Mar-2024	✓
0089_SD352_240311,	0089_SD401_240311,							
0089_SD350_240311,	0089_SD380_240311,							
0089_SD314_240311,	0089_SD306_240311,							
0089_QC106_240311,	0089_SD308_240311,							
0089_SD315_240311,	0089_SD316_240311,							
0089_SD307_240311,	0089_SD375_240311,							
0089_SD374_240311,	0089_SD378_240311							
EP231A: Perfluoroalkyl Sulfonic Acids								
HDPE Soil Jar (EP231X)								
0089_SD381_240311,	0089_SD351_240311,	**11-Mar-2024**	**15-Mar-2024**	07-Sep-2024	✓	**15-Mar-2024**	24-Apr-2024	✓
0089_SD352_240311,	0089_SD401_240311,							
0089_SD350_240311,	0089_SD380_240311,							
0089_SD314_240311,	0089_SD306_240311,							
0089_QC106_240311,	0089_SD308_240311,							
0089_SD315_240311,	0089_SD316_240311,							
0089_SD307_240311,	0089_SD375_240311,							
0089_SD374_240311,	0089_SD378_240311							
EP231B: Perfluoroalkyl Carboxylic Acids								
HDPE Soil Jar (EP231X)								
0089_SD381_240311,	0089_SD351_240311,	**11-Mar-2024**	**15-Mar-2024**	07-Sep-2024	✓	**15-Mar-2024**	24-Apr-2024	✓
0089_SD352_240311,	0089_SD401_240311,							
0089_SD350_240311,	0089_SD380_240311,							
0089_SD314_240311,	0089_SD306_240311,							
0089_QC106_240311,	0089_SD308_240311,							
0089_SD315_240311,	0089_SD316_240311,							
0089_SD307_240311,	0089_SD375_240311,							
0089_SD374_240311,	0089_SD378_240311							

Matrix: **SOIL**

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 Soil Jar (EP231X)							
0089_SD381_240311, 0089_SD351_240311, 0089_SD352_240311, 0089_SD401_240311, 0089_SD350_240311, 0089_SD380_240311, 0089_SD314_240311, 0089_SD306_240311, 0089_QC106_240311, 0089_SD308_240311, 0089_SD315_240311, 0089_SD316_240311, 0089_SD307_240311, 0089_SD375_240311, 0089_SD374_240311, 0089_SD378_240311	**11-Mar-2024**	**15-Mar-2024**	07-Sep-2024	✓	**15-Mar-2024**	24-Apr-2024	✓
EP231D: (n:2) Fluorotelomer Sulfonic Acids							
HDPE Soil Jar (EP231X)							
0089_SD381_240311, 0089_SD351_240311, 0089_SD352_240311, 0089_SD401_240311, 0089_SD350_240311, 0089_SD380_240311, 0089_SD314_240311, 0089_SD306_240311, 0089_QC106_240311, 0089_SD308_240311, 0089_SD315_240311, 0089_SD316_240311, 0089_SD307_240311, 0089_SD375_240311, 0089_SD374_240311, 0089_SD378_240311	**11-Mar-2024**	**15-Mar-2024**	07-Sep-2024	✓	**15-Mar-2024**	24-Apr-2024	✓
EP231P: PFAS Sums							
HDPE Soil Jar (EP231X)							
0089_SD381_240311, 0089_SD351_240311, 0089_SD352_240311, 0089_SD401_240311, 0089_SD350_240311, 0089_SD380_240311, 0089_SD314_240311, 0089_SD306_240311, 0089_QC106_240311, 0089_SD308_240311, 0089_SD315_240311, 0089_SD316_240311, 0089_SD307_240311, 0089_SD375_240311, 0089_SD374_240311, 0089_SD378_240311	**11-Mar-2024**	**15-Mar-2024**	07-Sep-2024	✓	**15-Mar-2024**	24-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: **SOIL**

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)							
Moisture Content	EA055	3	29	**10.34**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	20	**5.00**	**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
Moisture Content	EA055	SOIL	In house: A gravimetric procedure based on weight loss over a 12 hour drying period at 105-110 degrees C. This method is compliant with NEPM Schedule B(3).
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	SOIL	In-house: Analysis of soils by solvent extraction followed by LC-Electrospray-MS-MS, Negative Mode using MRM using internal standard quantitation. Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to a portion of soil which is then extracted with MTBE and an ion pairing reagent. A portion of extract is exchanged into the analytical solvent mixture, combined with an equal volume reagent water and 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
QuECheRS Extraction of Solids	* ORG71	SOIL	In house: Sequential extractions with Acetonitrile/Methanol by shaking. Extraction efficiency aided by the addition of salts under acidic conditions. Where relevant, interferences from co-extracted organics are removed with dispersive clean-up media (dSPE). The extract is either diluted or concentrated and exchanged into the analytical solvent.

CHAIN OF CUSTODY

COC#: 64894 ALS Laboratory: EP Perth Environmental

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	[redacted] TIME: 12/3 1/41	DATE TIME:	DATE TIME:

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP_24

SITE: Stirling GW - SC

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES 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	Rinsate WATER	WA OMP Water Suite WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
001	0089_QC105		11/03/2024 11:09 AM	WATER	ALS: 3 Non ALS: 0	No		X		
002	0089_MW139		11/03/2024 11:10 AM	WATER	ALS: 3 Non ALS: 0	No		X		
003	0089_MW141	Lab QC added	11/03/2024 11:21 AM	WATER	ALS: 5 Non ALS: 0	No		X		
004	0089_MW147		11/03/2024 11:33 AM	WATER	ALS: 3 Non ALS: 0	No		X		
005	0089_MW142		11/03/2024 11:52 AM	WATER	ALS: 3 Non ALS: 0	No		X		
006	0089_MW149		11/03/2024 11:52 AM	WATER	ALS: 3 Non ALS: 0	No		X		
007	0089_MW257		11/03/2024 02:29 PM	WATER	ALS: 3 Non ALS: 0	No		X		

Environmental Division Perth

Work Order Reference EP2403149

Telephone - 61-8-9406 1301

CHAIN OF CUSTODY

(ALS) COC#: **64894** *ALS Laboratory:* EP Perth Environmental

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

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP_24

SITE: Stirling GW - SC

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted]

QUOTE NO: SY/139/19 B

SAMPLER MOBILE [redacted] / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES 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	Rinsate WATER	WA OMP Water Suite WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
008	0089_MW258		11/03/2024 02:37 PM	WATER	ALS: 3 Non ALS: 0	No		X		
009	0089_MW259		11/03/2024 02:50 PM	WATER	ALS: 5 Non ALS: 0	No		X		
010	0089_QC303		11/03/2024 03:11 PM	WATER	ALS: 2 Non ALS: 0	No	X			
011	0089_QC403		11/03/2024 03:14 PM	WATER	ALS: 2 Non ALS: 0	No	X			

CHAIN OF CUSTODY

(ALS) COC#: 64894 ALS Laboratory: EP Perth Environmental

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP_24

SITE: Stirling GW - SC

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted]

SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO [redacted]

EMAIL INVOICES TO [redacted]

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

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	0089_QC105	Clear Plastic Bottle - Natural	125 mL	00070821217512	Green	No	
001	0089_QC105	HDPE (no PTFE)	20 mL	00352309050638	Grey	No	
001	0089_QC105	HDPE (no PTFE)	20 mL	00352309050649	Grey	No	
002	0089_MW139	HDPE (no PTFE)	20 mL	00352309050630	Grey	No	
002	0089_MW139	HDPE (no PTFE)	20 mL	00352309050437	Grey	No	
002	0089_MW139	Clear Plastic Bottle - Natural	125 mL	00070821217543	Green	No	
003	0089_MW141	Clear Plastic Bottle - Natural	125 mL	00070821217553	Green	No	
003	0089_MW141	HDPE (no PTFE)	20 mL	00352309050641	Grey	No	
003	0089_MW141	HDPE (no PTFE)	20 mL	00352309050681	Grey	No	
003	0089_MW141	HDPE (no PTFE)	20 mL	00352312003766	Grey	No	
003	0089_MW141	HDPE (no PTFE)	20 mL	00352312003831	Grey	No	
004	0089_MW147	HDPE (no PTFE)	20 mL	00352309050393	Grey	No	
004	0089_MW147	Clear Plastic Bottle - Natural	125 mL	00070821217524	Green	No	
004	0089_MW147	HDPE (no PTFE)	20 mL	00352309050658	Grey	No	
005	0089_MW142	Clear Plastic Bottle - Natural	125 mL	00070821217589	Green	No	
005	0089_MW142	HDPE (no PTFE)	20 mL	00352309066039	Grey	No	
005	0089_MW142	HDPE (no PTFE)	20 mL	00352309065872	Grey	No	
006	0089_MW149	HDPE (no PTFE)	20 mL	00352309065889	Grey	No	
006	0089_MW149	HDPE (no PTFE)	20 mL	00352309065790	Grey	No	
006	0089_MW149	Clear Plastic Bottle - Natural	125 mL	00070821217580	Green	No	
007	0089_MW257	Clear Plastic Bottle - Natural	125 mL	00070821217456	Green	No	
007	0089_MW257	HDPE (no PTFE)	20 mL	00352309066015	Grey	No	
007	0089_MW257	HDPE (no PTFE)	20 mL	00352309065923	Grey	No	
008	0089_MW258	Clear Plastic Bottle - Natural	125 mL	00070821217508	Green	No	
008	0089_MW258	HDPE (no PTFE)	20 mL	00352309065902	Grey	No	
008	0089_MW258	HDPE (no PTFE)	20 mL	00352309065823	Grey	No	

CHAIN OF CUSTODY

(ALS) COC#: 64894 *ALS Laboratory:* EP Perth Environmental

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

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP_24

SITE: Stirling GW - SC

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES 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:

009	0089_MW259	Clear Plastic Bottle - Natural	125 mL	00070821217520	Green	No	
009	0089_MW259	HDPE (no PTFE)	20 mL	00352309050544	Grey	No	
009	0089_MW259	HDPE (no PTFE)	20 mL	00352309050629	Grey	No	
009	0089_MW259	HDPE (no PTFE)	20 mL	00352312004617	Grey	No	
009	0089_MW259	HDPE (no PTFE)	20 mL	00352312004070	Grey	No	
010	0089_QC303	HDPE (no PTFE)	20 mL	00352312004389	Grey	No	
010	0089_QC303	HDPE (no PTFE)	20 mL	00352312004170	Grey	No	
011	0089_QC403	HDPE (no PTFE)	20 mL	00352309065789	Grey	No	
011	0089_QC403	HDPE (no PTFE)	20 mL	00352309065859	Grey	No	

Total Bottle Count: ALS: 35, Non ALS: 0

SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : **EP2403149**

Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: Customer Services EP
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
E-mail	: [redacted]stantec.com	E-mail	: ALSEnviro.Perth@alsglobal.com
Telephone	: ----	Telephone	: +61-8-9406 1301
Facsimile	: ----	Facsimile	: +61-8-9406 1399
Project	: WA_0089_PFASOMP_24	Page	: 1 of 2
Order number	: pfas-omp/Stirling	Quote number	: ES2022MWHAUS0002 (SY/139/19 B)
C-O-C number	: 64894	QC Level	: NEPM 2013 B3 & ALS QC Standard
Site	: Stirling GW - SC		
Sampler	: [redacted]		

Dates

Date Samples Received	: 12-Mar-2024 11:45	Issue Date	: 13-Mar-2024
Client Requested Due Date	: 20-Mar-2024	Scheduled Reporting Date	: **20-Mar-2024**

Delivery Details

Mode of Delivery	: Carrier	Security Seal	: Not Available
No. of coolers/boxes	: 3	Temperature	: 9.5 - Ice present
Receipt Detail	:	No. of samples received / analysed	: 11 / 11

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 see scanned COC for sample discrepencies: extra samples , samples not received etc.
- Please direct any queries related to sample condition / numbering / breakages to Sample Receipt (Samples.Perth@alsglobal.com)
- Analytical work for this work order will be conducted at ALS Environmental Perth.
- Please direct any turnaround / technical queries to the laboratory contact designated above.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months) from receipt of samples.
- **pH analysis should be conducted within 6 hours of sampling.**
- **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.**
- 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.**

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

EP2403149-003 : 11-Mar-2024 11:21 : 0089_MW141_240311 - Lab QC added

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)	WATER - NT-01 & 02 Ca, Mg, Na, K, Cl, SO4, Alkalinity
EP2403149-001	11-Mar-2024 11:09	0089_QC105_240311	✓	✓
EP2403149-002	11-Mar-2024 11:10	0089_MW139_240311	✓	✓
EP2403149-003	11-Mar-2024 11:21	0089_MW141_240311 L...	✓	✓
EP2403149-004	11-Mar-2024 11:33	0089_MW147_240311	✓	✓
EP2403149-005	11-Mar-2024 11:52	0089_MW142_240311	✓	✓
EP2403149-006	11-Mar-2024 11:52	0089_MW149_240311	✓	✓
EP2403149-007	11-Mar-2024 14:29	0089_MW257_240311	✓	✓
EP2403149-008	11-Mar-2024 14:37	0089_MW258_240311	✓	✓
EP2403149-009	11-Mar-2024 14:50	0089_MW259_240311	✓	✓
EP2403149-010	11-Mar-2024 15:11	0089_QC303_240311	✓	
EP2403149-011	11-Mar-2024 15:14	0089_QC403_240311	✓	

Proactive Holding Time Report

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

Requested Deliverables

[redacted]
- A4 - AU Tax Invoice (INV) Email [redacted]cardno.com.au

DERP LAB REPORTS
- EDI Format - ESDAT (ESDAT) Email derp.labreports@esdat.com.au

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

CERTIFICATE OF ANALYSIS

Work Order	: **EP2403149**	Page	: 1 of 11
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: Customer Services EP
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: +61-8-9406 1301
Project	: WA_0089_PFASOMP_24	Date Samples Received	: 12-Mar-2024 11:45
Order number	: pfas-omp/Stirling	Date Analysis Commenced	: 13-Mar-2024
C-O-C number	: 64894	Issue Date	: 20-Mar-2024 23:17
Sampler	: [redacted]		
Site	: Stirling GW - SC		
Quote number	: SY/139/19 B		
No. of samples received	: 11		
No. of samples analysed	: 11		

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]	Inorganics Supervisor	Perth Inorganics, Wangara, WA
[redacted]	SENIOR LAB TECH	Perth Organics, Wangara, WA
[redacted]	Senior Organic Chemist	Perth Organics, Wangara, WA

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.
- As per QWI – EN55-3 Data Interpreting Procedures, Ionic balances are typically calculated using Major Anions - Chloride, Alkalinity and Sulfate; and Major Cations - Calcium, Magnesium, Potassium and Sodium. Where applicable and dependent upon sample matrix, the Ionic Balance may also include the additional contribution of Ammonia, Dissolved Metals by ICPMS and H+ to the Cations and Nitrate, SiO2 and Fluoride to the Anions.
- Sodium Adsorption Ratio (where reported): Where results for Na, Ca or Mg are <LOR, a concentration at half the reported LOR is incorporated into the SAR calculation. This represents a conservative approach for Na relative to the assumption that <LOR = zero concentration and a conservative approach for Ca & Mg relative to the assumption that <LOR is equivalent to the LOR concentration.
- 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.
- ED045G: The presence of Thiocyanate, Thiosulfate and Sulfite can positively contribute to the chloride result, thereby may bias results higher than expected. Results should be scrutinised accordingly.

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_QC105_240311	0089_MW139_240311	0089_MW141_240311 Lab QC added	0089_MW147_240311	0089_MW142_240311
				Sampling date / time	11-Mar-2024 11:09	11-Mar-2024 11:10	11-Mar-2024 11:21	11-Mar-2024 11:33	11-Mar-2024 11:52
Compound	CAS Number	LOR	Unit		EP2403149-001	EP2403149-002	EP2403149-003	EP2403149-004	EP2403149-005
					Result	Result	Result	Result	Result
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	<1	<1	<1	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	<1	<1	<1	<1
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		218	216	572	466	465
Total Alkalinity as CaCO3	----	1	mg/L		218	216	572	466	465
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		107	101	985	1200	1340
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		1130	1060	9980	10100	11400
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		124	121	421	339	433
Magnesium	7439-95-4	1	mg/L		82	78	689	756	860
Sodium	7440-23-5	1	mg/L		552	525	4510	5110	5870
Potassium	7440-09-7	1	mg/L		32	30	236	304	354
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		38.4	36.3	313	319	359
ø Total Cations	----	0.01	meq/L		37.8	36.1	280	309	357
ø Ionic Balance	----	0.01	%		0.91	0.36	5.65	1.59	0.28
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		<0.02	<0.02	0.49	<0.02	0.22
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		<0.02	<0.02	0.94	<0.02	0.27
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		<0.01	<0.01	16.2	0.02	3.85
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		<0.02	<0.02	0.55	<0.02	0.07
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		<0.01	<0.01	48.0	0.01	2.33
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_QC105_240311	0089_MW139_240311	0089_MW141_240311 Lab QC added	0089_MW147_240311	0089_MW142_240311
				Sampling date / time	11-Mar-2024 11:09	11-Mar-2024 11:10	11-Mar-2024 11:21	11-Mar-2024 11:33	11-Mar-2024 11:52
Compound	CAS Number	LOR	Unit		EP2403149-001	EP2403149-002	EP2403149-003	EP2403149-004	EP2403149-005
					Result	Result	Result	Result	Result
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		<0.1	<0.1	**0.3**	<0.1	**0.1**
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		<0.02	<0.02	**1.26**	<0.02	**0.41**
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		<0.02	<0.02	**13.4**	<0.02	**4.06**
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		<0.02	<0.02	**0.35**	<0.02	**0.09**
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		<0.01	<0.01	**1.07**	<0.01	**0.24**
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
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									

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_QC105_240311	0089_MW139_240311	0089_MW141_240311 Lab QC added	0089_MW147_240311	0089_MW142_240311
				Sampling date / time	11-Mar-2024 11:09	11-Mar-2024 11:10	11-Mar-2024 11:21	11-Mar-2024 11:33	11-Mar-2024 11:52
Compound	CAS Number	LOR	Unit		EP2403149-001	EP2403149-002	EP2403149-003	EP2403149-004	EP2403149-005
					Result	Result	Result	Result	Result
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
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	**82.6**	**0.03**	**11.6**
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		<0.01	<0.01	**64.2**	**0.03**	**6.18**
Sum of PFAS (WA DER List)	----	0.01	µg/L		<0.01	<0.01	**81.1**	**0.03**	**11.3**
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**105**	**108**	**109**	**102**	**101**
13C8-PFOA	----	0.02	%		**81.3**	**79.0**	**83.0**	**83.2**	**82.6**

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW149_240311	0089_MW257_240311	0089_MW258_240311	0089_MW259_240311	0089_QC303_240311
				Sampling date / time	11-Mar-2024 11:52	11-Mar-2024 14:29	11-Mar-2024 14:37	11-Mar-2024 14:50	11-Mar-2024 15:11
Compound	CAS Number	LOR	Unit		EP2403149-006	EP2403149-007	EP2403149-008	EP2403149-009	EP2403149-010
					Result	Result	Result	Result	Result
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	<1	<1	<1	----
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	<1	<1	<1	----
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		590	246	586	258	----
Total Alkalinity as CaCO3	----	1	mg/L		590	246	586	258	----
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		1120	18	112	16	----
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		7460	39	162	29	----
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		199	81	157	88	----
Magnesium	7439-95-4	1	mg/L		603	11	44	14	----
Sodium	7440-23-5	1	mg/L		3780	31	100	24	----
Potassium	7440-09-7	1	mg/L		236	5	19	3	----
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		246	6.39	18.6	6.31	----
ø Total Cations	----	0.01	meq/L		230	6.42	16.3	6.66	----
ø Ionic Balance	----	0.01	%		3.26	0.26	6.64	2.76	----
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		<0.02	<0.02	4.21	<0.02	<0.02
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		<0.02	<0.02	3.05	<0.02	<0.02
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		<0.01	1.31	11.7	0.04	<0.01
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		<0.02	0.02	0.49	<0.02	<0.02
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		<0.01	0.05	6.96	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

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW149_240311	0089_MW257_240311	0089_MW258_240311	0089_MW259_240311	0089_QC303_240311
				Sampling date / time	11-Mar-2024 11:52	11-Mar-2024 14:29	11-Mar-2024 14:37	11-Mar-2024 14:50	11-Mar-2024 15:11
Compound	CAS Number	LOR	Unit		EP2403149-006	EP2403149-007	EP2403149-008	EP2403149-009	EP2403149-010
					Result	Result	Result	Result	Result
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		<0.1	**0.1**	**1.2**	<0.1	<0.1
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		<0.02	**0.25**	**2.19**	**0.03**	<0.02
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		<0.02	**0.17**	**6.47**	**0.02**	<0.02
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		<0.02	**0.02**	**0.66**	<0.02	<0.02
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		<0.01	**0.10**	**0.58**	<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
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									

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW149_240311	0089_MW257_240311	0089_MW258_240311	0089_MW259_240311	0089_QC303_240311
				Sampling date / time	11-Mar-2024 11:52	11-Mar-2024 14:29	11-Mar-2024 14:37	11-Mar-2024 14:50	11-Mar-2024 15:11
Compound	CAS Number	LOR	Unit		EP2403149-006	EP2403149-007	EP2403149-008	EP2403149-009	EP2403149-010
					Result	Result	Result	Result	Result
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
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	**0.24**	<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	**2.02**	**37.8**	**0.17**	<0.01
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		<0.01	**1.36**	**18.7**	**0.12**	<0.01
Sum of PFAS (WA DER List)	----	0.01	µg/L		<0.01	**2.00**	**34.2**	**0.17**	<0.01
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**103**	**103**	**101**	**101**	**98.6**
13C8-PFOA	----	0.02	%		**78.9**	**85.3**	**81.1**	**77.8**	**76.2**

Analytical Results

Sub-Matrix: RINSATE (Matrix: WATER)				Sample ID	0089_QC403_240311	----	----	----	----
				Sampling date / time	11-Mar-2024 15:14	----	----	----	----
Compound	CAS Number	LOR	Unit		EP2403149-011	--------	--------	--------	--------
					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: RINSATE (Matrix: WATER)				Sample ID	0089_QC403_240311	----	----	----	----
				Sampling date / time	11-Mar-2024 15:14	----	----	----	----
Compound	CAS Number	LOR	Unit		EP2403149-011	--------	--------	--------	--------
					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	%		**96.7**	----	----	----	----
13C8-PFOA	----	0.02	%		**82.6**	----	----	----	----

Surrogate Control Limits

Sub-Matrix: **GROUNDWATER**		Recovery Limits (%)	
Compound	*CAS Number*	**Low**	**High**
EP231S: PFAS Surrogate			
13C4-PFOS	----	65	140
13C8-PFOA	----	71	133

Sub-Matrix: **RINSATE**		Recovery Limits (%)	
Compound	*CAS Number*	**Low**	**High**
EP231S: PFAS Surrogate			
13C4-PFOS	----	65	140
13C8-PFOA	----	71	133

QUALITY CONTROL REPORT

Work Order	: **EP2403149**	Page	: 1 of 13
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: Customer Services EP
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: +61-8-9406 1301
Project	: WA_0089_PFASOMP_24	Date Samples Received	: 12-Mar-2024
Order number	: pfas-omp/Stirling	Date Analysis Commenced	: 13-Mar-2024
C-O-C number	: 64894	Issue Date	: 20-Mar-2024
Sampler	: [redacted] [redacted]		
Site	: Stirling GW - SC		
Quote number	: SY/139/19 B		
No. of samples received	: 11		
No. of samples analysed	: 11		

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]	Inorganics Supervisor	Perth Inorganics, Wangara, WA
[redacted]	SENIOR LAB TECH	Perth Organics, Wangara, WA
[redacted]	Senior Organic Chemist	Perth Organics, Wangara, WA

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 (%)*
ED037P: Alkalinity by PC Titrator (QC Lot: 5662283)									
EP2403149-002	0089_MW139_240311	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	216	217	0.0	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	216	217	0.0	0% - 20%
EP2403151-002	Anonymous	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	158	158	0.0	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	158	158	0.0	0% - 20%
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QC Lot: 5660631)									
EP2403149-001	0089_QC105_240311	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	107	108	1.6	0% - 20%
EP2403151-002	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	2650	2640	0.7	0% - 20%
ED045G: Chloride by Discrete Analyser (QC Lot: 5660632)									
EP2403149-001	0089_QC105_240311	ED045G: Chloride	16887-00-6	1	mg/L	1130	1140	1.6	0% - 20%
EP2403151-002	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	19000	19900	4.5	0% - 20%
ED093F: Dissolved Major Cations (QC Lot: 5662092)									
EP2403140-001	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	552	561	1.7	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	1660	1690	1.9	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	11400	11700	2.3	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	708	728	2.8	0% - 20%
EP2403149-001	0089_QC105_240311	ED093F: Calcium	7440-70-2	1	mg/L	124	124	0.0	0% - 20%

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 (%)
ED093F: Dissolved Major Cations (QC Lot: 5662092) - continued									
EP2403149-001	0089_QC105_240311	ED093F: Magnesium	7439-95-4	1	mg/L	82	82	0.0	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	552	552	0.0	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	32	32	0.0	0% - 20%
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 5660705)									
EP2403147-024	Anonymous	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
EP2403149-003	0089_MW141_240311 Lab QC added	EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01 (0.07)*	µg/L	16.2	17.0	4.9	0% - 20%
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01 (0.07)*	µg/L	48.0	45.4	5.6	0% - 20%
		EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	0.49	0.50	3.6	0% - 20%
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	0.94	0.90	3.5	0% - 20%
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	0.55	0.52	5.4	0% - 20%
		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: 5660708)									
EP2403149-009	0089_MW259_240311	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	0.08	0.08	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
EP2403151-005	Anonymous	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
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 5660705)									
EP2403147-024	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

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: 5660705) - continued									
EP2403147-024	Anonymous	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
EP2403149-003	0089_MW141_240311 Lab QC added	EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	1.07	1.15	7.6	0% - 20%
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	1.26	1.36	7.6	0% - 20%
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02 (0.07)*	µg/L	13.4	13.6	2.0	0% - 20%
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	0.35	0.35	0.0	0% - 50%
		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	0.3	0.3	0.0	No Limit
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 5660708)									
EP2403149-009	0089_MW259_240311	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	0.03	0.03	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
EP2403151-005	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

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: 5660708) - continued									
EP2403151-005	Anonymous	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: 5660705)									
EP2403147-024	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
EP2403149-003	0089_MW141_240311 Lab QC added	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: 5660708)									
EP2403149-009	0089_MW259_240311	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

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: 5660708) - continued									
EP2403149-009	0089_MW259_240311	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
EP2403151-005	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: 5660705)									
EP2403147-024	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
EP2403149-003	0089_MW141_240311 Lab QC added	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: 5660708)									
EP2403149-009	0089_MW259_240311	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

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: 5660708) - continued									
EP2403149-009	0089_MW259_240311	EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP2403151-005	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: 5660705)									
EP2403147-024	Anonymous	EP231X: Sum of PFAS	----	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	<0.01	<0.01	0.0	No Limit
EP2403149-003	0089_MW141_240311 Lab QC added	EP231X: Sum of PFAS	----	0.01 (0.07)*	µg/L	82.6	81.1	1.8	0% - 20%
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01 (0.07)*	µg/L	64.2	62.4	2.8	0% - 20%
		EP231X: Sum of PFAS (WA DER List)	----	0.01 (0.07)*	µg/L	81.1	79.7	1.8	0% - 20%
EP231P: PFAS Sums (QC Lot: 5660708)									
EP2403149-009	0089_MW259_240311	EP231X: Sum of PFAS	----	0.01	µg/L	0.17	0.17	0.0	0% - 50%
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	0.12	0.12	0.0	0% - 50%
		EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	0.17	0.17	0.0	0% - 50%
EP2403151-005	Anonymous	EP231X: Sum of PFAS	----	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	<0.01	<0.01	0.0	No Limit

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
ED037P: Alkalinity by PC Titrator (QCLot: 5662283)								
ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	----	----	----	----
ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	----	----	----	----
ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	<1	----	----	----	----
ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	<1	20 mg/L	94.4	85.1	126
				<1	200 mg/L	101	90.5	111
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 5660631)								
ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<1	25 mg/L	98.4	89.9	112
				<1	500 mg/L	102	89.9	112
ED045G: Chloride by Discrete Analyser (QCLot: 5660632)								
ED045G: Chloride	16887-00-6	1	mg/L	<1	10 mg/L	100.0	88.6	113
				<1	1000 mg/L	108	88.6	113
ED093F: Dissolved Major Cations (QCLot: 5662092)								
ED093F: Calcium	7440-70-2	1	mg/L	<1	50 mg/L	105	86.5	117
ED093F: Magnesium	7439-95-4	1	mg/L	<1	50 mg/L	102	88.4	110
ED093F: Sodium	7440-23-5	1	mg/L	<1	50 mg/L	102	91.4	113
ED093F: Potassium	7440-09-7	1	mg/L	<1	50 mg/L	98.6	84.6	108
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5660705)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.2218 µg/L	89.3	72.0	130
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.2352 µg/L	77.0	71.0	127
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	0.2373 µg/L	81.5	68.0	131
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.238 µg/L	81.3	69.0	134
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.232 µg/L	86.0	65.0	140
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.241 µg/L	86.7	53.0	142
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5660708)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.2218 µg/L	90.8	72.0	130
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.2352 µg/L	77.8	71.0	127
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	0.2373 µg/L	81.8	68.0	131
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.238 µg/L	76.7	69.0	134
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.232 µg/L	86.6	65.0	140
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.241 µg/L	82.6	53.0	142

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: 5660705)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	1.25 µg/L	91.6	73.0	129
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	0.25 µg/L	92.0	72.0	129
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	0.25 µg/L	101	72.0	129
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	0.25 µg/L	88.0	72.0	130
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	0.25 µg/L	89.6	71.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	0.25 µg/L	95.2	69.0	130
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	0.25 µg/L	94.0	71.0	129
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	0.25 µg/L	97.2	69.0	133
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	0.25 µg/L	88.0	72.0	134
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	0.25 µg/L	90.0	65.0	144
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	0.25 µg/L	91.8	71.0	132
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5660708)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	1.25 µg/L	104	73.0	129
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	0.25 µg/L	90.4	72.0	129
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	0.25 µg/L	107	72.0	129
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	0.25 µg/L	95.0	72.0	130
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	0.25 µg/L	94.0	71.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	0.25 µg/L	94.6	69.0	130
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	0.25 µg/L	89.4	71.0	129
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	0.25 µg/L	86.6	69.0	133
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	0.25 µg/L	84.0	72.0	134
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	0.25 µg/L	84.0	65.0	144
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	0.25 µg/L	94.6	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5660705)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.25 µg/L	84.8	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	0.625 µg/L	104	68.0	141
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	0.625 µg/L	97.4	60.5	138
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	0.625 µg/L	92.1	68.3	134
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	0.625 µg/L	81.0	62.2	138
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	0.25 µg/L	111	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

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: 5660708)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.25 µg/L	86.6	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	0.625 µg/L	104	68.0	141
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	0.625 µg/L	73.4	60.5	138
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	0.625 µg/L	98.8	68.3	134
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	0.625 µg/L	81.8	62.2	138
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	0.25 µg/L	102	65.0	136
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	0.25 µg/L	90.4	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5660705)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.2343 µg/L	92.8	63.0	143
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	0.2378 µg/L	96.7	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	0.24 µg/L	100	67.0	138
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	0.241 µg/L	78.8	64.2	133
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5660708)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.2343 µg/L	104	63.0	143
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	0.2378 µg/L	106	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	0.24 µg/L	103	67.0	138
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	0.241 µg/L	85.7	64.2	133
EP231P: PFAS Sums (QCLot: 5660705)								
EP231X: Sum of PFAS	----	0.01	µg/L	<0.01	----	----	----	----
EP231X: Sum of PFHxS and PFOS	355-46-4/17 63-23-1	0.01	µg/L	<0.01	----	----	----	----
EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	<0.01	----	----	----	----
EP231P: PFAS Sums (QCLot: 5660708)								
EP231X: Sum of PFAS	----	0.01	µg/L	<0.01	----	----	----	----
EP231X: Sum of PFHxS and PFOS	355-46-4/17 63-23-1	0.01	µg/L	<0.01	----	----	----	----
EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	<0.01	----	----	----	----

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**

Matrix Spike (MS) Report

Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*Concentration*	*MS*	*Low*	*High*
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 5660631)							
EP2403149-001	0089_QC105_240311	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	100 mg/L	98.8	70.4	130
ED045G: Chloride by Discrete Analyser (QCLot: 5660632)							
EP2403149-001	0089_QC105_240311	ED045G: Chloride	16887-00-6	200 mg/L	# Not Determined	70.0	130
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5660705)							
EP2403147-026	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.2218 µg/L	94.2	72.0	129
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.232 µg/L	79.7	71.0	127
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.2352 µg/L	85.9	68.0	129
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.238 µg/L	79.8	69.0	134
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.232 µg/L	87.5	65.0	140
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.241 µg/L	89.2	53.0	129
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5660708)							
EP2403151-004	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.2218 µg/L	99.0	72.0	129
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.232 µg/L	77.6	71.0	127
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.2352 µg/L	84.0	68.0	129
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.238 µg/L	74.6	69.0	134
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.232 µg/L	91.3	65.0	140
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.241 µg/L	90.0	53.0	129
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5660705)							
EP2403147-026	Anonymous	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	1.25 µg/L	94.1	73.0	142
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.25 µg/L	89.5	72.0	129
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.25 µg/L	103	72.0	129
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.25 µg/L	87.2	72.0	130
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.25 µg/L	97.8	71.0	133
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.25 µg/L	97.2	69.0	130
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.25 µg/L	89.2	71.0	134
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.25 µg/L	94.8	69.0	133
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.25 µg/L	93.0	72.0	134
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.25 µg/L	84.4	65.0	144
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.25 µg/L	95.0	71.0	132
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5660708)							
EP2403151-004	Anonymous	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	1.25 µg/L	107	73.0	142
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.25 µg/L	87.8	72.0	129
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.25 µg/L	110	72.0	129
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.25 µg/L	95.4	72.0	130
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.25 µg/L	99.0	71.0	133
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.25 µg/L	91.4	69.0	130
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.25 µg/L	86.6	71.0	134

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: 5660708) - continued							
EP2403151-004	Anonymous	EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.25 µg/L	86.0	69.0	133
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.25 µg/L	87.4	72.0	134
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.25 µg/L	95.6	65.0	144
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.25 µg/L	104	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5660705)							
EP2403147-026	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.25 µg/L	85.8	59.0	135
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.625 µg/L	110	70.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.625 µg/L	91.4	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.625 µg/L	92.1	70.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.625 µg/L	87.9	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.25 µg/L	91.8	65.0	136
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.25 µg/L	85.8	61.0	135
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5660708)							
EP2403151-004	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.25 µg/L	85.4	59.0	135
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.625 µg/L	107	70.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.625 µg/L	98.5	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.625 µg/L	98.3	70.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.625 µg/L	94.1	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.25 µg/L	94.4	65.0	136
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.25 µg/L	99.4	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5660705)							
EP2403147-026	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.234 µg/L	96.2	63.0	143
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.2378 µg/L	99.3	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.24 µg/L	102	67.0	138
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.2415 µg/L	79.1	70.0	130
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5660708)							
EP2403151-004	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.234 µg/L	101	63.0	143
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.2378 µg/L	114	64.0	140

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: 5660708) - continued							
EP2403151-004	Anonymous	EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.24 µg/L	111	67.0	138
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.2415 µg/L	94.0	70.0	130

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **EP2403149**	Page	: 1 of 6
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Telephone	: +61-8-9406 1301
Project	: WA_0089_PFASOMP_24	Date Samples Received	: 12-Mar-2024
Site	: Stirling GW - SC	Issue Date	: 20-Mar-2024
Sampler	: [redacted]	No. of samples received	: 11
Order number	: pfas-omp/Stirling	No. of samples analysed	: 11

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.**
- **Matrix Spike outliers exist - please see following pages for full details.**
- **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.**

Outliers : Quality Control Samples

Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

Matrix: **WATER**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
Matrix Spike (MS) Recoveries							
ED045G: Chloride by Discrete Analyser	EP2403149--001	0089_QC105_240311	**Chloride**	16887-00-6	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**

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
ED037P: Alkalinity by PC Titrator							
Clear Plastic Bottle - Natural (ED037-P)							
0089_QC105_240311, 0089_MW139_240311, 0089_MW141_240311 - Lab QC added, 0089_MW147_240311, 0089_MW142_240311, 0089_MW149_240311, 0089_MW257_240311, 0089_MW258_240311, 0089_MW259_240311	**11-Mar-2024**	**----**	----	----	**15-Mar-2024**	25-Mar-2024	✓
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA							
Clear Plastic Bottle - Natural (ED041G)							
0089_QC105_240311, 0089_MW139_240311, 0089_MW141_240311 - Lab QC added, 0089_MW147_240311, 0089_MW142_240311, 0089_MW149_240311, 0089_MW257_240311, 0089_MW258_240311, 0089_MW259_240311	**11-Mar-2024**	**----**	----	----	**20-Mar-2024**	08-Apr-2024	✓
ED045G: Chloride by Discrete Analyser							
Clear Plastic Bottle - Natural (ED045G)							
0089_QC105_240311, 0089_MW139_240311, 0089_MW141_240311 - Lab QC added, 0089_MW147_240311, 0089_MW142_240311, 0089_MW149_240311, 0089_MW257_240311, 0089_MW258_240311, 0089_MW259_240311	**11-Mar-2024**	**----**	----	----	**20-Mar-2024**	08-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
ED093F: Dissolved Major Cations							
Clear Plastic Bottle - Natural (ED093F)							
0089_QC105_240311, 0089_MW139_240311, 0089_MW141_240311 - Lab QC added, 0089_MW147_240311, 0089_MW142_240311, 0089_MW149_240311, 0089_MW257_240311, 0089_MW258_240311, 0089_MW259_240311	**11-Mar-2024**	**----**	----	**----**	**15-Mar-2024**	18-Mar-2024	✓
EP231A: Perfluoroalkyl Sulfonic Acids							
HDPE (no PTFE) (EP231X)							
0089_QC105_240311, 0089_MW139_240311, 0089_MW141_240311 - Lab QC added, 0089_MW147_240311, 0089_MW142_240311, 0089_MW149_240311, 0089_MW257_240311, 0089_MW258_240311, 0089_MW259_240311, 0089_QC303_240311, 0089_QC403_240311	**11-Mar-2024**	**14-Mar-2024**	07-Sep-2024	✓	**14-Mar-2024**	07-Sep-2024	✓
EP231B: Perfluoroalkyl Carboxylic Acids							
HDPE (no PTFE) (EP231X)							
0089_QC105_240311, 0089_MW139_240311, 0089_MW141_240311 - Lab QC added, 0089_MW147_240311, 0089_MW142_240311, 0089_MW149_240311, 0089_MW257_240311, 0089_MW258_240311, 0089_MW259_240311, 0089_QC303_240311, 0089_QC403_240311	**11-Mar-2024**	**14-Mar-2024**	07-Sep-2024	✓	**14-Mar-2024**	07-Sep-2024	✓
EP231C: Perfluoroalkyl Sulfonamides							
HDPE (no PTFE) (EP231X)							
0089_QC105_240311, 0089_MW139_240311, 0089_MW141_240311 - Lab QC added, 0089_MW147_240311, 0089_MW142_240311, 0089_MW149_240311, 0089_MW257_240311, 0089_MW258_240311, 0089_MW259_240311, 0089_QC303_240311, 0089_QC403_240311	**11-Mar-2024**	**14-Mar-2024**	07-Sep-2024	✓	**14-Mar-2024**	07-Sep-2024	✓
EP231D: (n:2) Fluorotelomer Sulfonic Acids							
HDPE (no PTFE) (EP231X)							
0089_QC105_240311, 0089_MW139_240311, 0089_MW141_240311 - Lab QC added, 0089_MW147_240311, 0089_MW142_240311, 0089_MW149_240311, 0089_MW257_240311, 0089_MW258_240311, 0089_MW259_240311, 0089_QC303_240311, 0089_QC403_240311	**11-Mar-2024**	**14-Mar-2024**	07-Sep-2024	✓	**14-Mar-2024**	07-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)							
0089_QC105_240311, 0089_MW139_240311, 0089_MW141_240311 - Lab QC added, 0089_MW147_240311, 0089_MW142_240311, 0089_MW149_240311, 0089_MW257_240311, 0089_MW258_240311, 0089_MW259_240311, 0089_QC303_240311, 0089_QC403_240311	**11-Mar-2024**	**14-Mar-2024**	07-Sep-2024	✓	**14-Mar-2024**	07-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)							
Alkalinity by Auto Titrator	ED037-P	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	4	39	**10.26**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Alkalinity by Auto Titrator	ED037-P	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	39	**5.13**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Alkalinity by Auto Titrator	ED037-P	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	39	**5.13**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Chloride by Discrete Analyser	ED045G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	39	**5.13**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	20	**5.00**	**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
Alkalinity by Auto Titrator	ED037-P	WATER	In house: Referenced to APHA 2320 B This procedure determines alkalinity by automated measurement (e.g. PC Titrate) on a settled supernatant aliquot of the sample using pH 4.5 for indicating the total alkalinity end-point. This method is compliant with NEPM Schedule B(3)
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	WATER	In house: Referenced to APHA 4500-SO4. Dissolved sulfate is determined in a 0.45um filtered sample. Sulfate ions are converted to a barium sulfate suspension in an acetic acid medium with barium chloride. Light absorbance of the BaSO4 suspension is measured by a photometer and the SO4-2 concentration is determined by comparison of the reading with a standard curve. This method is compliant with NEPM Schedule B(3)
Chloride by Discrete Analyser	ED045G	WATER	In house: Referenced to APHA 4500 Cl - G.The thiocyanate ion is liberated from mercuric thiocyanate through sequestration of mercury by the chloride ion to form non-ionised mercuric chloride. In the presence of ferric ions the liberated thiocynate forms highly-coloured ferric thiocynate which is measured at 480 nm.
Major Cations - Dissolved	ED093F	WATER	In house: Referenced to APHA 3120 and 3125; USEPA SW 846 - 6010 and 6020; Cations are determined by either ICP-AES or ICP-MS techniques. This method is compliant with NEPM Schedule B(3) Sodium Adsorption Ratio is calculated from Ca, Mg and Na which determined by ALS in house method QWI-EN/ED093F. This method is compliant with NEPM Schedule B(3) Hardness parameters are calculated based on APHA 2340 B. This method is compliant with NEPM Schedule B(3)
Ionic Balance by PCT DA and Turbi SO4 DA	* EN055 - PG	WATER	In house: Referenced to APHA 1030F. This method is compliant with NEPM Schedule B(3)
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.

CHAIN OF CUSTODY

ALS COC#: 64895 ALS Laboratory: EP Perth Environmental

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP_24

SITE: Stirling SD - SC

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted] CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

PRIMARY SAMPLER: [redacted] QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO: [redacted]

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME: 11/3 1145	DATE TIME:	DATE TIME:

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 Sediments SEDIMENT	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
001	0089_SD329		11/03/2024 12:21 PM	SOIL	ALS: 1 Non ALS: 0	No	X		
002	0089_SD358		11/03/2024 12:21 PM	SOIL	ALS: 1 Non ALS: 0	No	X		
003	0089_QC108		11/03/2024 12:21 PM	SOIL	ALS: 1 Non ALS: 0	No	X		
004	0089_SD330		11/03/2024 12:22 PM	SOIL	ALS: 1 Non ALS: 0	No	X		
005	0089_SD357		11/03/2024 12:22 PM	SOIL	ALS: 1 Non ALS: 0	No	X		
006	0089_SD356		11/03/2024 12:22 PM	SOIL	ALS: 1 Non ALS: 0	No	X		
007	0089_SD331		11/03/2024 12:23 PM	SOIL	ALS: 1 Non ALS: 0	No	X		

Environmental Division
Perth
Work Order Reference
EP2403150

Telephone : 61-8-9406 1301

CHAIN OF CUSTODY

COC#: **64895** *ALS Laboratory:* EP Perth Environmental

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

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP_24

SITE: Stirling SD - SC

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES 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	0089_SD329	HDPE Soil Jar	200 mL	00621222089045	Grey	No	
002	0089_SD358	HDPE Soil Jar	200 mL	00621222089114	Grey	No	
003	0089_QC108	HDPE Soil Jar	200 mL	00621222089131	Grey	No	
004	0089_SD330	HDPE Soil Jar	200 mL	00621222089109	Grey	No	
005	0089_SD357	HDPE Soil Jar	200 mL	00621222089088	Grey	No	
006	0089_SD356	HDPE Soil Jar	200 mL	00621222089121	Grey	No	
007	0089_SD331	HDPE Soil Jar	200 mL	00621222089044	Grey	No	

Total Bottle Count: ALS: 7, Non ALS: 0

SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : **EP2403150**

Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: Customer Services EP
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
E-mail	: [redacted]stantec.com	E-mail	: ALSEnviro.Perth@alsglobal.com
Telephone	: ----	Telephone	: +61-8-9406 1301
Facsimile	: ----	Facsimile	: +61-8-9406 1399
Project	: WA_0089_PFASOMP_24	Page	: 1 of 2
Order number	: pfas-omp/Stirling	Quote number	: ES2022MWHAUS0002 (SY/139/19 B)
C-O-C number	: 64895	QC Level	: NEPM 2013 B3 & ALS QC Standard
Site	: Stirling SD - SC		
Sampler	: [redacted]		

Dates

Date Samples Received	: 12-Mar-2024 11:45	Issue Date	: 14-Mar-2024
Client Requested Due Date	: 21-Mar-2024	Scheduled Reporting Date	: **21-Mar-2024**

Delivery Details

Mode of Delivery	: Carrier	Security Seal	: Not Available
No. of coolers/boxes	: 3	Temperature	: 9.5 - Ice present
Receipt Detail	:	No. of samples received / analysed	: 7 / 7

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 see scanned COC for sample discrepencies: extra samples , samples not received etc.
- Please direct any queries related to sample condition / numbering / breakages to Sample Receipt (Samples.Perth@alsglobal.com)
- Analytical work for this work order will be conducted at ALS Environmental Perth.
- Please direct any turnaround / technical queries to the laboratory contact designated above.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months) from receipt of samples.
- **pH analysis should be conducted within 6 hours of sampling.**
- **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.**
- 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: **SOIL**

Laboratory sample ID	Sampling date / time	Sample ID	SOIL - EA055-103 Moisture Content	SOIL - EP231X (solids) PFAS - Full Suite (28 analytes)
EP2403150-001	11-Mar-2024 12:21	0089_SD329_240311	✓	✓
EP2403150-002	11-Mar-2024 12:21	0089_SD358_240311	✓	✓
EP2403150-003	11-Mar-2024 12:21	0089_QC108_240311	✓	✓
EP2403150-004	11-Mar-2024 12:22	0089_SD330_240311	✓	✓
EP2403150-005	11-Mar-2024 12:22	0089_SD357_240311	✓	✓
EP2403150-006	11-Mar-2024 12:22	0089_SD356_240311	✓	✓
EP2403150-007	11-Mar-2024 12:23	0089_SD331_240311	✓	✓

Proactive Holding Time Report

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

Requested Deliverables

[redacted]
- A4 - AU Tax Invoice (INV) — Email — [redacted]cardno.com.au

DERP LAB REPORTS
- EDI Format - ESDAT (ESDAT) — Email — derp.labreports@esdat.com.au

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

CERTIFICATE OF ANALYSIS

Work Order	: **EP2403150**	Page	: 1 of 7
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: Customer Services EP
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: +61-8-9406 1301
Project	: WA_0089_PFASOMP_24	Date Samples Received	: 12-Mar-2024 11:45
Order number	: pfas-omp/Stirling	Date Analysis Commenced	: 15-Mar-2024
C-O-C number	: 64895	Issue Date	: 21-Mar-2024 22:56
Sampler	: [redacted]		
Site	: Stirling SD - SC		
Quote number	: SY/139/19 B		
No. of samples received	: 7		
No. of samples analysed	: 7		

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]	Inorganics Analyst	Perth Inorganics, Wangara, WA
[redacted]	Senior Organic Chemist	Perth Organics, Wangara, WA

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.

- 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: SEDIMENT (Matrix: SOIL)				Sample ID	0089_SD329_240311	0089_SD358_240311	0089_QC108_240311	0089_SD330_240311	0089_SD357_240311
				Sampling date / time	11-Mar-2024 12:21	11-Mar-2024 12:21	11-Mar-2024 12:21	11-Mar-2024 12:22	11-Mar-2024 12:22
Compound	CAS Number	LOR	Unit		EP2403150-001	EP2403150-002	EP2403150-003	EP2403150-004	EP2403150-005
					Result	Result	Result	Result	Result
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content	----	0.1	%		**27.8**	**27.7**	**33.5**	**26.8**	**29.9**
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg		<0.001	<0.001	<0.001	<0.001	<0.001
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002

Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)				Sample ID	0089_SD329_240311	0089_SD358_240311	0089_QC108_240311	0089_SD330_240311	0089_SD357_240311
				Sampling date / time	11-Mar-2024 12:21	11-Mar-2024 12:21	11-Mar-2024 12:21	11-Mar-2024 12:22	11-Mar-2024 12:22
Compound	CAS Number	LOR	Unit		EP2403150-001	EP2403150-002	EP2403150-003	EP2403150-004	EP2403150-005
					Result	Result	Result	Result	Result
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
EP231P: PFAS Sums									
Sum of PFAS	----	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Sum of PFAS (WA DER List)	----	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.0002	%		**99.5**	**118**	**90.5**	**102**	**103**
13C8-PFOA	----	0.0002	%		**100**	**111**	**91.5**	**97.0**	**108**

Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)				Sample ID	0089_SD356_240311	0089_SD331_240311	----	----	----
				Sampling date / time	11-Mar-2024 12:22	11-Mar-2024 12:23	----	----	----
Compound	CAS Number	LOR	Unit		EP2403150-006	EP2403150-007	--------	--------	--------
					Result	Result	----	----	----
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content	----	0.1	%		**31.6**	**28.6**	----	----	----
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg		<0.0002	<0.0002	----	----	----
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg		<0.0002	<0.0002	----	----	----
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg		<0.0002	<0.0002	----	----	----
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg		<0.0002	<0.0002	----	----	----
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg		<0.0002	<0.0002	----	----	----
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg		<0.0002	<0.0002	----	----	----
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg		<0.001	<0.001	----	----	----
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg		<0.0002	<0.0002	----	----	----
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg		<0.0002	<0.0002	----	----	----
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg		<0.0002	<0.0002	----	----	----
Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg		<0.0002	<0.0002	----	----	----
Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg		<0.0002	<0.0002	----	----	----
Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg		<0.0002	<0.0002	----	----	----
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg		<0.0002	<0.0002	----	----	----
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg		<0.0002	<0.0002	----	----	----
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg		<0.0002	<0.0002	----	----	----
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg		<0.0005	<0.0005	----	----	----
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg		<0.0002	<0.0002	----	----	----

Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)				Sample ID	0089_SD356_240311	0089_SD331_240311	----	----	----
				Sampling date / time	11-Mar-2024 12:22	11-Mar-2024 12:23	----	----	----
Compound	CAS Number	LOR	Unit		EP2403150-006	EP2403150-007	--------	--------	--------
					Result	Result	----	----	----
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg		<0.0005	<0.0005	----	----	----
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg		<0.0005	<0.0005	----	----	----
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg		<0.0005	<0.0005	----	----	----
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg		<0.0005	<0.0005	----	----	----
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg		<0.0002	<0.0002	----	----	----
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg		<0.0002	<0.0002	----	----	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg		<0.0005	<0.0005	----	----	----
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg		<0.0005	<0.0005	----	----	----
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg		<0.0005	<0.0005	----	----	----
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg		<0.0005	<0.0005	----	----	----
EP231P: PFAS Sums									
Sum of PFAS	----	0.0002	mg/kg		<0.0002	<0.0002	----	----	----
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg		<0.0002	<0.0002	----	----	----
Sum of PFAS (WA DER List)	----	0.0002	mg/kg		<0.0002	<0.0002	----	----	----
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.0002	%		**99.0**	**93.5**	----	----	----
13C8-PFOA	----	0.0002	%		**108**	**98.5**	----	----	----

Surrogate Control Limits

Sub-Matrix: **SEDIMENT**		Recovery Limits (%)	
Compound	*CAS Number*	*Low*	*High*
EP231S: PFAS Surrogate			
13C4-PFOS	----	76	136
13C8-PFOA	----	78	131

QUALITY CONTROL REPORT

Work Order	: **EP2403150**	Page	: 1 of 12
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: Customer Services EP
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: +61-8-9406 1301
Project	: WA_0089_PFASOMP_24	Date Samples Received	: 12-Mar-2024
Order number	: pfas-omp/Stirling	Date Analysis Commenced	: 15-Mar-2024
C-O-C number	: 64895	Issue Date	: 21-Mar-2024
Sampler	: [redacted] [redacted]		
Site	: Stirling SD - SC		
Quote number	: SY/139/19 B		
No. of samples received	: 7		
No. of samples analysed	: 7		

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]	Inorganics Analyst	Perth Inorganics, Wangara, WA
[redacted]	Senior Organic Chemist	Perth Organics, Wangara, WA

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: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
EA055: Moisture Content (Dried @ 105-110°C) (QC Lot: 5666045)									
EP2403148-015	Anonymous	EA055: Moisture Content	----	0.1	%	8.6	9.5	10.5	0% - 20%
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 5663313)									
EP2403139-005	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
EP2403148-009	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 5664832)									
EP2403150-003	0089_QC108_240311	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
EP2403346-001	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit

Sub-Matrix: **SOIL**

				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: 5664832) - continued									
EP2403346-001	Anonymous	EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 5663313)									
EP2403139-005	Anonymous	EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	<0.001	0.0	No Limit
EP2403148-009	Anonymous	EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	<0.001	0.0	No Limit
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 5664832)									
EP2403150-003	0089_QC108_240311	EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit

Sub-Matrix: **SOIL**

				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: 5664832) - continued									
EP2403150-003	0089_QC108_240311	EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	<0.001	0.0	No Limit
EP2403346-001	Anonymous	EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	<0.001	0.0	No Limit
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 5663313)									
EP2403139-005	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
EP2403148-009	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit

Sub-Matrix: **SOIL**

				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: 5663313) - continued									
EP2403148-009	Anonymous	EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 5664832)									
EP2403150-003	0089_QC108_240311	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
EP2403346-001	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 5663313)									
EP2403139-005	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
EP2403148-009	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit

Sub-Matrix: **SOIL**

				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: 5663313) - continued									
EP2403148-009	Anonymous	EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 5664832)									
EP2403150-003	0089_QC108_240311	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
EP2403346-001	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
EP231P: PFAS Sums (QC Lot: 5663313)									
EP2403139-005	Anonymous	EP231X: Sum of PFAS	----	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Sum of PFAS (WA DER List)	----	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
EP2403148-009	Anonymous	EP231X: Sum of PFAS	----	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Sum of PFAS (WA DER List)	----	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
EP231P: PFAS Sums (QC Lot: 5664832)									
EP2403150-003	0089_QC108_240311	EP231X: Sum of PFAS	----	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Sum of PFAS (WA DER List)	----	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
EP2403346-001	Anonymous	EP231X: Sum of PFAS	----	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231P: PFAS Sums (QC Lot: 5664832) - continued									
EP2403346-001	Anonymous	EP231X: Sum of PFAS (WA DER List)	----	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit

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: **SOIL**

				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: 5663313)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	0.0011 mg/kg	93.2	72.0	128
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	0.00125 mg/kg	87.6	73.0	123
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	0.00118 mg/kg	90.7	67.0	130
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	0.00119 mg/kg	88.2	70.0	132
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	0.00116 mg/kg	87.1	68.0	136
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	0.0012 mg/kg	90.8	59.0	134
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5664832)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	0.0011 mg/kg	98.2	72.0	128
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	0.00125 mg/kg	86.8	73.0	123
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	0.00118 mg/kg	90.2	67.0	130
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	0.00119 mg/kg	89.9	70.0	132
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	0.00116 mg/kg	88.4	68.0	136
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	0.0012 mg/kg	87.9	59.0	134
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5663313)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	0.00625 mg/kg	91.7	71.0	135
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	0.00125 mg/kg	97.2	69.0	132
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	0.00125 mg/kg	91.6	70.0	132
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	0.00125 mg/kg	89.2	71.0	131
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	94.8	69.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	101	72.0	129
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	0.00125 mg/kg	95.2	69.0	133
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	94.4	64.0	136
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	91.2	69.0	135
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	101	66.0	139
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	0.00125 mg/kg	107	69.0	133
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5664832)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	0.00625 mg/kg	76.4	71.0	135
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	0.00125 mg/kg	101	69.0	132
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	0.00125 mg/kg	94.4	70.0	132
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	0.00125 mg/kg	93.6	71.0	131

Sub-Matrix: **SOIL**

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: 5664832) - continued								
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	98.4	69.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	97.6	72.0	129
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	0.00125 mg/kg	89.6	69.0	133
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	104	64.0	136
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	86.4	69.0	135
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	90.4	66.0	139
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	0.00125 mg/kg	99.2	69.0	133
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5663313)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	0.00125 mg/kg	99.2	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	0.00312 mg/kg	109	59.6	143
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	0.00312 mg/kg	80.4	62.8	140
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	0.00312 mg/kg	95.7	61.5	139
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	0.00312 mg/kg	101	61.9	139
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	0.00125 mg/kg	107	63.0	144
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	0.00125 mg/kg	90.8	61.0	139
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5664832)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	0.00125 mg/kg	88.8	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	0.00312 mg/kg	91.0	59.6	143
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	0.00312 mg/kg	93.8	62.8	140
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	0.00312 mg/kg	90.9	61.5	139
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	0.00312 mg/kg	94.1	61.9	139
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	0.00125 mg/kg	90.0	63.0	144
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	0.00125 mg/kg	92.4	61.0	139
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5663313)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	0.00117 mg/kg	102	62.0	145
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	0.00118 mg/kg	101	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	0.0012 mg/kg	103	65.0	137
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	0.0012 mg/kg	85.4	54.8	124

Sub-Matrix: **SOIL**

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: 5664832)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	0.00117 mg/kg	101	62.0	145
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	0.00118 mg/kg	95.8	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	0.0012 mg/kg	98.8	65.0	137
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	0.0012 mg/kg	86.2	54.8	124
EP231P: PFAS Sums (QCLot: 5663313)								
EP231X: Sum of PFAS	----	0.0002	mg/kg	<0.0002	----	----	----	----
EP231X: Sum of PFHxS and PFOS	355-46-4/17 63-23-1	0.0002	mg/kg	<0.0002	----	----	----	----
EP231X: Sum of PFAS (WA DER List)	----	0.0002	mg/kg	<0.0002	----	----	----	----
EP231P: PFAS Sums (QCLot: 5664832)								
EP231X: Sum of PFAS	----	0.0002	mg/kg	<0.0002	----	----	----	----
EP231X: Sum of PFHxS and PFOS	355-46-4/17 63-23-1	0.0002	mg/kg	<0.0002	----	----	----	----
EP231X: Sum of PFAS (WA DER List)	----	0.0002	mg/kg	<0.0002	----	----	----	----

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: **SOIL**

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: 5663313)							
EP2403139-006	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0011 mg/kg	100.0	72.0	128
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.00117 mg/kg	88.0	73.0	123
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.00118 mg/kg	86.9	67.0	130
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.00119 mg/kg	87.0	70.0	132
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.00116 mg/kg	87.2	68.0	136
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0012 mg/kg	93.3	59.0	134
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5664832)							
EP2403150-004	0089_SD330_240311	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0011 mg/kg	91.8	72.0	128
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.00117 mg/kg	82.5	73.0	123
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.00118 mg/kg	89.4	67.0	130
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.00119 mg/kg	92.8	70.0	132
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.00116 mg/kg	90.5	68.0	136
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0012 mg/kg	88.3	59.0	134
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5663313)							

Sub-Matrix: **SOIL**

				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: 5663313) - continued							
EP2403139-006	Anonymous	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.00625 mg/kg	92.2	71.0	135
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.00125 mg/kg	94.8	69.0	132
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.00125 mg/kg	92.4	70.0	132
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.00125 mg/kg	95.6	71.0	131
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.00125 mg/kg	101	69.0	133
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.00125 mg/kg	111	72.0	129
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.00125 mg/kg	92.8	69.0	133
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.00125 mg/kg	98.4	64.0	136
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.00125 mg/kg	102	69.0	135
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.00125 mg/kg	103	66.0	139
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.00125 mg/kg	102	69.0	133
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5664832)							
EP2403150-004	0089_SD330_240311	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.00625 mg/kg	105	71.0	135
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.00125 mg/kg	92.8	69.0	132
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.00125 mg/kg	97.2	70.0	132
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.00125 mg/kg	96.4	71.0	131
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.00125 mg/kg	100	69.0	133
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.00125 mg/kg	94.8	72.0	129
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.00125 mg/kg	91.2	69.0	133
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.00125 mg/kg	102	64.0	136
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.00125 mg/kg	94.8	69.0	135
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.00125 mg/kg	89.2	66.0	139
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.00125 mg/kg	95.6	69.0	133
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5663313)							
EP2403139-006	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.00125 mg/kg	96.0	48.0	128
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.00312 mg/kg	98.7	60.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.00312 mg/kg	94.9	60.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.00312 mg/kg	98.1	60.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.00312 mg/kg	95.4	60.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.00125 mg/kg	106	63.0	144
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.00125 mg/kg	85.2	61.0	139
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5664832)							
EP2403150-004	0089_SD330_240311	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.00125 mg/kg	92.8	48.0	128

Sub-Matrix: **SOIL**

				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: 5664832) - continued							
EP2403150-004	0089_SD330_240311	EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.00312 mg/kg	101	60.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.00312 mg/kg	105	60.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.00312 mg/kg	87.7	60.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.00312 mg/kg	86.2	60.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.00125 mg/kg	100	63.0	144
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.00125 mg/kg	86.0	61.0	139
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5663313)							
EP2403139-006	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.00117 mg/kg	102	62.0	145
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.00118 mg/kg	108	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0012 mg/kg	107	65.0	137
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0012 mg/kg	102	60.0	130
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5664832)							
EP2403150-004	0089_SD330_240311	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.00117 mg/kg	98.8	62.0	145
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.00118 mg/kg	96.6	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0012 mg/kg	104	65.0	137
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0012 mg/kg	91.6	60.0	130

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **EP2403150**	Page	: 1 of 5
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Telephone	: +61-8-9406 1301
Project	: WA_0089_PFASOMP_24	Date Samples Received	: 12-Mar-2024
Site	: Stirling SD - SC	Issue Date	: 21-Mar-2024
Sampler	: [redacted]	No. of samples received	: 7
Order number	: pfas-omp/Stirling	No. of samples analysed	: 7

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: **SOIL**

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
EA055: Moisture Content (Dried @ 105-110°C)							
HDPE Soil Jar (EA055)							
0089_SD329_240311, 0089_SD358_240311, 0089_QC108_240311, 0089_SD330_240311, 0089_SD357_240311, 0089_SD356_240311, 0089_SD331_240311	**11-Mar-2024**	**----**	----	----	**15-Mar-2024**	25-Mar-2024	✓
EP231A: Perfluoroalkyl Sulfonic Acids							
HDPE Soil Jar (EP231X)							
0089_SD329_240311, 0089_SD358_240311, 0089_QC108_240311, 0089_SD330_240311, 0089_SD357_240311, 0089_SD356_240311, 0089_SD331_240311	**11-Mar-2024**	**15-Mar-2024**	07-Sep-2024	✓	**15-Mar-2024**	24-Apr-2024	✓
EP231B: Perfluoroalkyl Carboxylic Acids							
HDPE Soil Jar (EP231X)							
0089_SD329_240311, 0089_SD358_240311, 0089_QC108_240311, 0089_SD330_240311, 0089_SD357_240311, 0089_SD356_240311, 0089_SD331_240311	**11-Mar-2024**	**15-Mar-2024**	07-Sep-2024	✓	**15-Mar-2024**	24-Apr-2024	✓
EP231C: Perfluoroalkyl Sulfonamides							
HDPE Soil Jar (EP231X)							
0089_SD329_240311, 0089_SD358_240311, 0089_QC108_240311, 0089_SD330_240311, 0089_SD357_240311, 0089_SD356_240311, 0089_SD331_240311	**11-Mar-2024**	**15-Mar-2024**	07-Sep-2024	✓	**15-Mar-2024**	24-Apr-2024	✓
EP231D: (n:2) Fluorotelomer Sulfonic Acids							
HDPE Soil Jar (EP231X)							
0089_SD329_240311, 0089_SD358_240311, 0089_QC108_240311, 0089_SD330_240311, 0089_SD357_240311, 0089_SD356_240311, 0089_SD331_240311	**11-Mar-2024**	**15-Mar-2024**	07-Sep-2024	✓	**15-Mar-2024**	24-Apr-2024	✓

Matrix: **SOIL**

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 Soil Jar (EP231X)							
0089_SD329_240311, 0089_SD358_240311, 0089_QC108_240311, 0089_SD330_240311, 0089_SD357_240311, 0089_SD356_240311, 0089_SD331_240311	**11-Mar-2024**	**15-Mar-2024**	07-Sep-2024	✓	**15-Mar-2024**	24-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: **SOIL**

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)							
Moisture Content	EA055	1	9	**11.11**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	4	38	**10.53**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	38	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	38	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	38	**5.26**	**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
Moisture Content	EA055	SOIL	In house: A gravimetric procedure based on weight loss over a 12 hour drying period at 105-110 degrees C. This method is compliant with NEPM Schedule B(3).
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	SOIL	In-house: Analysis of soils by solvent extraction followed by LC-Electrospray-MS-MS, Negative Mode using MRM using internal standard quantitation. Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to a portion of soil which is then extracted with MTBE and an ion pairing reagent. A portion of extract is exchanged into the analytical solvent mixture, combined with an equal volume reagent water and 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
QuECheRS Extraction of Solids	* ORG71	SOIL	In house: Sequential extractions with Acetonitrile/Methanol by shaking. Extraction efficiency aided by the addition of salts under acidic conditions. Where relevant, interferences from co-extracted organics are removed with dispersive clean-up media (dSPE). The extract is either diluted or concentrated and exchanged into the analytical solvent.

CHAIN OF CUSTODY

COC#: 64896 ALS Laboratory: EP Perth Environmental

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME: 12/3 1145	DATE TIME:	DATE TIME:

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP_24

SITE: Stirling SW/PW - SC

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES 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	WA OMP Water Suite WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
001	0089_QC107		11/03/2024 12:24 PM	WATER	ALS: 3 Non ALS: 0	No	X		
002	0089_PW330		11/03/2024 12:25 PM	WATER	ALS: 3 Non ALS: 0	No	X		
003	0089_SW156		11/03/2024 12:25 PM	WATER	ALS: 3 Non ALS: 0	No	X		
004	0089_PW331	Lab QC added	11/03/2024 12:26 PM	WATER	ALS: 5 Non ALS: 0	No	X		
005	0089_SW152	Lab QC added	11/03/2024 12:28 PM	WATER	ALS: 5 Non ALS: 0	No	X		
006	0089_PW358		11/03/2024 12:29 PM	WATER	ALS: 3 Non ALS: 0	No	X		
007	0089_PW356		11/03/2024 12:30 PM	WATER	ALS: 3 Non ALS: 0	No	X		

Environmental Division Perth

Work Order Reference

EP2403151

Telephone - 61-8-9406 1301

CHAIN OF CUSTODY

COC#: **64896** *ALS Laboratory:* EP Perth Environmental

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

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP_24

SITE: Stirling SW/PW - SC

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES 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	WA OMP Water Suite WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
008	0089_PW329		11/03/2024 12:30 PM	WATER	ALS: 3 Non ALS: 0	No	X		
009	0089_SW150		11/03/2024 12:31 PM	WATER	ALS: 3 Non ALS: 0	No	X		
010	0089_PW357		11/03/2024 12:32 PM	WATER	ALS: 3 Non ALS: 0	No	X		
011	0089_SW154		11/03/2024 12:33 PM	WATER	ALS: 3 Non ALS: 0	No	X		

CHAIN OF CUSTODY

COC#: 64896 ALS Laboratory: EP Perth Environmental

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

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP_24

SITE: Stirling SW/PW - SC

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES 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	0089_QC107	Clear Plastic Bottle - Natural	125 mL	00070821217598	Green	No	
001	0089_QC107	HDPE (no PTFE)	20 mL	00352309050588	Grey	No	
001	0089_QC107	HDPE (no PTFE)	20 mL	00352309050589	Grey	No	
002	0089_PW330	HDPE (no PTFE)	20 mL	00352309050513	Grey	No	
002	0089_PW330	HDPE (no PTFE)	20 mL	00352309050654	Grey	No	
002	0089_PW330	Clear Plastic Bottle - Natural	125 mL	00070821217569	Green	No	
003	0089_SW156	Clear Plastic Bottle - Natural	125 mL	00070821217496	Green	No	
003	0089_SW156	HDPE (no PTFE)	20 mL	00352309050677	Grey	No	
003	0089_SW156	HDPE (no PTFE)	20 mL	00352309050401	Grey	No	
004	0089_PW331	Clear Plastic Bottle - Natural	125 mL	00070821217546	Green	No	
004	0089_PW331	HDPE (no PTFE)	20 mL	00352309050643	Grey	No	
004	0089_PW331	HDPE (no PTFE)	20 mL	00352309050502	Grey	No	
004	0089_PW331	HDPE (no PTFE)	20 mL	00352312003790	Grey	No	
004	0089_PW331	HDPE (no PTFE)	20 mL	00352312004110	Grey	No	
005	0089_SW152	HDPE (no PTFE)	20 mL	00352309050452	Grey	No	
005	0089_SW152	HDPE (no PTFE)	20 mL	00352309050438	Grey	No	
005	0089_SW152	Clear Plastic Bottle - Natural	125 mL	00070821217620	Green	No	
005	0089_SW152	HDPE (no PTFE)	20 mL	00352312004160	Grey	No	
005	0089_SW152	HDPE (no PTFE)	20 mL	00352312004533	Grey	No	
006	0089_PW358	HDPE (no PTFE)	20 mL	00352309050590	Grey	No	
006	0089_PW358	HDPE (no PTFE)	20 mL	00352309050484	Grey	No	
006	0089_PW358	Clear Plastic Bottle - Natural	125 mL	00070821217570	Green	No	
007	0089_PW356	Clear Plastic Bottle - Natural	125 mL	00070821217616	Green	No	
007	0089_PW356	HDPE (no PTFE)	20 mL	00352309050607	Grey	No	
007	0089_PW356	HDPE (no PTFE)	20 mL	00352309050584	Grey	No	
008	0089_PW329	Clear Plastic Bottle - Natural	125 mL	00070821217608	Green	No	

CHAIN OF CUSTODY

COC#: **64896** *ALS Laboratory:* EP Perth Environmental

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

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP_24

SITE: Stirling SW/PW - SC

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES 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:			

008	0089_PW329	HDPE (no PTFE)	20 mL	00352309050666	Grey	No	
008	0089_PW329	HDPE (no PTFE)	20 mL	00352309050618	Grey	No	
009	0089_SW150	Clear Plastic Bottle - Natural	125 mL	00070821217606	Green	No	
009	0089_SW150	HDPE (no PTFE)	20 mL	00352309050567	Grey	No	
009	0089_SW150	HDPE (no PTFE)	20 mL	00352309050668	Grey	No	
010	0089_PW357	Clear Plastic Bottle - Natural	125 mL	00070821217575	Green	No	
010	0089_PW357	HDPE (no PTFE)	20 mL	00352309050496	Grey	No	
010	0089_PW357	HDPE (no PTFE)	20 mL	00352309050495	Grey	No	
011	0089_SW154	Clear Plastic Bottle - Natural	125 mL	00070821217585	Green	No	
011	0089_SW154	HDPE (no PTFE)	20 mL	00352309050579	Grey	No	
011	0089_SW154	HDPE (no PTFE)	20 mL	00352309050545	Grey	No	

Total Bottle Count: ALS: 37, Non ALS: 0

SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : **EP2403151**

Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: Customer Services EP
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
E-mail	: [redacted]stantec.com	E-mail	: ALSEnviro.Perth@alsglobal.com
Telephone	: ----	Telephone	: +61-8-9406 1301
Facsimile	: ----	Facsimile	: +61-8-9406 1399
Project	: WA_0089_PFASOMP_24	Page	: 1 of 2
Order number	: pfas-omp/Stirling	Quote number	: ES2022MWHAUS0002 (SY/139/19 B)
C-O-C number	: 64896	QC Level	: NEPM 2013 B3 & ALS QC Standard
Site	: Stirling SW/PW - SC		
Sampler	: [redacted]		

Dates

Date Samples Received	: 12-Mar-2024 11:45	Issue Date	: 13-Mar-2024
Client Requested Due Date	: 20-Mar-2024	Scheduled Reporting Date	: **20-Mar-2024**

Delivery Details

Mode of Delivery	: Carrier	Security Seal	: Not Available
No. of coolers/boxes	: 3	Temperature	: 9.5 - Ice present
Receipt Detail	:	No. of samples received / analysed	: 11 / 11

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 see scanned COC for sample discrepencies: extra samples , samples not received etc.
- Please direct any queries related to sample condition / numbering / breakages to Sample Receipt (Samples.Perth@alsglobal.com)
- Analytical work for this work order will be conducted at ALS Environmental Perth.
- Please direct any turnaround / technical queries to the laboratory contact designated above.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months) from receipt of samples.
- **pH analysis should be conducted within 6 hours of sampling.**
- **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.**
- 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.**

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

EP2403151-004 : 11-Mar-2024 12:26 : 0089_PW331_240311 - Lab QC added
EP2403151-005 : 11-Mar-2024 12:28 : 0089_SW152_240311 - Lab QC added

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)	WATER - NT-01 & 02 Ca, Mg, Na, K, Cl, SO4, Alkalinity
EP2403151-001	11-Mar-2024 12:24	0089_QC107_240311	✓	✓
EP2403151-002	11-Mar-2024 12:25	0089_PW330_240311	✓	✓
EP2403151-003	11-Mar-2024 12:25	0089_SW156_240311	✓	✓
EP2403151-004	11-Mar-2024 12:26	0089_PW331_240311 L...	✓	✓
EP2403151-005	11-Mar-2024 12:28	0089_SW152_240311 L...	✓	✓
EP2403151-006	11-Mar-2024 12:29	0089_PW358_240311	✓	✓
EP2403151-007	11-Mar-2024 12:30	0089_PW356_240311	✓	✓
EP2403151-008	11-Mar-2024 12:30	0089_PW329_240311	✓	✓
EP2403151-009	11-Mar-2024 12:31	0089_SW150_240311	✓	✓
EP2403151-010	11-Mar-2024 12:32	0089_PW357_240311	✓	✓
EP2403151-011	11-Mar-2024 12:33	0089_SW154_240311	✓	✓

Proactive Holding Time Report

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

Requested Deliverables

[redacted]
- A4 - AU Tax Invoice (INV) Email [redacted]cardno.com.au

DERP LAB REPORTS
- EDI Format - ESDAT (ESDAT) Email derp.labreports@esdat.com.au

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

CERTIFICATE OF ANALYSIS

Work Order	: **EP2403151**	Page	: 1 of 12
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: Customer Services EP
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: +61-8-9406 1301
Project	: WA_0089_PFASOMP_24	Date Samples Received	: 12-Mar-2024 11:45
Order number	: pfas-omp/Stirling	Date Analysis Commenced	: 13-Mar-2024
C-O-C number	: 64896	Issue Date	: 20-Mar-2024 23:20
Sampler	: [redacted]		
Site	: Stirling SW/PW - SC		
Quote number	: SY/139/19 B		
No. of samples received	: 11		
No. of samples analysed	: 11		

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]	Inorganics Supervisor	Perth Inorganics, Wangara, WA
[redacted]	Senior Organic Chemist	Perth Organics, Wangara, WA

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.
- As per QWI – EN55-3 Data Interpreting Procedures, Ionic balances are typically calculated using Major Anions - Chloride, Alkalinity and Sulfate; and Major Cations - Calcium, Magnesium, Potassium and Sodium. Where applicable and dependent upon sample matrix, the Ionic Balance may also include the additional contribution of Ammonia, Dissolved Metals by ICPMS and H+ to the Cations and Nitrate, SiO2 and Fluoride to the Anions.
- Sodium Adsorption Ratio (where reported): Where results for Na, Ca or Mg are <LOR, a concentration at half the reported LOR is incorporated into the SAR calculation. This represents a conservative approach for Na relative to the assumption that <LOR = zero concentration and a conservative approach for Ca & Mg relative to the assumption that <LOR is equivalent to the LOR concentration.
- 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.
- ED045G: The presence of Thiocyanate, Thiosulfate and Sulfite can positively contribute to the chloride result, thereby may bias results higher than expected. Results should be scrutinised accordingly.

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)

Compound	CAS Number	LOR	Unit	Sample ID	0089_QC107_240311	0089_PW330_240311	0089_SW156_240311	0089_PW331_240311 Lab QC added	0089_SW152_240311 Lab QC added
				Sampling date / time	11-Mar-2024 12:24	11-Mar-2024 12:25	11-Mar-2024 12:25	11-Mar-2024 12:26	11-Mar-2024 12:28
					EP2403151-001	EP2403151-002	EP2403151-003	EP2403151-004	EP2403151-005
					Result	Result	Result	Result	Result
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	<1	<1	<1	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	<1	<1	<1	<1
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		124	158	124	124	124
Total Alkalinity as CaCO3	----	1	mg/L		124	158	124	124	124
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		2630	2650	2640	2630	2580
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		18800	19000	19100	19300	20500
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		495	522	484	504	510
Magnesium	7439-95-4	1	mg/L		1570	1590	1540	1600	1620
Sodium	7440-23-5	1	mg/L		12100	12200	11800	12400	12500
Potassium	7440-09-7	1	mg/L		655	661	636	673	678
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		588	594	596	602	634
ø Total Cations	----	0.01	meq/L		697	704	680	713	720
ø Ionic Balance	----	0.01	%		8.52	8.48	6.60	8.50	6.30
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	0.04	<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

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)

Compound	CAS Number	LOR	Unit	Sample ID	0089_QC107_240311	0089_PW330_240311	0089_SW156_240311	0089_PW331_240311 Lab QC added	0089_SW152_240311 Lab QC added
				Sampling date / time	11-Mar-2024 12:24	11-Mar-2024 12:25	11-Mar-2024 12:25	11-Mar-2024 12:26	11-Mar-2024 12:28
					EP2403151-001	EP2403151-002	EP2403151-003	EP2403151-004	EP2403151-005
					Result	Result	Result	Result	Result
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
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									

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_QC107_240311	0089_PW330_240311	0089_SW156_240311	0089_PW331_240311 Lab QC added	0089_SW152_240311 Lab QC added
				Sampling date / time	11-Mar-2024 12:24	11-Mar-2024 12:25	11-Mar-2024 12:25	11-Mar-2024 12:26	11-Mar-2024 12:28
Compound	CAS Number	LOR	Unit		EP2403151-001	EP2403151-002	EP2403151-003	EP2403151-004	EP2403151-005
					Result	Result	Result	Result	Result
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
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	**0.04**	<0.01	<0.01
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		<0.01	<0.01	**0.04**	<0.01	<0.01
Sum of PFAS (WA DER List)	----	0.01	µg/L		<0.01	<0.01	**0.04**	<0.01	<0.01
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**102**	**98.8**	**98.3**	**105**	**106**
13C8-PFOA	----	0.02	%		**84.1**	**78.2**	**81.1**	**82.1**	**80.7**

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_PW358_240311	0089_PW356_240311	0089_PW329_240311	0089_SW150_240311	0089_PW357_240311
				Sampling date / time	11-Mar-2024 12:29	11-Mar-2024 12:30	11-Mar-2024 12:30	11-Mar-2024 12:31	11-Mar-2024 12:32
Compound	CAS Number	LOR	Unit		EP2403151-006	EP2403151-007	EP2403151-008	EP2403151-009	EP2403151-010
					Result	Result	Result	Result	Result
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	<1	<1	<1	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	<1	<1	<1	<1
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		121	130	132	124	162
Total Alkalinity as CaCO3	----	1	mg/L		121	130	132	124	162
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		2640	2640	2690	2690	2640
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		19900	19600	20000	19600	19200
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		471	490	499	499	521
Magnesium	7439-95-4	1	mg/L		1510	1540	1580	1580	1600
Sodium	7440-23-5	1	mg/L		10600	11900	12200	12200	12400
Potassium	7440-09-7	1	mg/L		611	642	663	661	676
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		619	610	623	611	600
ø Total Cations	----	0.01	meq/L		624	685	702	702	714
ø Ionic Balance	----	0.01	%		0.46	5.77	6.02	6.94	8.72
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	0.02	<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	0.02	0.01
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_PW358_240311	0089_PW356_240311	0089_PW329_240311	0089_SW150_240311	0089_PW357_240311
				Sampling date / time	11-Mar-2024 12:29	11-Mar-2024 12:30	11-Mar-2024 12:30	11-Mar-2024 12:31	11-Mar-2024 12:32
Compound	CAS Number	LOR	Unit		EP2403151-006	EP2403151-007	EP2403151-008	EP2403151-009	EP2403151-010
					Result	Result	Result	Result	Result
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
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									

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_PW358_240311	0089_PW356_240311	0089_PW329_240311	0089_SW150_240311	0089_PW357_240311
				Sampling date / time	11-Mar-2024 12:29	11-Mar-2024 12:30	11-Mar-2024 12:30	11-Mar-2024 12:31	11-Mar-2024 12:32
Compound	CAS Number	LOR	Unit		EP2403151-006	EP2403151-007	EP2403151-008	EP2403151-009	EP2403151-010
					Result	Result	Result	Result	Result
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
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	**0.04**	**0.01**
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		<0.01	<0.01	<0.01	**0.04**	**0.01**
Sum of PFAS (WA DER List)	----	0.01	µg/L		<0.01	<0.01	<0.01	**0.04**	**0.01**
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**111**	**110**	**101**	**99.6**	**103**
13C8-PFOA	----	0.02	%		**84.0**	**83.4**	**88.7**	**74.7**	**79.8**

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_SW154_240311	----	----	----	----
				Sampling date / time	11-Mar-2024 12:33	----	----	----	----
Compound	CAS Number	LOR	Unit		EP2403151-011	--------	--------	--------	--------
					Result	----	----	----	----
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	----	----	----	----
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	----	----	----	----
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		**124**	----	----	----	----
Total Alkalinity as CaCO3	----	1	mg/L		**124**	----	----	----	----
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		**2710**	----	----	----	----
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		**19000**	----	----	----	----
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		**487**	----	----	----	----
Magnesium	7439-95-4	1	mg/L		**1580**	----	----	----	----
Sodium	7440-23-5	1	mg/L		**11100**	----	----	----	----
Potassium	7440-09-7	1	mg/L		**642**	----	----	----	----
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		**595**	----	----	----	----
ø Total Cations	----	0.01	meq/L		**654**	----	----	----	----
ø Ionic Balance	----	0.01	%		**4.70**	----	----	----	----
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	----	----	----	----

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_SW154_240311	----	----	----	----
				Sampling date / time	11-Mar-2024 12:33	----	----	----	----
Compound	CAS Number	LOR	Unit		EP2403151-011	--------	--------	--------	--------
					Result	----	----	----	----
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	----	----	----	----
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									

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_SW154_240311	----	----	----	----
				Sampling date / time	11-Mar-2024 12:33	----	----	----	----
Compound	CAS Number	LOR	Unit		EP2403151-011	--------	--------	--------	--------
					Result	----	----	----	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
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	%		**105**	----	----	----	----
13C8-PFOA	----	0.02	%		**79.1**	----	----	----	----

Surrogate Control Limits

Sub-Matrix: SURFACE WATER		Recovery Limits (%)	
Compound	CAS Number	Low	High
EP231S: PFAS Surrogate			
13C4-PFOS	----	65	140
13C8-PFOA	----	71	133

QUALITY CONTROL REPORT

Work Order	: **EP2403151**	Page	: 1 of 9
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: Customer Services EP
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: +61-8-9406 1301
Project	: WA_0089_PFASOMP_24	Date Samples Received	: 12-Mar-2024
Order number	: pfas-omp/Stirling	Date Analysis Commenced	: 13-Mar-2024
C-O-C number	: 64896	Issue Date	: 20-Mar-2024
Sampler	: [redacted] [redacted]		
Site	: Stirling SW/PW - SC		
Quote number	: SY/139/19 B		
No. of samples received	: 11		
No. of samples analysed	: 11		

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]	Inorganics Supervisor	Perth Inorganics, Wangara, WA
[redacted]	Senior Organic Chemist	Perth Organics, Wangara, WA

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 (%)
ED037P: Alkalinity by PC Titrator (QC Lot: 5662283)									
EP2403149-002	Anonymous	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	216	217	0.0	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	216	217	0.0	0% - 20%
EP2403151-002	0089_PW330_240311	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	158	158	0.0	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	158	158	0.0	0% - 20%
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QC Lot: 5660631)									
EP2403149-001	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	107	108	1.6	0% - 20%
EP2403151-002	0089_PW330_240311	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	2650	2640	0.7	0% - 20%
ED045G: Chloride by Discrete Analyser (QC Lot: 5660632)									
EP2403149-001	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	1130	1140	1.6	0% - 20%
EP2403151-002	0089_PW330_240311	ED045G: Chloride	16887-00-6	1	mg/L	19000	19900	4.5	0% - 20%
ED093F: Dissolved Major Cations (QC Lot: 5660387)									
EP2403147-021	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	480	487	1.4	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	1520	1540	0.9	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	11700	11800	0.8	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	629	635	1.0	0% - 20%
EP2403151-005	0089_SW152_240311 Lab QC added	ED093F: Calcium	7440-70-2	1	mg/L	510	529	3.6	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	1620	1670	3.2	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 (%)*
ED093F: Dissolved Major Cations (QC Lot: 5660387) - continued									
EP2403151-005	0089_SW152_240311 Lab QC added	ED093F: Sodium	7440-23-5	1	mg/L	12500	13000	3.5	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	678	706	4.0	0% - 20%
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 5660708)									
EP2403149-009	Anonymous	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	0.08	0.08	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
EP2403151-005	0089_SW152_240311 Lab QC added	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
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 5660708)									
EP2403149-009	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	0.03	0.03	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
EP2403151-005	0089_SW152_240311 Lab QC added	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

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: 5660708) - continued									
EP2403151-005	0089_SW152_240311 Lab QC added	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: 5660708)									
EP2403149-009	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
EP2403151-005	0089_SW152_240311 Lab QC added	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: 5660708)									
EP2403149-009	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

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: 5660708) - continued									
EP2403151-005	0089_SW152_240311 Lab QC added	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: 5660708)									
EP2403149-009	Anonymous	EP231X: Sum of PFAS	----	0.01	µg/L	0.17	0.17	0.0	0% - 50%
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	0.12	0.12	0.0	0% - 50%
		EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	0.17	0.17	0.0	0% - 50%
EP2403151-005	0089_SW152_240311 Lab QC added	EP231X: Sum of PFAS	----	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	<0.01	<0.01	0.0	No Limit

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
ED037P: Alkalinity by PC Titrator (QCLot: 5662283)								
ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	----	----	----	----
ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	----	----	----	----
ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	<1	----	----	----	----
ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	<1	20 mg/L	94.4	85.1	126
				<1	200 mg/L	101	90.5	111
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 5660631)								
ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<1	25 mg/L	98.4	89.9	112
				<1	500 mg/L	102	89.9	112
ED045G: Chloride by Discrete Analyser (QCLot: 5660632)								
ED045G: Chloride	16887-00-6	1	mg/L	<1	10 mg/L	100.0	88.6	113
				<1	1000 mg/L	108	88.6	113
ED093F: Dissolved Major Cations (QCLot: 5660387)								
ED093F: Calcium	7440-70-2	1	mg/L	<1	50 mg/L	105	86.5	117
ED093F: Magnesium	7439-95-4	1	mg/L	<1	50 mg/L	97.8	88.4	110
ED093F: Sodium	7440-23-5	1	mg/L	<1	50 mg/L	98.3	91.4	113
ED093F: Potassium	7440-09-7	1	mg/L	<1	50 mg/L	95.6	84.6	108
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5660708)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.2218 µg/L	90.8	72.0	130
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.2352 µg/L	77.8	71.0	127
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	0.2373 µg/L	81.8	68.0	131
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.238 µg/L	76.7	69.0	134
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.232 µg/L	86.6	65.0	140
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.241 µg/L	82.6	53.0	142
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5660708)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	1.25 µg/L	104	73.0	129
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	0.25 µg/L	90.4	72.0	129
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	0.25 µg/L	107	72.0	129
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	0.25 µg/L	95.0	72.0	130
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	0.25 µg/L	94.0	71.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	0.25 µg/L	94.6	69.0	130

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
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5660708) - continued								
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	0.25 µg/L	89.4	71.0	129
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	0.25 µg/L	86.6	69.0	133
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	0.25 µg/L	84.0	72.0	134
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	0.25 µg/L	84.0	65.0	144
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	0.25 µg/L	94.6	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5660708)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.25 µg/L	86.6	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	0.625 µg/L	104	68.0	141
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	0.625 µg/L	73.4	60.5	138
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	0.625 µg/L	98.8	68.3	134
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	0.625 µg/L	81.8	62.2	138
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	0.25 µg/L	102	65.0	136
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	0.25 µg/L	90.4	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5660708)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.2343 µg/L	104	63.0	143
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	0.2378 µg/L	106	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	0.24 µg/L	103	67.0	138
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	0.241 µg/L	85.7	64.2	133
EP231P: PFAS Sums (QCLot: 5660708)								
EP231X: Sum of PFAS	----	0.01	µg/L	<0.01	----	----	----	----
EP231X: Sum of PFHxS and PFOS	355-46-4/17 63-23-1	0.01	µg/L	<0.01	----	----	----	----
EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	<0.01	----	----	----	----

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
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 5660631)							
EP2403149-001	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	100 mg/L	98.8	70.4	130

Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*Concentration*	*MS*	*Low*	*High*
ED045G: Chloride by Discrete Analyser (QCLot: 5660632)							
EP2403149-001	Anonymous	ED045G: Chloride	16887-00-6	200 mg/L	# Not Determined	70.0	130
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5660708)							
EP2403151-004	0089_PW331_240311 Lab QC added	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.2218 µg/L	99.0	72.0	129
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.232 µg/L	77.6	71.0	127
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.2352 µg/L	84.0	68.0	129
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.238 µg/L	74.6	69.0	134
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.232 µg/L	91.3	65.0	140
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.241 µg/L	90.0	53.0	129
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5660708)							
EP2403151-004	0089_PW331_240311 Lab QC added	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	1.25 µg/L	107	73.0	142
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.25 µg/L	87.8	72.0	129
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.25 µg/L	110	72.0	129
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.25 µg/L	95.4	72.0	130
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.25 µg/L	99.0	71.0	133
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.25 µg/L	91.4	69.0	130
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.25 µg/L	86.6	71.0	134
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.25 µg/L	86.0	69.0	133
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.25 µg/L	87.4	72.0	134
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.25 µg/L	95.6	65.0	144
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.25 µg/L	104	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5660708)							
EP2403151-004	0089_PW331_240311 Lab QC added	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.25 µg/L	85.4	59.0	135
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.625 µg/L	107	70.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.625 µg/L	98.5	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.625 µg/L	98.3	70.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.625 µg/L	94.1	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.25 µg/L	94.4	65.0	136
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.25 µg/L	99.4	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5660708)							
EP2403151-004	0089_PW331_240311 Lab QC added	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.234 µg/L	101	63.0	143
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.2378 µg/L	114	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.24 µg/L	111	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: 5660708) - continued							
EP2403151-004	0089_PW331_240311 Lab QC added	EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.2415 µg/L	94.0	70.0	130

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **EP2403151**	Page	: 1 of 6
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Telephone	: +61-8-9406 1301
Project	: WA_0089_PFASOMP_24	Date Samples Received	: 12-Mar-2024
Site	: Stirling SW/PW - SC	Issue Date	: 20-Mar-2024
Sampler	: [redacted]	No. of samples received	: 11
Order number	: pfas-omp/Stirling	No. of samples analysed	: 11

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.**
- **Matrix Spike outliers exist - please see following pages for full details.**
- **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.**

Outliers : Quality Control Samples

Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

Matrix: **WATER**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
Matrix Spike (MS) Recoveries							
ED045G: Chloride by Discrete Analyser	EP2403149--001	Anonymous	**Chloride**	16887-00-6	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**

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
ED037P: Alkalinity by PC Titrator							
Clear Plastic Bottle - Natural (ED037-P)							
0089_QC107_240311, 0089_PW330_240311, 0089_SW156_240311, 0089_PW331_240311 - Lab QC added, 0089_SW152_240311 - Lab QC added, 0089_PW358_240311, 0089_PW356_240311, 0089_PW329_240311, 0089_SW150_240311, 0089_PW357_240311, 0089_SW154_240311	**11-Mar-2024**	**----**	----	----	**15-Mar-2024**	25-Mar-2024	✓
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA							
Clear Plastic Bottle - Natural (ED041G)							
0089_QC107_240311, 0089_PW330_240311, 0089_SW156_240311, 0089_PW331_240311 - Lab QC added, 0089_SW152_240311 - Lab QC added, 0089_PW358_240311, 0089_PW356_240311, 0089_PW329_240311, 0089_SW150_240311, 0089_PW357_240311, 0089_SW154_240311	**11-Mar-2024**	**----**	----	----	**20-Mar-2024**	08-Apr-2024	✓
ED045G: Chloride by Discrete Analyser							
Clear Plastic Bottle - Natural (ED045G)							
0089_QC107_240311, 0089_PW330_240311, 0089_SW156_240311, 0089_PW331_240311 - Lab QC added, 0089_SW152_240311 - Lab QC added, 0089_PW358_240311, 0089_PW356_240311, 0089_PW329_240311, 0089_SW150_240311, 0089_PW357_240311, 0089_SW154_240311	**11-Mar-2024**	**----**	----	----	**20-Mar-2024**	08-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
ED093F: Dissolved Major Cations							
Clear Plastic Bottle - Natural (ED093F)							
0089_QC107_240311, 0089_SW156_240311, 0089_SW152_240311 - Lab QC added, 0089_PW356_240311, 0089_SW150_240311, 0089_SW154_240311, 0089_PW330_240311, 0089_PW331_240311 - Lab QC added, 0089_PW358_240311, 0089_PW329_240311, 0089_PW357_240311,	**11-Mar-2024**	**----**	----	**----**	**15-Mar-2024**	18-Mar-2024	✓
EP231A: Perfluoroalkyl Sulfonic Acids							
HDPE (no PTFE) (EP231X)							
0089_QC107_240311, 0089_SW156_240311, 0089_SW152_240311 - Lab QC added, 0089_PW356_240311, 0089_SW150_240311, 0089_SW154_240311, 0089_PW330_240311, 0089_PW331_240311 - Lab QC added, 0089_PW358_240311, 0089_PW329_240311, 0089_PW357_240311,	**11-Mar-2024**	**14-Mar-2024**	07-Sep-2024	✓	**14-Mar-2024**	07-Sep-2024	✓
EP231B: Perfluoroalkyl Carboxylic Acids							
HDPE (no PTFE) (EP231X)							
0089_QC107_240311, 0089_SW156_240311, 0089_SW152_240311 - Lab QC added, 0089_PW356_240311, 0089_SW150_240311, 0089_SW154_240311, 0089_PW330_240311, 0089_PW331_240311 - Lab QC added, 0089_PW358_240311, 0089_PW329_240311, 0089_PW357_240311,	**11-Mar-2024**	**14-Mar-2024**	07-Sep-2024	✓	**14-Mar-2024**	07-Sep-2024	✓
EP231C: Perfluoroalkyl Sulfonamides							
HDPE (no PTFE) (EP231X)							
0089_QC107_240311, 0089_SW156_240311, 0089_SW152_240311 - Lab QC added, 0089_PW356_240311, 0089_SW150_240311, 0089_SW154_240311, 0089_PW330_240311, 0089_PW331_240311 - Lab QC added, 0089_PW358_240311, 0089_PW329_240311, 0089_PW357_240311,	**11-Mar-2024**	**14-Mar-2024**	07-Sep-2024	✓	**14-Mar-2024**	07-Sep-2024	✓
EP231D: (n:2) Fluorotelomer Sulfonic Acids							
HDPE (no PTFE) (EP231X)							
0089_QC107_240311, 0089_SW156_240311, 0089_SW152_240311 - Lab QC added, 0089_PW356_240311, 0089_SW150_240311, 0089_SW154_240311, 0089_PW330_240311, 0089_PW331_240311 - Lab QC added, 0089_PW358_240311, 0089_PW329_240311, 0089_PW357_240311,	**11-Mar-2024**	**14-Mar-2024**	07-Sep-2024	✓	**14-Mar-2024**	07-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)							
0089_QC107_240311, 0089_PW330_240311, 0089_SW156_240311, 0089_PW331_240311 - Lab QC added, 0089_SW152_240311 - Lab QC added, 0089_PW358_240311, 0089_PW356_240311, 0089_PW329_240311, 0089_SW150_240311, 0089_PW357_240311, 0089_SW154_240311	**11-Mar-2024**	**14-Mar-2024**	07-Sep-2024	✓	**14-Mar-2024**	07-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)							
Alkalinity by Auto Titrator	ED037-P	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	2	19	**10.53**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	19	**10.53**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Alkalinity by Auto Titrator	ED037-P	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	1	19	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	19	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Alkalinity by Auto Titrator	ED037-P	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	1	19	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	19	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Chloride by Discrete Analyser	ED045G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	19	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	20	**5.00**	**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
Alkalinity by Auto Titrator	ED037-P	WATER	In house: Referenced to APHA 2320 B This procedure determines alkalinity by automated measurement (e.g. PC Titrate) on a settled supernatant aliquot of the sample using pH 4.5 for indicating the total alkalinity end-point. This method is compliant with NEPM Schedule B(3)
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	WATER	In house: Referenced to APHA 4500-SO4. Dissolved sulfate is determined in a 0.45um filtered sample. Sulfate ions are converted to a barium sulfate suspension in an acetic acid medium with barium chloride. Light absorbance of the BaSO4 suspension is measured by a photometer and the SO4-2 concentration is determined by comparison of the reading with a standard curve. This method is compliant with NEPM Schedule B(3)
Chloride by Discrete Analyser	ED045G	WATER	In house: Referenced to APHA 4500 Cl - G.The thiocyanate ion is liberated from mercuric thiocyanate through sequestration of mercury by the chloride ion to form non-ionised mercuric chloride. In the presence of ferric ions the liberated thiocynate forms highly-coloured ferric thiocynate which is measured at 480 nm.
Major Cations - Dissolved	ED093F	WATER	In house: Referenced to APHA 3120 and 3125; USEPA SW 846 - 6010 and 6020; Cations are determined by either ICP-AES or ICP-MS techniques. This method is compliant with NEPM Schedule B(3) Sodium Adsorption Ratio is calculated from Ca, Mg and Na which determined by ALS in house method QWI-EN/ED093F. This method is compliant with NEPM Schedule B(3) Hardness parameters are calculated based on APHA 2340 B. This method is compliant with NEPM Schedule B(3)
Ionic Balance by PCT DA and Turbi SO4 DA	* EN055 - PG	WATER	In house: Referenced to APHA 1030F. This method is compliant with NEPM Schedule B(3)
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.

CHAIN OF CUSTODY

ALS COC#: 64907 ALS Laboratory: EP Perth Environmental

RELINQUISHED BY:	[redacted] BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME: 12/3 1145	DATE TIME:	DATE TIME:

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP_24

SITE: Stirling GW - CG

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted]

QUOTE NO: SY/139/19 B

SAMPLER MOBILE: [redacted] / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES 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	WA OMP Water Suite WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
001	0089_MW215		11/03/2024 12:46 PM	WATER	ALS: 3 Non ALS: 0	No	X		
002	0089_MW214		11/03/2024 01:02 PM	WATER	ALS: 5 Non ALS: 0	No	X		

Environmental Division Perth

Work Order Reference

EP2403152

Telephone : +61-8-9406 1301

CHAIN OF CUSTODY

COC#: **64907** *ALS Laboratory:* EP Perth Environmental

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

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP_24

SITE: Stirling GW - CG

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO:

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	0089_MW215	Clear Plastic Bottle - Natural	125 mL	00070821217625	Green	No	
001	0089_MW215	HDPE (no PTFE)	20 mL	00352309065818	Grey	No	
001	0089_MW215	HDPE (no PTFE)	20 mL	00352309065947	Grey	No	
002	0089_MW214	HDPE (no PTFE)	20 mL	00352312004144	Grey	No	
002	0089_MW214	HDPE (no PTFE)	20 mL	00352312004164	Grey	No	
002	0089_MW214	Clear Plastic Bottle - Natural	125 mL	00070821217541	Green	No	
002	0089_MW214	HDPE (no PTFE)	20 mL	00352309065946	Grey	No	
002	0089_MW214	HDPE (no PTFE)	20 mL	00352309065953	Grey	No	

Total Bottle Count: ALS: 8, Non ALS: 0

SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : **EP2403152**

Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: Customer Services EP
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
E-mail	: [redacted]stantec.com	E-mail	: ALSEnviro.Perth@alsglobal.com
Telephone	: ----	Telephone	: +61-8-9406 1301
Facsimile	: ----	Facsimile	: +61-8-9406 1399
Project	: WA_0089_PFASOMP_24	Page	: 1 of 2
Order number	: pfas-omp/Stirling	Quote number	: ES2022MWHAUS0002 (SY/139/19 B)
C-O-C number	: 64907	QC Level	: NEPM 2013 B3 & ALS QC Standard
Site	: Stirling GW - CG		
Sampler	: [redacted]		

Dates

Date Samples Received	: 12-Mar-2024 11:45	Issue Date	: 15-Mar-2024
Client Requested Due Date	: 20-Mar-2024	Scheduled Reporting Date	: **19-Mar-2024**

Delivery Details

Mode of Delivery	: Carrier	Security Seal	: Not Available
No. of coolers/boxes	: 3	Temperature	: 9.5 - Ice present
Receipt Detail	:	No. of samples received / analysed	: 2 / 2

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 see scanned COC for sample discrepencies: extra samples , samples not received etc.
- Please direct any queries related to sample condition / numbering / breakages to Sample Receipt (Samples.Perth@alsglobal.com)
- Analytical work for this work order will be conducted at ALS Environmental Perth.
- Please direct any turnaround / technical queries to the laboratory contact designated above.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months) from receipt of samples.
- **pH analysis should be conducted within 6 hours of sampling.**
- **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.**
- 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)	WATER - NT-01 & 02 Ca, Mg, Na, K, Cl, SO4, Alkalinity
EP2403152-001	11-Mar-2024 12:46	0089_MW215_240311	✓	✓
EP2403152-002	11-Mar-2024 13:02	0089_MW214_240311	✓	✓

Proactive Holding Time Report

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

Requested Deliverables

[redacted]
- A4 - AU Tax Invoice (INV) — Email — [redacted]cardno.com.au

DERP LAB REPORTS
- EDI Format - ESDAT (ESDAT) — Email — derp.labreports@esdat.com.au

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

CERTIFICATE OF ANALYSIS

Work Order	: **EP2403152**	Page	: 1 of 6
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: Customer Services EP
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: +61-8-9406 1301
Project	: WA_0089_PFASOMP_24	Date Samples Received	: 12-Mar-2024 11:45
Order number	: pfas-omp/Stirling	Date Analysis Commenced	: 13-Mar-2024
C-O-C number	: 64907	Issue Date	: 20-Mar-2024 22:35
Sampler	: [redacted] [redacted]		
Site	: Stirling GW - CG		
Quote number	: SY/139/19 B		
No. of samples received	: 2		
No. of samples analysed	: 2		

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]	Inorganics Supervisor	Perth Inorganics, Wangara, WA
[redacted]	Inorganics Analyst	Perth Inorganics, Wangara, WA
[redacted]	Senior Organic Chemist	Perth Organics, Wangara, WA

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.
- As per QWI – EN55-3 Data Interpreting Procedures, Ionic balances are typically calculated using Major Anions - Chloride, Alkalinity and Sulfate; and Major Cations - Calcium, Magnesium, Potassium and Sodium. Where applicable and dependent upon sample matrix, the Ionic Balance may also include the additional contribution of Ammonia, Dissolved Metals by ICPMS and H+ to the Cations and Nitrate, SiO2 and Fluoride to the Anions.
- Sodium Adsorption Ratio (where reported): Where results for Na, Ca or Mg are <LOR, a concentration at half the reported LOR is incorporated into the SAR calculation. This represents a conservative approach for Na relative to the assumption that <LOR = zero concentration and a conservative approach for Ca & Mg relative to the assumption that <LOR is equivalent to the LOR concentration.
- 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.
- ED045G: The presence of Thiocyanate, Thiosulfate and Sulfite can positively contribute to the chloride result, thereby may bias results higher than expected. Results should be scrutinised accordingly.

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW215_240311	0089_MW214_240311	----	----	----
				Sampling date / time	11-Mar-2024 12:46	11-Mar-2024 13:02	----	----	----
Compound	CAS Number	LOR	Unit		EP2403152-001	EP2403152-002	--------	--------	--------
					Result	Result	----	----	----
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	<1	----	----	----
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	<1	----	----	----
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		**285**	**379**	----	----	----
Total Alkalinity as CaCO3	----	1	mg/L		**285**	**379**	----	----	----
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		**94**	**111**	----	----	----
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		**354**	**1940**	----	----	----
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		**132**	**260**	----	----	----
Magnesium	7439-95-4	1	mg/L		**31**	**122**	----	----	----
Sodium	7440-23-5	1	mg/L		**132**	**848**	----	----	----
Potassium	7440-09-7	1	mg/L		**9**	**11**	----	----	----
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		**17.6**	**64.6**	----	----	----
ø Total Cations	----	0.01	meq/L		**15.1**	**60.2**	----	----	----
ø Ionic Balance	----	0.01	%		**7.72**	**3.55**	----	----	----
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		**0.04**	<0.02	----	----	----
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		**0.07**	<0.02	----	----	----
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		**0.49**	<0.01	----	----	----
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		**0.01**	<0.01	----	----	----
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	<0.02	----	----	----

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW215_240311	0089_MW214_240311	----	----	----
				Sampling date / time	11-Mar-2024 12:46	11-Mar-2024 13:02	----	----	----
Compound	CAS Number	LOR	Unit		EP2403152-001	EP2403152-002	--------	--------	--------
					Result	Result	----	----	----
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		<0.1	<0.1	----	----	----
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		**0.04**	<0.02	----	----	----
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		**0.14**	<0.02	----	----	----
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		**0.03**	<0.02	----	----	----
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		<0.01	<0.01	----	----	----
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		<0.05	<0.05	----	----	----
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L		<0.02	<0.02	----	----	----
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L		<0.05	<0.05	----	----	----
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L		<0.05	<0.05	----	----	----
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L		<0.05	<0.05	----	----	----
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L		<0.05	<0.05	----	----	----
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L		<0.02	<0.02	----	----	----
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L		<0.02	<0.02	----	----	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids									

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW215_240311	0089_MW214_240311	----	----	----
				Sampling date / time	11-Mar-2024 12:46	11-Mar-2024 13:02	----	----	----
Compound	CAS Number	LOR	Unit		EP2403152-001	EP2403152-002	--------	--------	--------
					Result	Result	----	----	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L		<0.05	<0.05	----	----	----
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		<0.05	<0.05	----	----	----
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		<0.05	<0.05	----	----	----
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L		<0.05	<0.05	----	----	----
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L		**0.82**	<0.01	----	----	----
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		**0.50**	<0.01	----	----	----
Sum of PFAS (WA DER List)	----	0.01	µg/L		**0.75**	<0.01	----	----	----
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**110**	**112**	----	----	----
13C8-PFOA	----	0.02	%		**80.2**	**81.0**	----	----	----

Surrogate Control Limits

Sub-Matrix: **GROUNDWATER**		Recovery Limits (%)	
Compound	*CAS Number*	*Low*	*High*
EP231S: PFAS Surrogate			
13C4-PFOS	----	65	140
13C8-PFOA	----	71	133

QUALITY CONTROL REPORT

Work Order	: **EP2403152**	Page	: 1 of 9
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: Customer Services EP
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: +61-8-9406 1301
Project	: WA_0089_PFASOMP_24	Date Samples Received	: 12-Mar-2024
Order number	: pfas-omp/Stirling	Date Analysis Commenced	: 13-Mar-2024
C-O-C number	: 64907	Issue Date	: 20-Mar-2024
Sampler	: [redacted]		
Site	: Stirling GW - CG		
Quote number	: SY/139/19 B		
No. of samples received	: 2		
No. of samples analysed	: 2		

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]	Inorganics Supervisor	Perth Inorganics, Wangara, WA
[redacted]	Inorganics Analyst	Perth Inorganics, Wangara, WA
[redacted]	Senior Organic Chemist	Perth Organics, Wangara, WA

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 (%)*
ED037P: Alkalinity by PC Titrator (QC Lot: 5662718)									
EP2403138-002	Anonymous	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	431	429	0.4	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	431	429	0.4	0% - 20%
EP2403138-012	Anonymous	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	425	426	0.0	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	425	426	0.0	0% - 20%
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QC Lot: 5660256)									
EP2403152-001	0089_MW215_240311	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	94	90	4.1	0% - 20%
EP2403168-010	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<1	<1	0.0	No Limit
ED045G: Chloride by Discrete Analyser (QC Lot: 5660257)									
EP2403152-001	0089_MW215_240311	ED045G: Chloride	16887-00-6	1	mg/L	354	339	4.1	0% - 20%
EP2403168-010	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	<1	<1	0.0	No Limit
ED093F: Dissolved Major Cations (QC Lot: 5660387)									
EP2403147-021	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	480	487	1.4	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	1520	1540	0.9	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	11700	11800	0.8	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	629	635	1.0	0% - 20%
EP2403151-005	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	510	529	3.6	0% - 20%

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 (%)
ED093F: Dissolved Major Cations (QC Lot: 5660387) - continued									
EP2403151-005	Anonymous	ED093F: Magnesium	7439-95-4	1	mg/L	1620	1670	3.2	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	12500	13000	3.5	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	678	706	4.0	0% - 20%
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 5660705)									
EP2403147-024	Anonymous	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
EP2403149-003	Anonymous	EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01 (0.07)*	µg/L	16.2	17.0	4.9	0% - 20%
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01 (0.07)*	µg/L	48.0	45.4	5.6	0% - 20%
		EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	0.49	0.50	3.6	0% - 20%
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	0.94	0.90	3.5	0% - 20%
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	0.55	0.52	5.4	0% - 20%
		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: 5660705)									
EP2403147-024	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
EP2403149-003	Anonymous	EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	1.07	1.15	7.6	0% - 20%
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	1.26	1.36	7.6	0% - 20%
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02 (0.07)*	µg/L	13.4	13.6	2.0	0% - 20%
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	0.35	0.35	0.0	0% - 50%
		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

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: 5660705) - continued									
EP2403149-003	Anonymous	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	0.3	0.3	0.0	No Limit
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 5660705)									
EP2403147-024	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
EP2403149-003	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: 5660705)									
EP2403147-024	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
EP2403149-003	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

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: 5660705) - continued									
EP2403149-003	Anonymous	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: 5660705)									
EP2403147-024	Anonymous	EP231X: Sum of PFAS	----	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	<0.01	<0.01	0.0	No Limit
EP2403149-003	Anonymous	EP231X: Sum of PFAS	----	0.01 (0.07)*	µg/L	82.6	81.1	1.8	0% - 20%
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01 (0.07)*	µg/L	64.2	62.4	2.8	0% - 20%
		EP231X: Sum of PFAS (WA DER List)	----	0.01 (0.07)*	µg/L	81.1	79.7	1.8	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
ED037P: Alkalinity by PC Titrator (QCLot: 5662718)								
ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	----	----	----	----
ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	----	----	----	----
ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	<1	----	----	----	----
ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	<1	20 mg/L	95.9	85.1	126
				<1	200 mg/L	101	90.5	111
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 5660256)								
ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<1	25 mg/L	99.7	89.9	112
				<1	500 mg/L	103	89.9	112
ED045G: Chloride by Discrete Analyser (QCLot: 5660257)								
ED045G: Chloride	16887-00-6	1	mg/L	<1	10 mg/L	104	88.6	113
				<1	1000 mg/L	112	88.6	113
ED093F: Dissolved Major Cations (QCLot: 5660387)								
ED093F: Calcium	7440-70-2	1	mg/L	<1	50 mg/L	105	86.5	117
ED093F: Magnesium	7439-95-4	1	mg/L	<1	50 mg/L	97.8	88.4	110
ED093F: Sodium	7440-23-5	1	mg/L	<1	50 mg/L	98.3	91.4	113
ED093F: Potassium	7440-09-7	1	mg/L	<1	50 mg/L	95.6	84.6	108
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5660705)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.2218 µg/L	89.3	72.0	130
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.2352 µg/L	77.0	71.0	127
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	0.2373 µg/L	81.5	68.0	131
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.238 µg/L	81.3	69.0	134
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.232 µg/L	86.0	65.0	140
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.241 µg/L	86.7	53.0	142
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5660705)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	1.25 µg/L	91.6	73.0	129
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	0.25 µg/L	92.0	72.0	129
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	0.25 µg/L	101	72.0	129
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	0.25 µg/L	88.0	72.0	130
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	0.25 µg/L	89.6	71.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	0.25 µg/L	95.2	69.0	130

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
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5660705) - continued								
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	0.25 µg/L	94.0	71.0	129
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	0.25 µg/L	97.2	69.0	133
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	0.25 µg/L	88.0	72.0	134
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	0.25 µg/L	90.0	65.0	144
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	0.25 µg/L	91.8	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5660705)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.25 µg/L	84.8	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	0.625 µg/L	104	68.0	141
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	0.625 µg/L	97.4	60.5	138
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	0.625 µg/L	92.1	68.3	134
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	0.625 µg/L	81.0	62.2	138
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	0.25 µg/L	111	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
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5660705)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.2343 µg/L	92.8	63.0	143
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	0.2378 µg/L	96.7	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	0.24 µg/L	100	67.0	138
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	0.241 µg/L	78.8	64.2	133
EP231P: PFAS Sums (QCLot: 5660705)								
EP231X: Sum of PFAS	----	0.01	µg/L	<0.01	----	----	----	----
EP231X: Sum of PFHxS and PFOS	355-46-4/17 63-23-1	0.01	µg/L	<0.01	----	----	----	----
EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	<0.01	----	----	----	----

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
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 5660256)							
EP2403152-001	0089_MW215_240311	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	100 mg/L	99.7	70.4	130

Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*Concentration*	*MS*	*Low*	*High*
ED045G: Chloride by Discrete Analyser (QCLot: 5660257)							
EP2403152-001	0089_MW215_240311	ED045G: Chloride	16887-00-6	200 mg/L	102	70.0	130
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5660705)							
EP2403147-026	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.2218 µg/L	94.2	72.0	129
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.232 µg/L	79.7	71.0	127
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.2352 µg/L	85.9	68.0	129
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.238 µg/L	79.8	69.0	134
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.232 µg/L	87.5	65.0	140
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.241 µg/L	89.2	53.0	129
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5660705)							
EP2403147-026	Anonymous	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	1.25 µg/L	94.1	73.0	142
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.25 µg/L	89.5	72.0	129
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.25 µg/L	103	72.0	129
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.25 µg/L	87.2	72.0	130
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.25 µg/L	97.8	71.0	133
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.25 µg/L	97.2	69.0	130
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.25 µg/L	89.2	71.0	134
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.25 µg/L	94.8	69.0	133
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.25 µg/L	93.0	72.0	134
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.25 µg/L	84.4	65.0	144
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.25 µg/L	95.0	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5660705)							
EP2403147-026	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.25 µg/L	85.8	59.0	135
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.625 µg/L	110	70.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.625 µg/L	91.4	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.625 µg/L	92.1	70.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.625 µg/L	87.9	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.25 µg/L	91.8	65.0	136
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.25 µg/L	85.8	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5660705)							
EP2403147-026	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.234 µg/L	96.2	63.0	143
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.2378 µg/L	99.3	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.24 µg/L	102	67.0	138
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.2415 µg/L	79.1	70.0	130

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **EP2403152**	Page	: 1 of 4
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Telephone	: +61-8-9406 1301
Project	: WA_0089_PFASOMP_24	Date Samples Received	: 12-Mar-2024
Site	: Stirling GW - CG	Issue Date	: 20-Mar-2024
Sampler	: [redacted]	No. of samples received	: 2
Order number	: pfas-omp/Stirling	No. of samples analysed	: 2

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
ED037P: Alkalinity by PC Titrator								
Clear Plastic Bottle - Natural (ED037-P)								
0089_MW215_240311,	0089_MW214_240311	**11-Mar-2024**	**----**	----	----	**15-Mar-2024**	25-Mar-2024	✓
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA								
Clear Plastic Bottle - Natural (ED041G)								
0089_MW215_240311,	0089_MW214_240311	**11-Mar-2024**	**----**	----	----	**20-Mar-2024**	08-Apr-2024	✓
ED045G: Chloride by Discrete Analyser								
Clear Plastic Bottle - Natural (ED045G)								
0089_MW215_240311,	0089_MW214_240311	**11-Mar-2024**	**----**	----	----	**20-Mar-2024**	08-Apr-2024	✓
ED093F: Dissolved Major Cations								
Clear Plastic Bottle - Natural (ED093F)								
0089_MW215_240311,	0089_MW214_240311	**11-Mar-2024**	**----**	----	----	**15-Mar-2024**	18-Mar-2024	✓
EP231A: Perfluoroalkyl Sulfonic Acids								
HDPE (no PTFE) (EP231X)								
0089_MW215_240311,	0089_MW214_240311	**11-Mar-2024**	**14-Mar-2024**	07-Sep-2024	✓	**14-Mar-2024**	07-Sep-2024	✓
EP231B: Perfluoroalkyl Carboxylic Acids								
HDPE (no PTFE) (EP231X)								
0089_MW215_240311,	0089_MW214_240311	**11-Mar-2024**	**14-Mar-2024**	07-Sep-2024	✓	**14-Mar-2024**	07-Sep-2024	✓
EP231C: Perfluoroalkyl Sulfonamides								
HDPE (no PTFE) (EP231X)								
0089_MW215_240311,	0089_MW214_240311	**11-Mar-2024**	**14-Mar-2024**	07-Sep-2024	✓	**14-Mar-2024**	07-Sep-2024	✓
EP231D: (n:2) Fluorotelomer Sulfonic Acids								
HDPE (no PTFE) (EP231X)								
0089_MW215_240311,	0089_MW214_240311	**11-Mar-2024**	**14-Mar-2024**	07-Sep-2024	✓	**14-Mar-2024**	07-Sep-2024	✓
EP231P: PFAS Sums								
HDPE (no PTFE) (EP231X)								
0089_MW215_240311,	0089_MW214_240311	**11-Mar-2024**	**14-Mar-2024**	07-Sep-2024	✓	**14-Mar-2024**	07-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)							
Alkalinity by Auto Titrator	ED037-P	2	16	**12.50**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	2	19	**10.53**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Alkalinity by Auto Titrator	ED037-P	2	16	**12.50**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	1	19	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Alkalinity by Auto Titrator	ED037-P	1	16	**6.25**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	1	19	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Chloride by Discrete Analyser	ED045G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	20	**5.00**	**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
Alkalinity by Auto Titrator	ED037-P	WATER	In house: Referenced to APHA 2320 B This procedure determines alkalinity by automated measurement (e.g. PC Titrate) on a settled supernatant aliquot of the sample using pH 4.5 for indicating the total alkalinity end-point. This method is compliant with NEPM Schedule B(3)
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	WATER	In house: Referenced to APHA 4500-SO4. Dissolved sulfate is determined in a 0.45um filtered sample. Sulfate ions are converted to a barium sulfate suspension in an acetic acid medium with barium chloride. Light absorbance of the BaSO4 suspension is measured by a photometer and the SO4-2 concentration is determined by comparison of the reading with a standard curve. This method is compliant with NEPM Schedule B(3)
Chloride by Discrete Analyser	ED045G	WATER	In house: Referenced to APHA 4500 Cl - G.The thiocyanate ion is liberated from mercuric thiocyanate through sequestration of mercury by the chloride ion to form non-ionised mercuric chloride. In the presence of ferric ions the liberated thiocynate forms highly-coloured ferric thiocynate which is measured at 480 nm.
Major Cations - Dissolved	ED093F	WATER	In house: Referenced to APHA 3120 and 3125; USEPA SW 846 - 6010 and 6020; Cations are determined by either ICP-AES or ICP-MS techniques. This method is compliant with NEPM Schedule B(3) Sodium Adsorption Ratio is calculated from Ca, Mg and Na which determined by ALS in house method QWI-EN/ED093F. This method is compliant with NEPM Schedule B(3) Hardness parameters are calculated based on APHA 2340 B. This method is compliant with NEPM Schedule B(3)
Ionic Balance by PCT DA and Turbi SO4 DA	* EN055 - PG	WATER	In house: Referenced to APHA 1030F. This method is compliant with NEPM Schedule B(3)
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.

ALSCompass
SAMPLING *Intelligence*

ALS

Environmental Division
Perth
Work Order Reference
EP2403216

Telephone : 61-8-9406 1301

Custody Document for Submissions via ALS Compass App

Project: WA_0089_PFASOMP_24 **Client:** Stantec **Project Manager:** [redacted]

Phone:

ALS Compass COC Reference: 64954; 64944; 64940; 64939; 64941; 64947; 64949 **# Samples:** **Sampler:** [redacted]

Phone:

Turnaround Requirements: Standard Urgent

Special Instructions:

Custody:

Relinquished by: [redacted]	Received by: [redacted]	Relinquished by:	Received by:
Date / Time: 12/3/24 - 3:09pm	Date / Time: 13/3 1215	Date / Time:	Date / Time:

CHAIN OF CUSTODY

ALS COC#: 64944 ALS Laboratory: EP Perth Environmental

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME: 13/3 1215	DATE TIME:	DATE TIME:

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP_24

SITE: Stirling GW - CG

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted]

QUOTE NO: SY/139/19 B

SAMPLER MOBILE [redacted] / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES 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	Rinsate WATER	WA OMP Water Suite WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
001	0089_MW202		12/03/2024 09:04 AM	WATER	ALS: 3 Non ALS: 0	No		X		
002	0089_MW193		12/03/2024 11:40 AM	WATER	ALS: 5 Non ALS: 0	No		X		
003	0089_MW195S		12/03/2024 01:25 PM	WATER	ALS: 3 Non ALS: 0	No		X		
004	0089_MW195D		12/03/2024 01:38 PM	WATER	ALS: 3 Non ALS: 0	No		X		
005	0089_MW128		12/03/2024 01:59 PM	WATER	ALS: 3 Non ALS: 0	No		X		
006	0089_MW199		12/03/2024 02:24 PM	WATER	ALS: 3 Non ALS: 0	No		X		
007	0089_QC301		12/03/2024 03:04 PM	WATER	ALS: 2 Non ALS: 0	No	X			

CHAIN OF CUSTODY

(ALS) COC#: 64944 ALS Laboratory: EP Perth Environmental

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

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP_24

SITE: Stirling GW - CG

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted]

QUOTE NO: SY/139/19 B

SAMPLER MOBILE: [redacted] / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES 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	Rinsate WATER	WA OMP Water Suite WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
008	0089_QC401		12/03/2024 03:06 PM	WATER	ALS: 2 Non ALS: 0	No	X			
009	0089_QC402		12/03/2024 03:07 PM	WATER	ALS: 2 Non ALS: 0	No	X			
010	0089_QC302		12/03/2024 03:08 PM	WATER	ALS: 2 Non ALS: 0	No	X			
011	0089_QC303		12/03/2024 03:11 PM	WATER	ALS: 2 Non ALS: 0	No	X			
012	0089_QC403		12/03/2024 03:12 PM	WATER	ALS: 2 Non ALS: 0	No	X			

CHAIN OF CUSTODY

COC#: 64944 ALS Laboratory: EP Perth Environmental

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

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP_24

SITE: Stirling GW - CG

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES 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	0089_MW202	Clear Plastic Bottle - Natural	125 mL	00070821217425	Green	No	
001	0089_MW202	HDPE (no PTFE)	20 mL	00352309065931	Grey	No	
001	0089_MW202	HDPE (no PTFE)	20 mL	00352309065870	Grey	No	
002	0089_MW193	Clear Plastic Bottle - Natural	125 mL	00070821217565	Green	No	
002	0089_MW193	HDPE (no PTFE)	20 mL	00352309050540	Grey	No	
002	0089_MW193	HDPE (no PTFE)	20 mL	00352309050595	Grey	No	
002	0089_MW193	HDPE (no PTFE)	20 mL	00352312003996	Grey	No	
002	0089_MW193	HDPE (no PTFE)	20 mL	00352312004270	Grey	No	
003	0089_MW195S	HDPE (no PTFE)	20 mL	00352309050565	Grey	No	
003	0089_MW195S	HDPE (no PTFE)	20 mL	00352309050660	Grey	No	
003	0089_MW195S	Clear Plastic Bottle - Natural	125 mL	00070821217356	Green	No	
004	0089_MW195D	Clear Plastic Bottle - Natural	125 mL	00070821217463	Green	No	
004	0089_MW195D	HDPE (no PTFE)	20 mL	00352309065743	Grey	No	
004	0089_MW195D	HDPE (no PTFE)	20 mL	00352309065993	Grey	No	
005	0089_MW128	Clear Plastic Bottle - Natural	125 mL	00070821217472	Green	No	
005	0089_MW128	HDPE (no PTFE)	20 mL	00352309065894	Grey	No	
005	0089_MW128	HDPE (no PTFE)	20 mL	00352309065853	Grey	No	
006	0089_MW199	Clear Plastic Bottle - Natural	125 mL	00070821217475	Green	No	
006	0089_MW199	HDPE (no PTFE)	20 mL	00352309065918	Grey	No	
006	0089_MW199	HDPE (no PTFE)	20 mL	00352309065961	Grey	No	
007	0089_QC301	HDPE (no PTFE)	20 mL	00352312004303	Grey	No	
007	0089_QC301	HDPE (no PTFE)	20 mL	00352309065842	Grey	No	
008	0089_QC401	HDPE (no PTFE)	20 mL	00352309065840	Grey	No	
008	0089_QC401	HDPE (no PTFE)	20 mL	00352309065994	Grey	No	
009	0089_QC402	HDPE (no PTFE)	20 mL	00352309065825	Grey	No	
009	0089_QC402	HDPE (no PTFE)	20 mL	00352312004443	Grey	No	

CHAIN OF CUSTODY

ALS COC#: 64944 ALS Laboratory: EP Perth Environmental

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

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP_24

SITE: Stirling GW - CG

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES 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:

010	0089_QC302	HDPE (no PTFE)	20 mL	00352312003860	Grey	No	
010	0089_QC302	HDPE (no PTFE)	20 mL	00352312004153	Grey	No	
011	0089_QC303	HDPE (no PTFE)	20 mL	00352312004298	Grey	No	
011	0089_QC303	HDPE (no PTFE)	20 mL	00352312003740	Grey	No	
012	0089_QC403	HDPE (no PTFE)	20 mL	00352309050659	Grey	No	
012	0089_QC403	HDPE (no PTFE)	20 mL	00352312003753	Grey	No	

Total Bottle Count: ALS: 32, Non ALS: 0

SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : **EP2403216**

Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: Customer Services EP
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
E-mail	: [redacted]stantec.com	E-mail	: ALSEnviro.Perth@alsglobal.com
Telephone	: ----	Telephone	: +61-8-9406 1301
Facsimile	: ----	Facsimile	: +61-8-9406 1399
Project	: WA_0089_PFASOMP_24	Page	: 1 of 2
Order number	: pfas-omp/Stirling	Quote number	: ES2022MWHAUS0002 (SY/139/19 B)
C-O-C number	: 64944	QC Level	: NEPM 2013 B3 & ALS QC Standard
Site	: Stirling GW - CG		
Sampler	: [redacted]		

Dates

Date Samples Received	: 13-Mar-2024 12:15	Issue Date	: 15-Mar-2024
Client Requested Due Date	: 22-Mar-2024	Scheduled Reporting Date	: **22-Mar-2024**

Delivery Details

Mode of Delivery	: Carrier	Security Seal	: Not Available
No. of coolers/boxes	: 2	Temperature	: 14.9 - Ice present
Receipt Detail	:	No. of samples received / analysed	: 12 / 12

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 see scanned COC for sample discrepencies: extra samples , samples not received etc.
- Please direct any queries related to sample condition / numbering / breakages to Sample Receipt (Samples.Perth@alsglobal.com)
- Analytical work for this work order will be conducted at ALS Environmental Perth.
- Please direct any turnaround / technical queries to the laboratory contact designated above.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months) from receipt of samples.
- **pH analysis should be conducted within 6 hours of sampling.**
- **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.**
- 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)	WATER - NT-01 & 02 Ca, Mg, Na, K, Cl, SO4, Alkalinity
EP2403216-001	12-Mar-2024 09:04	0089_MW202_240312	✓	✓
EP2403216-002	12-Mar-2024 11:40	0089_MW193_240312	✓	✓
EP2403216-003	12-Mar-2024 13:25	0089_MW195S_240312	✓	✓
EP2403216-004	12-Mar-2024 13:38	0089_MW195D_240312	✓	✓
EP2403216-005	12-Mar-2024 13:59	0089_MW128_240312	✓	✓
EP2403216-006	12-Mar-2024 14:24	0089_MW199_240312	✓	✓
EP2403216-007	12-Mar-2024 15:04	0089_QC301_240312	✓	
EP2403216-008	12-Mar-2024 15:06	0089_QC401_240312	✓	
EP2403216-009	12-Mar-2024 15:07	0089_QC402_240312	✓	
EP2403216-010	12-Mar-2024 15:08	0089_QC302_240312	✓	
EP2403216-011	12-Mar-2024 15:11	0089_QC303_240312	✓	
EP2403216-012	12-Mar-2024 15:12	0089_QC403_240312	✓	

Proactive Holding Time Report

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

Requested Deliverables

[redacted]
- A4 - AU Tax Invoice (INV) — Email — [redacted]cardno.com.au

DERP LAB REPORTS
- EDI Format - ESDAT (ESDAT) — Email — derp.labreports@esdat.com.au

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

CERTIFICATE OF ANALYSIS

Work Order	: **EP2403216**	Page	: 1 of 11
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: Customer Services EP
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: +61-8-9406 1301
Project	: WA_0089_PFASOMP_24	Date Samples Received	: 13-Mar-2024 12:15
Order number	: pfas-omp/Stirling	Date Analysis Commenced	: 15-Mar-2024
C-O-C number	: 64944	Issue Date	: 25-Mar-2024 18:57
Sampler	: [redacted] [redacted]		
Site	: Stirling GW - CG		
Quote number	: SY/139/19 B		
No. of samples received	: 12		
No. of samples analysed	: 12		

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]	Inorganics Supervisor	Perth Inorganics, Wangara, WA
[redacted]	Senior Organic Chemist	Perth Organics, Wangara, WA

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.
- As per QWI – EN55-3 Data Interpreting Procedures, Ionic balances are typically calculated using Major Anions - Chloride, Alkalinity and Sulfate; and Major Cations - Calcium, Magnesium, Potassium and Sodium. Where applicable and dependent upon sample matrix, the Ionic Balance may also include the additional contribution of Ammonia, Dissolved Metals by ICPMS and H+ to the Cations and Nitrate, SiO2 and Fluoride to the Anions.
- Sodium Adsorption Ratio (where reported): Where results for Na, Ca or Mg are <LOR, a concentration at half the reported LOR is incorporated into the SAR calculation. This represents a conservative approach for Na relative to the assumption that <LOR = zero concentration and a conservative approach for Ca & Mg relative to the assumption that <LOR is equivalent to the LOR concentration.
- 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.
- ED045G: The presence of Thiocyanate, Thiosulfate and Sulfite can positively contribute to the chloride result, thereby may bias results higher than expected. Results should be scrutinised accordingly.

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)			Sample ID	0089_MW202_240312	0089_MW193_240312	0089_MW195S_240312	0089_MW195D_240312	0089_MW128_240312
			Sampling date / time	12-Mar-2024 09:04	12-Mar-2024 11:40	12-Mar-2024 13:25	12-Mar-2024 13:38	12-Mar-2024 13:59
Compound	CAS Number	LOR	Unit	EP2403216-001	EP2403216-002	EP2403216-003	EP2403216-004	EP2403216-005
				Result	Result	Result	Result	Result
ED037P: Alkalinity by PC Titrator								
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	<1	<1	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	<1	<1	<1
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	**355**	**1030**	**556**	**188**	**374**
Total Alkalinity as CaCO3	----	1	mg/L	**355**	**1030**	**556**	**188**	**374**
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA								
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	**41**	**191**	**237**	**1370**	**21**
ED045G: Chloride by Discrete Analyser								
Chloride	16887-00-6	1	mg/L	**195**	**795**	**784**	**10400**	**105**
ED093F: Dissolved Major Cations								
Calcium	7440-70-2	1	mg/L	**105**	**149**	**171**	**368**	**122**
Magnesium	7439-95-4	1	mg/L	**25**	**137**	**114**	**776**	**28**
Sodium	7440-23-5	1	mg/L	**128**	**461**	**385**	**5400**	**60**
Potassium	7440-09-7	1	mg/L	**6**	**38**	**36**	**298**	**3**
EN055: Ionic Balance								
ø Total Anions	----	0.01	meq/L	**13.4**	**47.0**	**38.2**	**326**	**10.9**
ø Total Cations	----	0.01	meq/L	**13.0**	**39.7**	**35.6**	**325**	**11.1**
ø Ionic Balance	----	0.01	%	**1.62**	**8.36**	**3.49**	**0.14**	**0.94**
EP231A: Perfluoroalkyl Sulfonic Acids								
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	**0.78**	<0.02	<0.02	<0.02
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	**1.45**	<0.02	<0.02	<0.02
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	**0.01**	**11.5**	<0.01	**0.02**	**0.06**
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	**0.84**	<0.02	<0.02	<0.02
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	**0.04**	**3.50**	<0.01	<0.01	**1.08**
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW202_240312	0089_MW193_240312	0089_MW195S_240312	0089_MW195D_240312	0089_MW128_240312
				Sampling date / time	12-Mar-2024 09:04	12-Mar-2024 11:40	12-Mar-2024 13:25	12-Mar-2024 13:38	12-Mar-2024 13:59
Compound	CAS Number	LOR	Unit		EP2403216-001	EP2403216-002	EP2403216-003	EP2403216-004	EP2403216-005
					Result	Result	Result	Result	Result
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		<0.1	**0.3**	<0.1	<0.1	<0.1
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		<0.02	**0.34**	<0.02	<0.02	<0.02
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		<0.02	**1.62**	<0.02	<0.02	**0.02**
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		<0.02	**0.26**	<0.02	<0.02	<0.02
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		<0.01	**0.85**	<0.01	**0.01**	**0.01**
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		<0.02	**0.04**	<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
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									

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW202_240312	0089_MW193_240312	0089_MW195S_240312	0089_MW195D_240312	0089_MW128_240312
				Sampling date / time	12-Mar-2024 09:04	12-Mar-2024 11:40	12-Mar-2024 13:25	12-Mar-2024 13:38	12-Mar-2024 13:59
Compound	CAS Number	LOR	Unit		EP2403216-001	EP2403216-002	EP2403216-003	EP2403216-004	EP2403216-005
					Result	Result	Result	Result	Result
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
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		**0.05**	**21.5**	<0.01	**0.03**	**1.17**
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		**0.05**	**15.0**	<0.01	**0.02**	**1.14**
Sum of PFAS (WA DER List)	----	0.01	µg/L		**0.05**	**19.2**	<0.01	**0.03**	**1.17**
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**111**	**106**	**112**	**110**	**106**
13C8-PFOA	----	0.02	%		**116**	**120**	**117**	**112**	**110**

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW199_240312	0089_QC301_240312	0089_QC401_240312	0089_QC402_240312	0089_QC302_240312
				Sampling date / time	12-Mar-2024 14:24	12-Mar-2024 15:04	12-Mar-2024 15:06	12-Mar-2024 15:07	12-Mar-2024 15:08
Compound	CAS Number	LOR	Unit		EP2403216-006	EP2403216-007	EP2403216-008	EP2403216-009	EP2403216-010
					Result	Result	Result	Result	Result
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	----	----	----	----
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	----	----	----	----
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		**720**	----	----	----	----
Total Alkalinity as CaCO3	----	1	mg/L		**720**	----	----	----	----
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		**600**	----	----	----	----
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		**6040**	----	----	----	----
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		**250**	----	----	----	----
Magnesium	7439-95-4	1	mg/L		**470**	----	----	----	----
Sodium	7440-23-5	1	mg/L		**3300**	----	----	----	----
Potassium	7440-09-7	1	mg/L		**145**	----	----	----	----
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		**197**	----	----	----	----
ø Total Cations	----	0.01	meq/L		**198**	----	----	----	----
ø Ionic Balance	----	0.01	%		**0.29**	----	----	----	----
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

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW199_240312	0089_QC301_240312	0089_QC401_240312	0089_QC402_240312	0089_QC302_240312
				Sampling date / time	12-Mar-2024 14:24	12-Mar-2024 15:04	12-Mar-2024 15:06	12-Mar-2024 15:07	12-Mar-2024 15:08
Compound	CAS Number	LOR	Unit		EP2403216-006	EP2403216-007	EP2403216-008	EP2403216-009	EP2403216-010
					Result	Result	Result	Result	Result
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
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									

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW199_240312	0089_QC301_240312	0089_QC401_240312	0089_QC402_240312	0089_QC302_240312
				Sampling date / time	12-Mar-2024 14:24	12-Mar-2024 15:04	12-Mar-2024 15:06	12-Mar-2024 15:07	12-Mar-2024 15:08
Compound	CAS Number	LOR	Unit		EP2403216-006	EP2403216-007	EP2403216-008	EP2403216-009	EP2403216-010
					Result	Result	Result	Result	Result
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
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**	**111**	**110**	**110**	**108**
13C8-PFOA	----	0.02	%		**108**	**108**	**106**	**111**	**113**

Analytical Results

Sub-Matrix: RINSATE (Matrix: WATER)				Sample ID	0089_QC303_240312	0089_QC403_240312	----	----	----
				Sampling date / time	12-Mar-2024 15:11	12-Mar-2024 15:12	----	----	----
Compound	CAS Number	LOR	Unit		EP2403216-011	EP2403216-012	--------	--------	--------
					Result	Result	----	----	----
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		<0.01	<0.01	----	----	----
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		<0.01	<0.01	----	----	----
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	<0.02	----	----	----
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		<0.1	<0.1	----	----	----
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		<0.01	<0.01	----	----	----
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		<0.05	<0.05	----	----	----
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L		<0.02	<0.02	----	----	----
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L		<0.05	<0.05	----	----	----

Analytical Results

Sub-Matrix: RINSATE (Matrix: WATER)				Sample ID	0089_QC303_240312	0089_QC403_240312	----	----	----
				Sampling date / time	12-Mar-2024 15:11	12-Mar-2024 15:12	----	----	----
Compound	CAS Number	LOR	Unit		EP2403216-011	EP2403216-012	--------	--------	--------
					Result	Result	----	----	----
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L		<0.05	<0.05	----	----	----
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L		<0.05	<0.05	----	----	----
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L		<0.05	<0.05	----	----	----
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L		<0.02	<0.02	----	----	----
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L		<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	----	----	----
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		<0.05	<0.05	----	----	----
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		<0.05	<0.05	----	----	----
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L		<0.05	<0.05	----	----	----
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L		<0.01	<0.01	----	----	----
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		<0.01	<0.01	----	----	----
Sum of PFAS (WA DER List)	----	0.01	µg/L		<0.01	<0.01	----	----	----
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**116**	**104**	----	----	----
13C8-PFOA	----	0.02	%		**114**	**118**	----	----	----

Surrogate Control Limits

Sub-Matrix: **GROUNDWATER**		Recovery Limits (%)	
Compound	*CAS Number*	**Low**	**High**
EP231S: PFAS Surrogate			
13C4-PFOS	----	65	140
13C8-PFOA	----	71	133

Sub-Matrix: **RINSATE**		Recovery Limits (%)	
Compound	*CAS Number*	**Low**	**High**
EP231S: PFAS Surrogate			
13C4-PFOS	----	65	140
13C8-PFOA	----	71	133

QUALITY CONTROL REPORT

Work Order	: **EP2403216**	Page	: 1 of 9
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: Customer Services EP
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: +61-8-9406 1301
Project	: WA_0089_PFASOMP_24	Date Samples Received	: 13-Mar-2024
Order number	: pfas-omp/Stirling	Date Analysis Commenced	: 15-Mar-2024
C-O-C number	: 64944	Issue Date	: 25-Mar-2024
Sampler	: [redacted] [redacted]		
Site	: Stirling GW - CG		
Quote number	: SY/139/19 B		
No. of samples received	: 12		
No. of samples analysed	: 12		

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]	Inorganics Supervisor	Perth Inorganics, Wangara, WA
[redacted]	Senior Organic Chemist	Perth Organics, Wangara, WA

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 (%)*
ED037P: Alkalinity by PC Titrator (QC Lot: 5671371)									
EP2403216-002	0089_MW193_240312	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	1030	1030	0.0	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	1030	1030	0.0	0% - 20%
EP2403218-005	Anonymous	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	266	264	0.6	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	266	264	0.6	0% - 20%
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QC Lot: 5666028)									
EP2403216-001	0089_MW202_240312	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	41	48	16.4	0% - 20%
EP2403226-005	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	83	82	1.6	0% - 20%
ED045G: Chloride by Discrete Analyser (QC Lot: 5666029)									
EP2403216-001	0089_MW202_240312	ED045G: Chloride	16887-00-6	1	mg/L	195	194	0.5	0% - 20%
EP2403226-005	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	860	871	1.3	0% - 20%
ED093F: Dissolved Major Cations (QC Lot: 5666285)									
EP2403216-001	0089_MW202_240312	ED093F: Calcium	7440-70-2	1	mg/L	105	105	0.0	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	25	25	0.0	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	128	128	0.0	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	6	6	0.0	No Limit
EP2403218-005	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	123	124	1.1	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 (%)*
ED093F: Dissolved Major Cations (QC Lot: 5666285) - continued									
EP2403218-005	Anonymous	ED093F: Magnesium	7439-95-4	1	mg/L	14	14	0.0	0% - 50%
		ED093F: Sodium	7440-23-5	1	mg/L	36	36	0.0	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	3	3	0.0	No Limit
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 5669248)									
EP2403216-002	0089_MW193_240312	EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01 (0.04)*	µg/L	11.5	10.6	8.3	0% - 20%
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	3.50	3.51	0.0	0% - 20%
		EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	0.78	0.81	3.4	0% - 20%
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	1.45	1.38	5.1	0% - 20%
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	0.84	0.78	7.8	0% - 20%
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
EP2403218-006	Anonymous	EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	0.02	0.02	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
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 5669248)									
EP2403216-002	0089_MW193_240312	EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	0.85	0.86	0.0	0% - 20%
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	0.34	0.35	3.5	0% - 50%
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	1.62	1.60	1.7	0% - 20%
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	0.26	0.24	7.6	0% - 50%
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	0.04	0.04	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	0.3	0.3	0.0	No Limit
EP2403218-006	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

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: 5669248) - continued									
EP2403218-006	Anonymous	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: 5669248)									
EP2403216-002	0089_MW193_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
EP2403218-006	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: 5669248)									
EP2403216-002	0089_MW193_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
EP2403218-006	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

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: 5669248) - continued									
EP2403218-006	Anonymous	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: 5669248)									
EP2403216-002	0089_MW193_240312	EP231X: Sum of PFAS	----	0.01	µg/L	21.5	20.5	4.8	0% - 20%
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01 (0.04)*	µg/L	15.0	14.1	6.1	0% - 20%
		EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	19.2	18.3	4.7	0% - 20%
EP2403218-006	Anonymous	EP231X: Sum of PFAS	----	0.01	µg/L	0.02	0.02	0.0	No Limit
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	0.02	0.02	0.0	No Limit
		EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	0.02	0.02	0.0	No Limit

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
ED037P: Alkalinity by PC Titrator (QCLot: 5671371)								
ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	----	----	----	----
ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	----	----	----	----
ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	<1	----	----	----	----
ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	<1	20 mg/L	95.6	85.1	126
				<1	200 mg/L	101	90.5	111
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 5666028)								
ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<1	25 mg/L	104	89.9	112
				<1	500 mg/L	102	89.9	112
ED045G: Chloride by Discrete Analyser (QCLot: 5666029)								
ED045G: Chloride	16887-00-6	1	mg/L	<1	10 mg/L	101	88.6	113
				<1	1000 mg/L	102	88.6	113
ED093F: Dissolved Major Cations (QCLot: 5666285)								
ED093F: Calcium	7440-70-2	1	mg/L	<1	50 mg/L	101	86.5	117
ED093F: Magnesium	7439-95-4	1	mg/L	<1	50 mg/L	100	88.4	110
ED093F: Sodium	7440-23-5	1	mg/L	<1	50 mg/L	99.2	91.4	113
ED093F: Potassium	7440-09-7	1	mg/L	<1	50 mg/L	96.2	84.6	108
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5669248)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.2218 µg/L	90.6	72.0	130
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.2352 µg/L	89.5	71.0	127
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	0.2373 µg/L	90.4	68.0	131
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.238 µg/L	86.3	69.0	134
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.232 µg/L	89.4	65.0	140
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.241 µg/L	95.2	53.0	142
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5669248)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	1.25 µg/L	109	73.0	129
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	0.25 µg/L	100	72.0	129
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	0.25 µg/L	93.6	72.0	129
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	0.25 µg/L	94.2	72.0	130
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	0.25 µg/L	99.6	71.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	0.25 µg/L	103	69.0	130

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
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5669248) - continued								
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	0.25 µg/L	99.2	71.0	129
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	0.25 µg/L	119	69.0	133
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	0.25 µg/L	90.6	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	0.25 µg/L	114	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5669248)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.25 µg/L	115	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	0.625 µg/L	105	68.0	141
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	0.625 µg/L	119	60.5	138
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	0.625 µg/L	94.6	68.3	134
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	0.625 µg/L	102	62.2	138
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	0.25 µg/L	103	65.0	136
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	0.25 µg/L	86.4	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5669248)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.2343 µg/L	122	63.0	143
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	0.2378 µg/L	112	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	0.24 µg/L	114	67.0	138
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	0.241 µg/L	112	64.2	133
EP231P: PFAS Sums (QCLot: 5669248)								
EP231X: Sum of PFAS	----	0.01	µg/L	<0.01	----	----	----	----
EP231X: Sum of PFHxS and PFOS	355-46-4/17 63-23-1	0.01	µg/L	<0.01	----	----	----	----
EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	<0.01	----	----	----	----

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
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 5666028)							
EP2403216-001	0089_MW202_240312	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	100 mg/L	92.0	70.4	130

Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*Concentration*	*MS*	*Low*	*High*
ED045G: Chloride by Discrete Analyser (QCLot: 5666029)							
EP2403216-001	0089_MW202_240312	ED045G: Chloride	16887-00-6	200 mg/L	112	70.0	130
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5669248)							
EP2403218-001	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.2218 µg/L	95.9	72.0	129
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.232 µg/L	103	71.0	127
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.2352 µg/L	90.7	68.0	129
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.238 µg/L	92.4	69.0	134
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.232 µg/L	91.0	65.0	140
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.241 µg/L	87.4	53.0	129
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5669248)							
EP2403218-001	Anonymous	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	1.25 µg/L	131	73.0	142
		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	87.7	72.0	129
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.25 µg/L	97.3	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	106	69.0	130
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.25 µg/L	103	71.0	134
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.25 µg/L	109	69.0	133
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.25 µg/L	97.9	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	0.25 µg/L	97.2	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5669248)							
EP2403218-001	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.25 µg/L	120	59.0	135
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.625 µg/L	111	70.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.625 µg/L	124	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.625 µg/L	99.6	70.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.625 µg/L	98.3	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.25 µg/L	104	65.0	136
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.25 µg/L	104	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5669248)							
EP2403218-001	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.234 µg/L	112	63.0	143
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.2378 µg/L	109	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.24 µg/L	105	67.0	138
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.2415 µg/L	94.9	70.0	130

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **EP2403216**	Page	: 1 of 5
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Telephone	: +61-8-9406 1301
Project	: WA_0089_PFASOMP_24	Date Samples Received	: 13-Mar-2024
Site	: Stirling GW - CG	Issue Date	: 25-Mar-2024
Sampler	: [redacted]	No. of samples received	: 12
Order number	: pfas-omp/Stirling	No. of samples analysed	: 12

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
ED037P: Alkalinity by PC Titrator								
Clear Plastic Bottle - Natural (ED037-P)								
0089_MW202_240312,	0089_MW193_240312,	**12-Mar-2024**	**----**	----	----	**19-Mar-2024**	26-Mar-2024	✓
0089_MW195S_240312,	0089_MW195D_240312,							
0089_MW128_240312,	0089_MW199_240312							
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA								
Clear Plastic Bottle - Natural (ED041G)								
0089_MW202_240312,	0089_MW193_240312,	**12-Mar-2024**	**----**	----	----	**23-Mar-2024**	09-Apr-2024	✓
0089_MW195S_240312,	0089_MW195D_240312,							
0089_MW128_240312,	0089_MW199_240312							
ED045G: Chloride by Discrete Analyser								
Clear Plastic Bottle - Natural (ED045G)								
0089_MW202_240312,	0089_MW193_240312,	**12-Mar-2024**	**----**	----	----	**23-Mar-2024**	09-Apr-2024	✓
0089_MW195S_240312,	0089_MW195D_240312,							
0089_MW128_240312,	0089_MW199_240312							
ED093F: Dissolved Major Cations								
Clear Plastic Bottle - Natural (ED093F)								
0089_MW202_240312,	0089_MW193_240312,	**12-Mar-2024**	**----**	----	----	**19-Mar-2024**	19-Mar-2024	✓
0089_MW195S_240312,	0089_MW195D_240312,							
0089_MW128_240312,	0089_MW199_240312							
EP231A: Perfluoroalkyl Sulfonic Acids								
HDPE (no PTFE) (EP231X)								
0089_MW202_240312,	0089_MW193_240312,	**12-Mar-2024**	**18-Mar-2024**	08-Sep-2024	✓	**19-Mar-2024**	08-Sep-2024	✓
0089_MW195S_240312,	0089_MW195D_240312,							
0089_MW128_240312,	0089_MW199_240312,							
0089_QC301_240312,	0089_QC401_240312,							
0089_QC402_240312,	0089_QC302_240312,							
0089_QC303_240312,	0089_QC403_240312							

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)								
0089_MW202_240312,	0089_MW193_240312,	**12-Mar-2024**	**18-Mar-2024**	08-Sep-2024	✓	**19-Mar-2024**	08-Sep-2024	✓
0089_MW195S_240312,	0089_MW195D_240312,							
0089_MW128_240312,	0089_MW199_240312,							
0089_QC301_240312,	0089_QC401_240312,							
0089_QC402_240312,	0089_QC302_240312,							
0089_QC303_240312,	0089_QC403_240312							
EP231C: Perfluoroalkyl Sulfonamides								
HDPE (no PTFE) (EP231X)								
0089_MW202_240312,	0089_MW193_240312,	**12-Mar-2024**	**18-Mar-2024**	08-Sep-2024	✓	**19-Mar-2024**	08-Sep-2024	✓
0089_MW195S_240312,	0089_MW195D_240312,							
0089_MW128_240312,	0089_MW199_240312,							
0089_QC301_240312,	0089_QC401_240312,							
0089_QC402_240312,	0089_QC302_240312,							
0089_QC303_240312,	0089_QC403_240312							
EP231D: (n:2) Fluorotelomer Sulfonic Acids								
HDPE (no PTFE) (EP231X)								
0089_MW202_240312,	0089_MW193_240312,	**12-Mar-2024**	**18-Mar-2024**	08-Sep-2024	✓	**19-Mar-2024**	08-Sep-2024	✓
0089_MW195S_240312,	0089_MW195D_240312,							
0089_MW128_240312,	0089_MW199_240312,							
0089_QC301_240312,	0089_QC401_240312,							
0089_QC402_240312,	0089_QC302_240312,							
0089_QC303_240312,	0089_QC403_240312							
EP231P: PFAS Sums								
HDPE (no PTFE) (EP231X)								
0089_MW202_240312,	0089_MW193_240312,	**12-Mar-2024**	**18-Mar-2024**	08-Sep-2024	✓	**19-Mar-2024**	08-Sep-2024	✓
0089_MW195S_240312,	0089_MW195D_240312,							
0089_MW128_240312,	0089_MW199_240312,							
0089_QC301_240312,	0089_QC401_240312,							
0089_QC402_240312,	0089_QC302_240312,							
0089_QC303_240312,	0089_QC403_240312							

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)							
Alkalinity by Auto Titrator	ED037-P	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	18	**11.11**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	19	**10.53**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	18	**11.11**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Alkalinity by Auto Titrator	ED037-P	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	18	**11.11**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	19	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	18	**11.11**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Alkalinity by Auto Titrator	ED037-P	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	1	18	**5.56**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	19	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	18	**5.56**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Chloride by Discrete Analyser	ED045G	1	18	**5.56**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	19	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	18	**5.56**	**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
Alkalinity by Auto Titrator	ED037-P	WATER	In house: Referenced to APHA 2320 B This procedure determines alkalinity by automated measurement (e.g. PC Titrate) on a settled supernatant aliquot of the sample using pH 4.5 for indicating the total alkalinity end-point. This method is compliant with NEPM Schedule B(3)
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	WATER	In house: Referenced to APHA 4500-SO4. Dissolved sulfate is determined in a 0.45um filtered sample. Sulfate ions are converted to a barium sulfate suspension in an acetic acid medium with barium chloride. Light absorbance of the BaSO4 suspension is measured by a photometer and the SO4-2 concentration is determined by comparison of the reading with a standard curve. This method is compliant with NEPM Schedule B(3)
Chloride by Discrete Analyser	ED045G	WATER	In house: Referenced to APHA 4500 Cl - G.The thiocyanate ion is liberated from mercuric thiocyanate through sequestration of mercury by the chloride ion to form non-ionised mercuric chloride. In the presence of ferric ions the liberated thiocynate forms highly-coloured ferric thiocynate which is measured at 480 nm.
Major Cations - Dissolved	ED093F	WATER	In house: Referenced to APHA 3120 and 3125; USEPA SW 846 - 6010 and 6020; Cations are determined by either ICP-AES or ICP-MS techniques. This method is compliant with NEPM Schedule B(3) Sodium Adsorption Ratio is calculated from Ca, Mg and Na which determined by ALS in house method QWI-EN/ED093F. This method is compliant with NEPM Schedule B(3) Hardness parameters are calculated based on APHA 2340 B. This method is compliant with NEPM Schedule B(3)
Ionic Balance by PCT DA and Turbi SO4 DA	* EN055 - PG	WATER	In house: Referenced to APHA 1030F. This method is compliant with NEPM Schedule B(3)
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.

ALSCompass
SAMPLING *Intelligence*

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Environmental Division
Perth
Work Order Reference
EP2403217

Telephone - 61-8-9406 1301

Custody Document for Submissions via ALS Compass App

Project: WA_0089_PFASOMP_24 **Client:** Stantec

Project Manager: [redacted]
Phone: [redacted]

ALS Compass COC Reference: 64954; 64944; 64940; 64939; 64941; 64947; 64949 **# Samples:**

Sampler: [redacted]
Phone: [redacted]

Turnaround Requirements: Standard Urgent

Special Instructions:

Custody:

Relinquished by:	Received by:	Relinquished by:	Received by:
[redacted]	[redacted]		
Date / Time: 12/3/24 - 3:04pm	Date / Time: 13/3 1215	Date / Time:	Date / Time:

CHAIN OF CUSTODY

(ALS) COC#: 64949 *ALS Laboratory:* EP Perth Environmental

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

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP_24

SITE: Stirling SD - CG

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted] SAMPLER MOBILE [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES 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 Sediments SEDIMENT	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
001	0089_SD368		12/03/2024 09:31 AM	SOIL	ALS: 1 Non ALS: 0	No	X		
002	0089_SD304		12/03/2024 09:54 AM	SOIL	ALS: 1 Non ALS: 0	No	X		
003	0089_QC110		12/03/2024 09:55 AM	SOIL	ALS: 1 Non ALS: 0	No	X		

CHAIN OF CUSTODY

COC#: 64949 ALS Laboratory: EP Perth Environmental

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

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP_24

SITE: Stirling SD - CG

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES 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	0089_SD368	HDPE Soil Jar	200 mL	00621222089039	Grey	No	
002	0089_SD304	HDPE Soil Jar	200 mL	00621222089115	Grey	No	
003	0089_QC110	HDPE Soil Jar	200 mL	00621222089153	Grey	No	

Total Bottle Count: ALS: 3, Non ALS: 0

SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : **EP2403217**

Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: Customer Services EP
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
E-mail	: [redacted]stantec.com	E-mail	: ALSEnviro.Perth@alsglobal.com
Telephone	: ----	Telephone	: +61-8-9406 1301
Facsimile	: ----	Facsimile	: +61-8-9406 1399
Project	: WA_0089_PFASOMP_24	Page	: 1 of 2
Order number	: pfas-omp/Stirling	Quote number	: ES2022MWHAUS0002 (SY/139/19 B)
C-O-C number	: 64949	QC Level	: NEPM 2013 B3 & ALS QC Standard
Site	: Stirling SD - CG		
Sampler	: [redacted]		

Dates

Date Samples Received	: 13-Mar-2024 12:15	Issue Date	: 15-Mar-2024
Client Requested Due Date	: 22-Mar-2024	Scheduled Reporting Date	: **22-Mar-2024**

Delivery Details

Mode of Delivery	: Carrier	Security Seal	: Not Available
No. of coolers/boxes	: 2	Temperature	: 14.9 - Ice present
Receipt Detail	:	No. of samples received / analysed	: 3 / 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 see scanned COC for sample discrepencies: extra samples , samples not received etc.
- Please direct any queries related to sample condition / numbering / breakages to Sample Receipt (Samples.Perth@alsglobal.com)
- Analytical work for this work order will be conducted at ALS Environmental Perth.
- Please direct any turnaround / technical queries to the laboratory contact designated above.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months) from receipt of samples.
- **pH analysis should be conducted within 6 hours of sampling.**
- **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.**
- 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: **SOIL**

Laboratory sample ID	Sampling date / time	Sample ID	SOIL - EA055-103 Moisture Content	SOIL - EP231X (solids) PFAS - Full Suite (28 analytes)
EP2403217-001	12-Mar-2024 09:31	0089_SD368_240312	✓	✓
EP2403217-002	12-Mar-2024 09:54	0089_SD304_240312	✓	✓
EP2403217-003	12-Mar-2024 09:55	0089_QC110_240312	✓	✓

Proactive Holding Time Report

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

Requested Deliverables

[redacted]
- A4 - AU Tax Invoice (INV) — Email — [redacted]cardno.com.au

DERP LAB REPORTS
- *AU Certificate of Analysis - NATA (COA) — Email — derp.labreports@esdat.com.au
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI) — Email — derp.labreports@esdat.com.au
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC) — Email — derp.labreports@esdat.com.au
- A4 - AU Sample Receipt Notification - Environmental HT (SRN) — Email — derp.labreports@esdat.com.au
- Chain of Custody (CoC) (COC) — Email — derp.labreports@esdat.com.au
- EDI Format - ESDAT (ESDAT) — Email — derp.labreports@esdat.com.au
- EDI Format - XTab (XTAB) — Email — derp.labreports@esdat.com.au

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

CERTIFICATE OF ANALYSIS

Work Order	: **EP2403217**	Page	: 1 of 5
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: Customer Services EP
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: +61-8-9406 1301
Project	: WA_0089_PFASOMP_24	Date Samples Received	: 13-Mar-2024 12:15
Order number	: pfas-omp/Stirling	Date Analysis Commenced	: 18-Mar-2024
C-O-C number	: 64949	Issue Date	: 21-Mar-2024 23:39
Sampler	: [redacted] [redacted]		
Site	: Stirling SD - CG		
Quote number	: SY/139/19 B		
No. of samples received	: 3		
No. of samples analysed	: 3		

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]	Inorganics Supervisor	Perth Inorganics, Wangara, WA
[redacted]	Senior Organic Chemist	Perth Organics, Wangara, WA

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.

- 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: SEDIMENT (Matrix: SOIL)				Sample ID	0089_SD368_240312	0089_SD304_240312	0089_QC110_240312	----	----
				Sampling date / time	12-Mar-2024 09:31	12-Mar-2024 09:54	12-Mar-2024 09:55	----	----
Compound	CAS Number	LOR	Unit		EP2403217-001	EP2403217-002	EP2403217-003	--------	--------
					Result	Result	Result	----	----
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content	----	0.1	%		**30.0**	**36.6**	**31.9**	**----**	**----**
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	**----**	**----**
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	**----**	**----**
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	**----**	**----**
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	**----**	**----**
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg		**0.0002**	<0.0002	**0.0002**	**----**	**----**
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	**----**	**----**
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg		<0.001	<0.001	<0.001	**----**	**----**
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	**----**	**----**
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	**----**	**----**
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	**----**	**----**
Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	**----**	**----**
Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	**----**	**----**
Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	**----**	**----**
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	**----**	**----**
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	**----**	**----**
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	**----**	**----**
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	**----**	**----**
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	**----**	**----**

Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)				Sample ID	0089_SD368_240312	0089_SD304_240312	0089_QC110_240312	----	----
				Sampling date / time	12-Mar-2024 09:31	12-Mar-2024 09:54	12-Mar-2024 09:55	----	----
Compound	CAS Number	LOR	Unit		EP2403217-001	EP2403217-002	EP2403217-003	--------	--------
					Result	Result	Result	----	----
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	----	----
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	----	----
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	----	----
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	----	----
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	----	----
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	----	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	----	----
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	----	----
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	----	----
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	----	----
EP231P: PFAS Sums									
Sum of PFAS	----	0.0002	mg/kg		**0.0002**	<0.0002	**0.0002**	----	----
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg		**0.0002**	<0.0002	**0.0002**	----	----
Sum of PFAS (WA DER List)	----	0.0002	mg/kg		**0.0002**	<0.0002	**0.0002**	----	----
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.0002	%		**95.0**	**100**	**104**	----	----
13C8-PFOA	----	0.0002	%		**100**	**98.5**	**101**	----	----

Surrogate Control Limits

Sub-Matrix: **SEDIMENT**		Recovery Limits (%)	
Compound	*CAS Number*	*Low*	*High*
EP231S: PFAS Surrogate			
13C4-PFOS	----	76	136
13C8-PFOA	----	78	131

QUALITY CONTROL REPORT

Work Order	: **EP2403217**	Page	: 1 of 7
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: Customer Services EP
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: +61-8-9406 1301
Project	: WA_0089_PFASOMP_24	Date Samples Received	: 13-Mar-2024
Order number	: pfas-omp/Stirling	Date Analysis Commenced	: 18-Mar-2024
C-O-C number	: 64949	Issue Date	: 21-Mar-2024
Sampler	: [redacted] [redacted]		
Site	: Stirling SD - CG		
Quote number	: SY/139/19 B		
No. of samples received	: 3		
No. of samples analysed	: 3		

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]	Inorganics Supervisor	Perth Inorganics, Wangara, WA
[redacted]	Senior Organic Chemist	Perth Organics, Wangara, WA

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: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
EA055: Moisture Content (Dried @ 105-110°C) (QC Lot: 5672500)									
EP2403217-001	0089_SD368_240312	EA055: Moisture Content	----	0.1	%	30.0	30.3	1.1	0% - 20%
EP2403225-007	Anonymous	EA055: Moisture Content	----	0.1	%	14.6	14.2	2.7	0% - 20%
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 5666652)									
EP2403217-001	0089_SD368_240312	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	0.0002	0.0003	41.9	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
EP2403225-007	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 5666652)									
EP2403217-001	0089_SD368_240312	EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit

Sub-Matrix: **SOIL**

				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: 5666652) - continued									
EP2403217-001	0089_SD368_240312	EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	<0.001	0.0	No Limit
EP2403225-007	Anonymous	EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	<0.001	0.0	No Limit
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 5666652)									
EP2403217-001	0089_SD368_240312	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
EP2403225-007	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit

Sub-Matrix: **SOIL**

				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: 5666652) - continued									
EP2403225-007	Anonymous	EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 5666652)									
EP2403217-001	0089_SD368_240312	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
EP2403225-007	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
EP231P: PFAS Sums (QC Lot: 5666652)									
EP2403217-001	0089_SD368_240312	EP231X: Sum of PFAS	----	0.0002	mg/kg	0.0002	0.0003	40.0	No Limit
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg	0.0002	0.0003	40.0	No Limit
		EP231X: Sum of PFAS (WA DER List)	----	0.0002	mg/kg	0.0002	0.0003	40.0	No Limit
EP2403225-007	Anonymous	EP231X: Sum of PFAS	----	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Sum of PFAS (WA DER List)	----	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit

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: **SOIL**

				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: 5666652)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	0.0011 mg/kg	99.5	72.0	128
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	0.00125 mg/kg	104	73.0	123
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	0.00118 mg/kg	94.5	67.0	130
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	0.00119 mg/kg	100	70.0	132
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	0.00116 mg/kg	94.4	68.0	136
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	0.0012 mg/kg	94.2	59.0	134
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5666652)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	0.00625 mg/kg	110	71.0	135
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	0.00125 mg/kg	101	69.0	132
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	0.00125 mg/kg	96.4	70.0	132
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	0.00125 mg/kg	98.0	71.0	131
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	102	69.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	104	72.0	129
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	0.00125 mg/kg	92.0	69.0	133
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	106	64.0	136
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	102	69.0	135
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	96.0	66.0	139
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	0.00125 mg/kg	91.6	69.0	133
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5666652)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	0.00125 mg/kg	96.0	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	0.00312 mg/kg	113	59.6	143
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	0.00312 mg/kg	103	62.8	140
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	0.00312 mg/kg	114	61.5	139
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	0.00312 mg/kg	103	61.9	139
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	0.00125 mg/kg	103	63.0	144
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	0.00125 mg/kg	94.8	61.0	139
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5666652)								

Sub-Matrix: **SOIL**

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: 5666652) - continued								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	0.00117 mg/kg	113	62.0	145
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	0.00118 mg/kg	106	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	0.0012 mg/kg	112	65.0	137
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	0.0012 mg/kg	83.3	54.8	124
EP231P: PFAS Sums (QCLot: 5666652)								
EP231X: Sum of PFAS	----	0.0002	mg/kg	<0.0002	----	----	----	----
EP231X: Sum of PFHxS and PFOS	355-46-4/17 63-23-1	0.0002	mg/kg	<0.0002	----	----	----	----
EP231X: Sum of PFAS (WA DER List)	----	0.0002	mg/kg	<0.0002	----	----	----	----

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: **SOIL**

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: 5666652)							
EP2403217-002	0089_SD304_240312	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0011 mg/kg	102	72.0	128
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.00117 mg/kg	114	73.0	123
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.00118 mg/kg	97.9	67.0	130
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.00119 mg/kg	101	70.0	132
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.00116 mg/kg	94.5	68.0	136
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0012 mg/kg	103	59.0	134
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5666652)							
EP2403217-002	0089_SD304_240312	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.00625 mg/kg	131	71.0	135
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.00125 mg/kg	97.2	69.0	132
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.00125 mg/kg	94.4	70.0	132
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.00125 mg/kg	97.2	71.0	131
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.00125 mg/kg	100	69.0	133
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.00125 mg/kg	102	72.0	129
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.00125 mg/kg	93.2	69.0	133
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.00125 mg/kg	107	64.0	136
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.00125 mg/kg	99.6	69.0	135
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.00125 mg/kg	97.2	66.0	139
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.00125 mg/kg	96.8	69.0	133
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5666652)							

Sub-Matrix: **SOIL**

				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: 5666652) - continued							
EP2403217-002	0089_SD304_240312	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.00125 mg/kg	95.2	48.0	128
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.00312 mg/kg	112	60.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.00312 mg/kg	103	60.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.00312 mg/kg	106	60.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.00312 mg/kg	109	60.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.00125 mg/kg	104	63.0	144
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.00125 mg/kg	100	61.0	139
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5666652)							
EP2403217-002	0089_SD304_240312	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.00117 mg/kg	107	62.0	145
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.00118 mg/kg	109	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0012 mg/kg	104	65.0	137
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0012 mg/kg	77.5	60.0	130

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **EP2403217**	Page	: 1 of 4
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Telephone	: +61-8-9406 1301
Project	: WA_0089_PFASOMP_24	Date Samples Received	: 13-Mar-2024
Site	: Stirling SD - CG	Issue Date	: 21-Mar-2024
Sampler	: [redacted]	No. of samples received	: 3
Order number	: pfas-omp/Stirling	No. of samples analysed	: 3

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: **SOIL**

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
EA055: Moisture Content (Dried @ 105-110°C)								
HDPE Soil Jar (EA055)								
0089_SD368_240312,	0089_SD304_240312,	**12-Mar-2024**	**----**	----	----	**19-Mar-2024**	26-Mar-2024	✓
0089_QC110_240312								
EP231A: Perfluoroalkyl Sulfonic Acids								
HDPE Soil Jar (EP231X)								
0089_SD368_240312,	0089_SD304_240312,	**12-Mar-2024**	**18-Mar-2024**	08-Sep-2024	✓	**18-Mar-2024**	27-Apr-2024	✓
0089_QC110_240312								
EP231B: Perfluoroalkyl Carboxylic Acids								
HDPE Soil Jar (EP231X)								
0089_SD368_240312,	0089_SD304_240312,	**12-Mar-2024**	**18-Mar-2024**	08-Sep-2024	✓	**18-Mar-2024**	27-Apr-2024	✓
0089_QC110_240312								
EP231C: Perfluoroalkyl Sulfonamides								
HDPE Soil Jar (EP231X)								
0089_SD368_240312,	0089_SD304_240312,	**12-Mar-2024**	**18-Mar-2024**	08-Sep-2024	✓	**18-Mar-2024**	27-Apr-2024	✓
0089_QC110_240312								
EP231D: (n:2) Fluorotelomer Sulfonic Acids								
HDPE Soil Jar (EP231X)								
0089_SD368_240312,	0089_SD304_240312,	**12-Mar-2024**	**18-Mar-2024**	08-Sep-2024	✓	**18-Mar-2024**	27-Apr-2024	✓
0089_QC110_240312								
EP231P: PFAS Sums								
HDPE Soil Jar (EP231X)								
0089_SD368_240312,	0089_SD304_240312,	**12-Mar-2024**	**18-Mar-2024**	08-Sep-2024	✓	**18-Mar-2024**	27-Apr-2024	✓
0089_QC110_240312								

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: **SOIL**

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)							
Moisture Content	EA055	2	11	**18.18**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	20	**5.00**	**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
Moisture Content	EA055	SOIL	In house: A gravimetric procedure based on weight loss over a 12 hour drying period at 105-110 degrees C. This method is compliant with NEPM Schedule B(3).
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	SOIL	In-house: Analysis of soils by solvent extraction followed by LC-Electrospray-MS-MS, Negative Mode using MRM using internal standard quantitation. Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to a portion of soil which is then extracted with MTBE and an ion pairing reagent. A portion of extract is exchanged into the analytical solvent mixture, combined with an equal volume reagent water and 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
QuECheRS Extraction of Solids	* ORG71	SOIL	In house: Sequential extractions with Acetonitrile/Methanol by shaking. Extraction efficiency aided by the addition of salts under acidic conditions. Where relevant, interferences from co-extracted organics are removed with dispersive clean-up media (dSPE). The extract is either diluted or concentrated and exchanged into the analytical solvent.

ALSCompass
SAMPLING *Intelligence*

Environmental Division
Perth
Work Order Reference
EP2403218

Telephone : +61-8-9406 1301

Custody Document for Submissions via ALS Compass App

Project: WA_0089_PFASOMP_24 **Client:** Stantec **Project Manager:** [redacted]

Phone: ( )

ALS Compass COC Reference: 64954; 64944; 64940; 64939; 64941; 64947; 64949 **# Samples:** **Sampler:** [redacted]

Phone: ( )

Turnaround Requirements: Standard Urgent

Special Instructions:

Custody:

Relinquished by:	Received by:	Relinquished by:	Received by:
[redacted]	[redacted]		
Date / Time: 12/3/24 - 3:09pm	Date / Time: 13/3 1215	Date / Time:	Date / Time:

CHAIN OF CUSTODY

COC#: **64954** *ALS Laboratory:* EP Perth Environmental

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

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP_24

SITE: Stirling GW - JS

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES 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	WA OMP Water Suite WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
001	0089_MW233		12/03/2024 09:58 AM	WATER	ALS: 5 Non ALS: 0	No	X		
002	0089_MW236		12/03/2024 10:15 AM	WATER	ALS: 3 Non ALS: 0	No	X		
003	0089_MW243		12/03/2024 10:41 AM	WATER	ALS: 3 Non ALS: 0	No	X		
004	0089_MW240		12/03/2024 10:56 AM	WATER	ALS: 3 Non ALS: 0	No	X		
005	0089_QC116		12/03/2024 10:57 AM	WATER	ALS: 3 Non ALS: 0	No	X		
006	0089_MW238		12/03/2024 11:08 AM	WATER	ALS: 5 Non ALS: 0	No	X		
007	0089_MW239		12/03/2024 11:16 AM	WATER	ALS: 3 Non ALS: 0	No	X		

CHAIN OF CUSTODY

(ALS) COC#: **64954** *ALS Laboratory:* EP Perth Environmental

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

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP_24

SITE: Stirling GW - JS

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES 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	WA OMP Water Suite WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
008	0089_MW245		12/03/2024 11:28 AM	WATER	ALS: 3 Non ALS: 0	No	X		
009	0089_MW242		12/03/2024 01:18 PM	WATER	ALS: 3 Non ALS: 0	No	X		
010	0089_QC117		12/03/2024 12:00 PM	WATER	ALS: 3 Non ALS: 0	No	X		
011	0089_MW288		12/03/2024 01:19 PM	WATER	ALS: 3 Non ALS: 0	No	X		
012	0089_MW256		12/03/2024 02:12 PM	WATER	ALS: 5 Non ALS: 0	No	X		
013	0089_MW255		12/03/2024 02:22 PM	WATER	ALS: 3 Non ALS: 0	No	X		
014	0089_MW268		12/03/2024 02:38 PM	WATER	ALS: 5 Non ALS: 0	No	X		

CHAIN OF CUSTODY

COC#: 64954 ALS Laboratory: EP Perth Environmental

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

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP_24

SITE: Stirling GW - JS

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES 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	WA OMP Water Suite WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
015	0089_MW269		12/03/2024 02:49 PM	WATER	ALS: 5 Non ALS: 0	No	X		

CHAIN OF CUSTODY

COC#: 64954 ALS Laboratory: EP Perth Environmental

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

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP_24

SITE: Stirling GW - JS

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER:

CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]2

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO:

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	0089_MW233	HDPE (no PTFE)	20 mL	00350822058758	Grey	No	
001	0089_MW233	HDPE (no PTFE)	20 mL	00350822058763	Grey	No	
001	0089_MW233	HDPE (no PTFE)	20 mL	00352309050620	Grey	No	
001	0089_MW233	HDPE (no PTFE)	20 mL	00352309050492	Grey	No	
001	0089_MW233	Clear Plastic Bottle - Natural	125 mL	00070821217443	Green	No	
002	0089_MW236	HDPE (no PTFE)	20 mL	00352309050560	Grey	No	
002	0089_MW236	HDPE (no PTFE)	20 mL	00352309050446	Grey	No	
002	0089_MW236	Clear Plastic Bottle - Natural	125 mL	00070821217578	Green	No	
003	0089_MW243	HDPE (no PTFE)	20 mL	00352309050625	Grey	No	
003	0089_MW243	HDPE (no PTFE)	20 mL	00352309050574	Grey	No	
003	0089_MW243	Clear Plastic Bottle - Natural	125 mL	00070821217607	Green	No	
004	0089_MW240	Clear Plastic Bottle - Natural	125 mL	00070821217603	Green	No	
004	0089_MW240	HDPE (no PTFE)	20 mL	00352309050435	Grey	No	
004	0089_MW240	HDPE (no PTFE)	20 mL	00352309050612	Grey	No	
005	0089_QC116	Clear Plastic Bottle - Natural	125 mL	00070821217599	Green	No	
005	0089_QC116	HDPE (no PTFE)	20 mL	00352309050406	Grey	No	
005	0089_QC116	HDPE (no PTFE)	20 mL	00352309050405	Grey	No	
006	0089_MW238	Clear Plastic Bottle - Natural	125 mL	00070821217615	Green	No	
006	0089_MW238	HDPE (no PTFE)	20 mL	00352309050597	Grey	No	
006	0089_MW238	HDPE (no PTFE)	20 mL	00352309050680	Grey	No	
006	0089_MW238	HDPE (no PTFE)	20 mL	00350822058930	Grey	No	
006	0089_MW238	HDPE (no PTFE)	20 mL	00350822058773	Grey	No	
007	0089_MW239	HDPE (no PTFE)	20 mL	00352309050556	Grey	No	
007	0089_MW239	Clear Plastic Bottle - Natural	125 mL	00070821217504	Green	No	
007	0089_MW239	HDPE (no PTFE)	20 mL	00352309050380	Grey	No	
008	0089_MW245	Clear Plastic Bottle - Natural	125 mL	00070821217610	Green	No	

CHAIN OF CUSTODY

COC#: 64954 *ALS Laboratory:* EP Perth Environmental

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

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP_24

SITE: Stirling GW - JS

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES 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:

008	0089_MW245	HDPE (no PTFE)	20 mL	00352309050557	Grey	No	
008	0089_MW245	HDPE (no PTFE)	20 mL	00352309050499	Grey	No	
009	0089_MW242	Clear Plastic Bottle - Natural	125 mL	00070821217552	Green	No	
009	0089_MW242	HDPE (no PTFE)	20 mL	00352309050609	Grey	No	
009	0089_MW242	HDPE (no PTFE)	20 mL	00352309050575	Grey	No	
010	0089_QC117	Clear Plastic Bottle - Natural	125 mL	00070821217539	Green	No	
010	0089_QC117	HDPE (no PTFE)	20 mL	00352309050675	Grey	No	
010	0089_QC117	HDPE (no PTFE)	20 mL	00352309050397	Grey	No	
011	0089_MW288	Clear Plastic Bottle - Natural	125 mL	00070821217555	Green	No	
011	0089_MW288	HDPE (no PTFE)	20 mL	00352309050608	Grey	No	
011	0089_MW288	HDPE (no PTFE)	20 mL	00352309050387	Grey	No	
012	0089_MW256	HDPE (no PTFE)	20 mL	00350822058896	Grey	No	
012	0089_MW256	HDPE (no PTFE)	20 mL	00350822058782	Grey	No	
012	0089_MW256	HDPE (no PTFE)	20 mL	00352309066016	Grey	No	
012	0089_MW256	HDPE (no PTFE)	20 mL	00352309065937	Grey	No	
012	0089_MW256	Clear Plastic Bottle - Natural	125 mL	00070821217545	Green	No	
013	0089_MW255	Clear Plastic Bottle - Natural	125 mL	00070821217445	Green	No	
013	0089_MW255	HDPE (no PTFE)	20 mL	00352309050542	Grey	No	
013	0089_MW255	HDPE (no PTFE)	20 mL	00352309050665	Grey	No	
014	0089_MW268	HDPE (no PTFE)	20 mL	00350822058780	Grey	No	
014	0089_MW268	HDPE (no PTFE)	20 mL	00350822058980	Grey	No	
014	0089_MW268	Clear Plastic Bottle - Natural	125 mL	00070821217518	Green	No	
014	0089_MW268	HDPE (no PTFE)	20 mL	00352309050490	Grey	No	
014	0089_MW268	HDPE (no PTFE)	20 mL	00352309050456	Grey	No	
015	0089_MW269	Clear Plastic Bottle - Natural	125 mL	00070821217514	Green	No	
015	0089_MW269	HDPE (no PTFE)	20 mL	00352309050671	Grey	No	
015	0089_MW269	HDPE (no PTFE)	20 mL	00352309050627	Grey	No	

CHAIN OF CUSTODY

COC#: **64954** *ALS Laboratory:* EP Perth Environmental

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

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP_24

SITE: Stirling GW - JS

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES 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:			

015	0089_MW269	HDPE (no PTFE)	20 mL	00350822058979	Grey	No	
015	0089_MW269	HDPE (no PTFE)	20 mL	00350822058892	Grey	No	

Total Bottle Count: ALS: 55, Non ALS: 0

SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : **EP2403218**

Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: Customer Services EP
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
E-mail	: [redacted]stantec.com	E-mail	: ALSEnviro.Perth@alsglobal.com
Telephone	: ----	Telephone	: +61-8-9406 1301
Facsimile	: ----	Facsimile	: +61-8-9406 1399
Project	: WA_0089_PFASOMP_24	Page	: 1 of 3
Order number	: pfas-omp/Stirling	Quote number	: ES2022MWHAUS0002 (SY/139/19 B)
C-O-C number	: 64954	QC Level	: NEPM 2013 B3 & ALS QC Standard
Site	: Stirling GW - JS		
Sampler	: [redacted]		

Dates

Date Samples Received	: 13-Mar-2024 12:15	Issue Date	: 15-Mar-2024
Client Requested Due Date	: 22-Mar-2024	Scheduled Reporting Date	: **22-Mar-2024**

Delivery Details

Mode of Delivery	: Carrier	Security Seal	: Not Available
No. of coolers/boxes	: 2	Temperature	: 14.9 - Ice present
Receipt Detail	:	No. of samples received / analysed	: 15 / 15

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 see scanned COC for sample discrepencies: extra samples , samples not received etc.
- Please direct any queries related to sample condition / numbering / breakages to Sample Receipt (Samples.Perth@alsglobal.com)
- Analytical work for this work order will be conducted at ALS Environmental Perth.
- Please direct any turnaround / technical queries to the laboratory contact designated above.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months) from receipt of samples.
- **pH analysis should be conducted within 6 hours of sampling.**
- **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.**
- 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)	WATER - NT-01 & 02 Ca, Mg, Na, K, Cl, SO4, Alkalinity
EP2403218-001	12-Mar-2024 09:58	0089_MW233_240312	✓	✓
EP2403218-002	12-Mar-2024 10:15	0089_MW236_240312	✓	✓
EP2403218-003	12-Mar-2024 10:41	0089_MW243_240312	✓	✓
EP2403218-004	12-Mar-2024 10:56	0089_MW240_240312	✓	✓
EP2403218-005	12-Mar-2024 10:57	0089_QC116_240312	✓	✓
EP2403218-006	12-Mar-2024 11:08	0089_MW238_240312	✓	✓
EP2403218-007	12-Mar-2024 11:16	0089_MW239_240312	✓	✓
EP2403218-008	12-Mar-2024 11:28	0089_MW245_240312	✓	✓
EP2403218-009	12-Mar-2024 13:18	0089_MW242_240312	✓	✓
EP2403218-010	12-Mar-2024 12:00	0089_QC117_240312	✓	✓
EP2403218-011	12-Mar-2024 13:19	0089_MW288_240312	✓	✓
EP2403218-012	12-Mar-2024 14:12	0089_MW256_240312	✓	✓
EP2403218-013	12-Mar-2024 14:22	0089_MW255_240312	✓	✓
EP2403218-014	12-Mar-2024 14:38	0089_MW268_240312	✓	✓
EP2403218-015	12-Mar-2024 14:49	0089_MW269_240312	✓	✓

Proactive Holding Time Report

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

Requested Deliverables

[redacted]
- A4 - AU Tax Invoice (INV) — Email — [redacted]cardno.com.au

DERP LAB REPORTS
- *AU Certificate of Analysis - NATA (COA) — Email — derp.labreports@esdat.com.au
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI) — Email — derp.labreports@esdat.com.au
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC) — Email — derp.labreports@esdat.com.au
- A4 - AU Sample Receipt Notification - Environmental HT (SRN) — Email — derp.labreports@esdat.com.au
- Chain of Custody (CoC) (COC) — Email — derp.labreports@esdat.com.au
- EDI Format - ESDAT (ESDAT) — Email — derp.labreports@esdat.com.au
- EDI Format - XTab (XTAB) — Email — derp.labreports@esdat.com.au

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

CERTIFICATE OF ANALYSIS

Work Order	: **EP2403218**	Page	: 1 of 12
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: Customer Services EP
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: +61-8-9406 1301
Project	: WA_0089_PFASOMP_24	Date Samples Received	: 13-Mar-2024 12:15
Order number	: pfas-omp/Stirling	Date Analysis Commenced	: 15-Mar-2024
C-O-C number	: 64954	Issue Date	: 25-Mar-2024 18:57
Sampler	: [redacted] [redacted]		
Site	: Stirling GW - JS		
Quote number	: SY/139/19 B		
No. of samples received	: 15		
No. of samples analysed	: 15		

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]	Inorganics Supervisor	Perth Inorganics, Wangara, WA
[redacted]	Senior Organic Chemist	Perth Organics, Wangara, WA

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.
- As per QWI – EN55-3 Data Interpreting Procedures, Ionic balances are typically calculated using Major Anions - Chloride, Alkalinity and Sulfate; and Major Cations - Calcium, Magnesium, Potassium and Sodium. Where applicable and dependent upon sample matrix, the Ionic Balance may also include the additional contribution of Ammonia, Dissolved Metals by ICPMS and H+ to the Cations and Nitrate, SiO2 and Fluoride to the Anions.
- EP231X: High LCS and MS recoveries deemed acceptable as all associated analyte results are less than LOR.
- EP231X: LOR raised for analyte PFBS on sample "EP2403218_014" due to matrix interferences.
- Sodium Adsorption Ratio (where reported): Where results for Na, Ca or Mg are <LOR, a concentration at half the reported LOR is incorporated into the SAR calculation. This represents a conservative approach for Na relative to the assumption that <LOR = zero concentration and a conservative approach for Ca & Mg relative to the assumption that <LOR is equivalent to the LOR concentration.
- 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.
- ED045G: The presence of Thiocyanate, Thiosulfate and Sulfite can positively contribute to the chloride result, thereby may bias results higher than expected. Results should be scrutinised accordingly.

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW233_240312	0089_MW236_240312	0089_MW243_240312	0089_MW240_240312	0089_QC116_240312
				Sampling date / time	12-Mar-2024 09:58	12-Mar-2024 10:15	12-Mar-2024 10:41	12-Mar-2024 10:56	12-Mar-2024 10:57
Compound	CAS Number	LOR	Unit		EP2403218-001	EP2403218-002	EP2403218-003	EP2403218-004	EP2403218-005
					Result	Result	Result	Result	Result
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	<1	<1	<1	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	<1	<1	<1	<1
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		126	278	298	263	266
Total Alkalinity as CaCO3	----	1	mg/L		126	278	298	263	266
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		7	17	69	54	54
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		19	30	58	54	54
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		43	105	127	123	123
Magnesium	7439-95-4	1	mg/L		5	16	17	14	14
Sodium	7440-23-5	1	mg/L		17	22	41	36	36
Potassium	7440-09-7	1	mg/L		2	<1	8	3	3
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		3.20	6.75	9.03	7.90	7.96
ø Total Cations	----	0.01	meq/L		3.35	7.51	9.72	8.93	8.93
ø Ionic Balance	----	0.01	%		2.27	5.32	3.72	6.12	5.74
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		<0.02	0.24	<0.02	<0.02	<0.02
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		<0.02	0.24	<0.02	0.06	0.06
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		0.02	11.6	0.07	1.72	1.80
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		<0.02	0.41	<0.02	0.04	0.04
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		0.06	66.7	<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

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW233_240312	0089_MW236_240312	0089_MW243_240312	0089_MW240_240312	0089_QC116_240312
				Sampling date / time	12-Mar-2024 09:58	12-Mar-2024 10:15	12-Mar-2024 10:41	12-Mar-2024 10:56	12-Mar-2024 10:57
Compound	CAS Number	LOR	Unit		EP2403218-001	EP2403218-002	EP2403218-003	EP2403218-004	EP2403218-005
					Result	Result	Result	Result	Result
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	**0.14**	<0.02	<0.02	<0.02
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		<0.02	**0.64**	<0.02	**0.07**	**0.07**
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		<0.02	**0.18**	<0.02	**0.02**	**0.02**
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		<0.01	**1.29**	<0.01	**0.06**	**0.07**
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		<0.02	**2.69**	<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
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									

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW233_240312	0089_MW236_240312	0089_MW243_240312	0089_MW240_240312	0089_QC116_240312
				Sampling date / time	12-Mar-2024 09:58	12-Mar-2024 10:15	12-Mar-2024 10:41	12-Mar-2024 10:56	12-Mar-2024 10:57
Compound	CAS Number	LOR	Unit		EP2403218-001	EP2403218-002	EP2403218-003	EP2403218-004	EP2403218-005
					Result	Result	Result	Result	Result
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
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		**0.08**	**84.1**	**0.07**	**1.97**	**2.06**
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		**0.08**	**78.3**	**0.07**	**1.72**	**1.80**
Sum of PFAS (WA DER List)	----	0.01	µg/L		**0.08**	**80.8**	**0.07**	**1.87**	**1.96**
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**105**	**128**	**108**	**113**	**111**
13C8-PFOA	----	0.02	%		**115**	**114**	**119**	**114**	**108**

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW238_240312	0089_MW239_240312	0089_MW245_240312	0089_MW242_240312	0089_QC117_240312
				Sampling date / time	12-Mar-2024 11:08	12-Mar-2024 11:16	12-Mar-2024 11:28	12-Mar-2024 13:18	12-Mar-2024 12:00
Compound	CAS Number	LOR	Unit		EP2403218-006	EP2403218-007	EP2403218-008	EP2403218-009	EP2403218-010
					Result	Result	Result	Result	Result
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	<1	<1	<1	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	<1	<1	<1	<1
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		**232**	**207**	**402**	**175**	**175**
Total Alkalinity as CaCO3	----	1	mg/L		**232**	**207**	**402**	**175**	**175**
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		**67**	**52**	**6**	**24**	**24**
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		**40**	**32**	**31**	**21**	**21**
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		**100**	**91**	**136**	**68**	**67**
Magnesium	7439-95-4	1	mg/L		**18**	**11**	**16**	**11**	**11**
Sodium	7440-23-5	1	mg/L		**33**	**33**	**23**	**12**	**12**
Potassium	7440-09-7	1	mg/L		**6**	**5**	**3**	**1**	**1**
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		**7.16**	**6.12**	**9.03**	**4.59**	**4.59**
ø Total Cations	----	0.01	meq/L		**8.06**	**7.01**	**9.18**	**4.85**	**4.80**
ø Ionic Balance	----	0.01	%		**5.92**	**6.76**	**0.82**	**2.73**	**2.21**
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**	<0.01	<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	**0.02**	**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

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW238_240312	0089_MW239_240312	0089_MW245_240312	0089_MW242_240312	0089_QC117_240312
				Sampling date / time	12-Mar-2024 11:08	12-Mar-2024 11:16	12-Mar-2024 11:28	12-Mar-2024 13:18	12-Mar-2024 12:00
Compound	CAS Number	LOR	Unit		EP2403218-006	EP2403218-007	EP2403218-008	EP2403218-009	EP2403218-010
					Result	Result	Result	Result	Result
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
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									

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW238_240312	0089_MW239_240312	0089_MW245_240312	0089_MW242_240312	0089_QC117_240312
				Sampling date / time	12-Mar-2024 11:08	12-Mar-2024 11:16	12-Mar-2024 11:28	12-Mar-2024 13:18	12-Mar-2024 12:00
Compound	CAS Number	LOR	Unit		EP2403218-006	EP2403218-007	EP2403218-008	EP2403218-009	EP2403218-010
					Result	Result	Result	Result	Result
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
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**	<0.01	**0.02**	**0.01**	**0.01**
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		**0.02**	<0.01	**0.02**	**0.01**	**0.01**
Sum of PFAS (WA DER List)	----	0.01	µg/L		**0.02**	<0.01	**0.02**	**0.01**	**0.01**
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**106**	**117**	**106**	**113**	**107**
13C8-PFOA	----	0.02	%		**106**	**116**	**106**	**115**	**115**

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW288_240312	0089_MW256_240312	0089_MW255_240312	0089_MW268_240312	0089_MW269_240312
				Sampling date / time	12-Mar-2024 13:19	12-Mar-2024 14:12	12-Mar-2024 14:22	12-Mar-2024 14:38	12-Mar-2024 14:49
Compound	CAS Number	LOR	Unit		EP2403218-011	EP2403218-012	EP2403218-013	EP2403218-014	EP2403218-015
					Result	Result	Result	Result	Result
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	<1	<1	<1	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	<1	<1	<1	<1
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		322	540	271	466	460
Total Alkalinity as CaCO3	----	1	mg/L		322	540	271	466	460
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		33	86	35	570	65
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		57	495	57	1740	249
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		112	145	92	175	82
Magnesium	7439-95-4	1	mg/L		21	80	14	194	60
Sodium	7440-23-5	1	mg/L		35	235	58	964	147
Potassium	7440-09-7	1	mg/L		6	2	4	56	13
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		8.73	26.5	7.75	70.3	17.6
ø Total Cations	----	0.01	meq/L		8.99	24.1	8.37	68.1	15.8
ø Ionic Balance	----	0.01	%		1.49	4.84	3.83	1.59	5.44
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		<0.02	4.81	0.49	<0.08	0.10
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		<0.02	4.99	0.50	0.06	0.12
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		0.02	24.0	13.1	0.34	0.55
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		<0.02	0.40	0.02	<0.02	<0.02
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		0.45	7.09	0.41	<0.01	0.41
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW288_240312	0089_MW256_240312	0089_MW255_240312	0089_MW268_240312	0089_MW269_240312
				Sampling date / time	12-Mar-2024 13:19	12-Mar-2024 14:12	12-Mar-2024 14:22	12-Mar-2024 14:38	12-Mar-2024 14:49
Compound	CAS Number	LOR	Unit		EP2403218-011	EP2403218-012	EP2403218-013	EP2403218-014	EP2403218-015
					Result	Result	Result	Result	Result
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		<0.1	**1.4**	**0.2**	<0.1	<0.1
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		<0.02	**2.71**	**0.25**	<0.02	**0.04**
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		<0.02	**10.3**	**1.00**	**0.06**	**0.20**
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		<0.02	**0.92**	**0.21**	<0.02	**0.02**
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		<0.01	**0.97**	**0.06**	<0.01	**0.02**
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	**0.04**	<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
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									

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW288_240312	0089_MW256_240312	0089_MW255_240312	0089_MW268_240312	0089_MW269_240312
				Sampling date / time	12-Mar-2024 13:19	12-Mar-2024 14:12	12-Mar-2024 14:22	12-Mar-2024 14:38	12-Mar-2024 14:49
Compound	CAS Number	LOR	Unit		EP2403218-011	EP2403218-012	EP2403218-013	EP2403218-014	EP2403218-015
					Result	Result	Result	Result	Result
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
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	**0.72**	<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		**0.47**	**58.4**	**16.2**	**0.46**	**1.46**
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		**0.47**	**31.1**	**13.5**	**0.34**	**0.96**
Sum of PFAS (WA DER List)	----	0.01	µg/L		**0.47**	**52.9**	**15.7**	**0.40**	**1.34**
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**111**	**121**	**115**	**105**	**111**
13C8-PFOA	----	0.02	%		**120**	**104**	**108**	**118**	**111**

Surrogate Control Limits

Sub-Matrix: GROUNDWATER		Recovery Limits (%)	
Compound	CAS Number	Low	High
EP231S: PFAS Surrogate			
13C4-PFOS	----	65	140
13C8-PFOA	----	71	133

QUALITY CONTROL REPORT

Work Order	: **EP2403218**	Page	: 1 of 16
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: Customer Services EP
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: +61-8-9406 1301
Project	: WA_0089_PFASOMP_24	Date Samples Received	: 13-Mar-2024
Order number	: pfas-omp/Stirling	Date Analysis Commenced	: 15-Mar-2024
C-O-C number	: 64954	Issue Date	: 25-Mar-2024
Sampler	: [redacted] [redacted]		
Site	: Stirling GW - JS		
Quote number	: SY/139/19 B		
No. of samples received	: 15		
No. of samples analysed	: 15		

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]	Inorganics Supervisor	Perth Inorganics, Wangara, WA
[redacted]	Senior Organic Chemist	Perth Organics, Wangara, WA

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 (%)
ED037P: Alkalinity by PC Titrator (QC Lot: 5671371)									
EP2403216-002	Anonymous	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	1030	1030	0.0	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	1030	1030	0.0	0% - 20%
EP2403218-005	0089_QC116_240312	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	266	264	0.6	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	266	264	0.6	0% - 20%
ED037P: Alkalinity by PC Titrator (QC Lot: 5671373)									
EP2403218-015	0089_MW269_240312	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	460	460	0.0	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	460	460	0.0	0% - 20%
EP2403380-002	Anonymous	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	232	233	0.0	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	232	233	0.0	0% - 20%
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QC Lot: 5666010)									
EP2403218-001	0089_MW233_240312	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	7	7	0.0	No Limit
EP2403218-011	0089_MW288_240312	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	33	34	0.0	0% - 20%

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 (%)
ED045G: Chloride by Discrete Analyser (QC Lot: 5666011)									
EP2403218-001	0089_MW233_240312	ED045G: Chloride	16887-00-6	1	mg/L	19	18	7.4	0% - 50%
EP2403218-011	0089_MW288_240312	ED045G: Chloride	16887-00-6	1	mg/L	57	57	0.0	0% - 20%
ED093F: Dissolved Major Cations (QC Lot: 5666285)									
EP2403216-001	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	105	105	0.0	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	25	25	0.0	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	128	128	0.0	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	6	6	0.0	No Limit
EP2403218-005	0089_QC116_240312	ED093F: Calcium	7440-70-2	1	mg/L	123	124	1.1	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	14	14	0.0	0% - 50%
		ED093F: Sodium	7440-23-5	1	mg/L	36	36	0.0	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	3	3	0.0	No Limit
ED093F: Dissolved Major Cations (QC Lot: 5666286)									
EP2403218-015	0089_MW269_240312	ED093F: Calcium	7440-70-2	1	mg/L	82	83	0.0	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	60	61	0.0	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	147	148	0.0	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	13	13	0.0	0% - 50%
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 5669248)									
EP2403216-002	Anonymous	EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01 (0.04)*	µg/L	11.5	10.6	8.3	0% - 20%
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	3.50	3.51	0.0	0% - 20%
		EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	0.78	0.81	3.4	0% - 20%
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	1.45	1.38	5.1	0% - 20%
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	0.84	0.78	7.8	0% - 20%
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
EP2403218-006	0089_MW238_240312	EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	0.02	0.02	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: 5669267)									
EP2403218-014	0089_MW268_240312	EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	0.34	0.32	7.1	0% - 20%
		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	<0.08	0.07	17.2	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	0.06	0.06	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
EP2403299-001	Anonymous	EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	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 (%)*
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 5669267) - continued									
EP2403299-001	Anonymous	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: 5669341)									
EP2403218-002	0089_MW236_240312	EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01 (0.41)*	µg/L	11.6	11.5	0.9	0% - 20%
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01 (0.41)*	µg/L	66.7	60.0	10.5	0% - 20%
		EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	0.24	0.24	0.0	0% - 50%
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	0.24	0.23	0.0	0% - 50%
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	0.41	0.39	5.4	0% - 20%
		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: 5669248)									
EP2403216-002	Anonymous	EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	0.85	0.86	0.0	0% - 20%
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	0.34	0.35	3.5	0% - 50%
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	1.62	1.60	1.7	0% - 20%
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	0.26	0.24	7.6	0% - 50%
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	0.04	0.04	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	0.3	0.3	0.0	No Limit
EP2403218-006	0089_MW238_240312	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: 5669267)									
EP2403218-014	0089_MW268_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: 5669267) - continued									
EP2403218-014	0089_MW268_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	0.06	0.05	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
EP2403299-001	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
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 5669341)									
EP2403218-002	0089_MW236_240312	EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	1.29	1.30	0.0	0% - 20%
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	0.14	0.14	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	0.64	0.63	1.9	0% - 20%
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	0.18	0.17	6.1	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	2.69	2.59	3.8	0% - 20%
		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: 5669248)									
EP2403216-002	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

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: 5669248) - continued									
EP2403216-002	Anonymous	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
EP2403218-006	0089_MW238_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: 5669267)									
EP2403218-014	0089_MW268_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
EP2403299-001	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

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: 5669267) - continued									
EP2403299-001	Anonymous	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: 5669341)									
EP2403218-002	0089_MW236_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
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 5669248)									
EP2403216-002	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
EP2403218-006	0089_MW238_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

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: 5669267)									
EP2403218-014	0089_MW268_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
EP2403299-001	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
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 5669341)									
EP2403218-002	0089_MW236_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
EP231P: PFAS Sums (QC Lot: 5669248)									
EP2403216-002	Anonymous	EP231X: Sum of PFAS	----	0.01	µg/L	21.5	20.5	4.8	0% - 20%
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01 (0.04)*	µg/L	15.0	14.1	6.1	0% - 20%
		EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	19.2	18.3	4.7	0% - 20%
EP2403218-006	0089_MW238_240312	EP231X: Sum of PFAS	----	0.01	µg/L	0.02	0.02	0.0	No Limit
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	0.02	0.02	0.0	No Limit
		EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	0.02	0.02	0.0	No Limit
EP231P: PFAS Sums (QC Lot: 5669267)									
EP2403218-014	0089_MW268_240312	EP231X: Sum of PFAS	----	0.01	µg/L	0.46	0.50	8.3	0% - 20%
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	0.34	0.32	6.1	0% - 20%
		EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	0.40	0.44	9.5	0% - 20%
EP2403299-001	Anonymous	EP231X: Sum of PFAS	----	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 (%)*
EP231P: PFAS Sums (QC Lot: 5669267) - continued									
EP2403299-001	Anonymous	EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	<0.01	<0.01	0.0	No Limit
EP231P: PFAS Sums (QC Lot: 5669341)									
EP2403218-002	0089_MW236_240312	EP231X: Sum of PFAS	----	0.01 (0.41)*	µg/L	84.1	77.2	8.6	0% - 20%
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01 (0.41)*	µg/L	78.3	71.5	9.1	0% - 20%
		EP231X: Sum of PFAS (WA DER List)	----	0.01 (0.41)*	µg/L	80.8	74.0	8.8	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
ED037P: Alkalinity by PC Titrator (QCLot: 5671371)								
ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	----	----	----	----
ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	----	----	----	----
ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	<1	----	----	----	----
ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	<1	20 mg/L	95.6	85.1	126
				<1	200 mg/L	101	90.5	111
ED037P: Alkalinity by PC Titrator (QCLot: 5671373)								
ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	----	----	----	----
ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	----	----	----	----
ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	<1	----	----	----	----
ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	<1	20 mg/L	96.6	85.1	126
				<1	200 mg/L	102	90.5	111
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 5666010)								
ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<1	25 mg/L	97.7	89.9	112
				<1	500 mg/L	95.9	89.9	112
ED045G: Chloride by Discrete Analyser (QCLot: 5666011)								
ED045G: Chloride	16887-00-6	1	mg/L	<1	10 mg/L	93.7	88.6	113
				<1	1000 mg/L	98.2	88.6	113
ED093F: Dissolved Major Cations (QCLot: 5666285)								
ED093F: Calcium	7440-70-2	1	mg/L	<1	50 mg/L	101	86.5	117
ED093F: Magnesium	7439-95-4	1	mg/L	<1	50 mg/L	100	88.4	110
ED093F: Sodium	7440-23-5	1	mg/L	<1	50 mg/L	99.2	91.4	113
ED093F: Potassium	7440-09-7	1	mg/L	<1	50 mg/L	96.2	84.6	108
ED093F: Dissolved Major Cations (QCLot: 5666286)								
ED093F: Calcium	7440-70-2	1	mg/L	<1	50 mg/L	102	86.5	117
ED093F: Magnesium	7439-95-4	1	mg/L	<1	50 mg/L	101	88.4	110
ED093F: Sodium	7440-23-5	1	mg/L	<1	50 mg/L	100	91.4	113
ED093F: Potassium	7440-09-7	1	mg/L	<1	50 mg/L	96.4	84.6	108
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5669248)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.2218 µg/L	90.6	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
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5669248) - continued								
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.2352 µg/L	89.5	71.0	127
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	0.2373 µg/L	90.4	68.0	131
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.238 µg/L	86.3	69.0	134
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.232 µg/L	89.4	65.0	140
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.241 µg/L	95.2	53.0	142
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5669267)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.2218 µg/L	102	72.0	130
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.2352 µg/L	93.3	71.0	127
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	0.2373 µg/L	95.4	68.0	131
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.238 µg/L	88.2	69.0	134
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.232 µg/L	97.0	65.0	140
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.241 µg/L	84.0	53.0	142
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5669341)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.2218 µg/L	94.4	72.0	130
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.2352 µg/L	91.6	71.0	127
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	0.2373 µg/L	93.8	68.0	131
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.238 µg/L	87.0	69.0	134
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.232 µg/L	102	65.0	140
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.241 µg/L	91.1	53.0	142
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5669248)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	1.25 µg/L	109	73.0	129
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	0.25 µg/L	100	72.0	129
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	0.25 µg/L	93.6	72.0	129
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	0.25 µg/L	94.2	72.0	130
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	0.25 µg/L	99.6	71.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	0.25 µg/L	103	69.0	130
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	0.25 µg/L	99.2	71.0	129
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	0.25 µg/L	119	69.0	133
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	0.25 µg/L	90.6	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	0.25 µg/L	114	71.0	132
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5669267)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	1.25 µg/L	93.8	73.0	129
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	0.25 µg/L	101	72.0	129

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: 5669267) - continued								
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	96.2	72.0	130
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	0.25 µg/L	104	71.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	0.25 µg/L	100	69.0	130
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	0.25 µg/L	106	71.0	129
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	0.25 µg/L	113	69.0	133
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	0.25 µg/L	110	72.0	134
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	0.25 µg/L	108	65.0	144
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	0.25 µg/L	105	71.0	132
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5669341)								
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	93.6	72.0	129
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	0.25 µg/L	103	72.0	129
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	0.25 µg/L	96.8	72.0	130
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	0.25 µg/L	99.2	71.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	0.25 µg/L	109	69.0	130
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	0.25 µg/L	91.0	71.0	129
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	0.25 µg/L	102	69.0	133
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	0.25 µg/L	84.8	72.0	134
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	0.25 µg/L	89.8	65.0	144
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	0.25 µg/L	121	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5669248)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.25 µg/L	115	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	0.625 µg/L	105	68.0	141
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	0.625 µg/L	119	60.5	138
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	0.625 µg/L	94.6	68.3	134
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	0.625 µg/L	102	62.2	138
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	0.25 µg/L	103	65.0	136
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	0.25 µg/L	86.4	61.0	135
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5669267)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.25 µg/L	104	67.0	137

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
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5669267) - continued								
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	0.625 µg/L	96.8	68.0	141
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	0.625 µg/L	# 142	60.5	138
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	0.625 µg/L	100	68.3	134
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	0.625 µg/L	95.6	62.2	138
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	0.25 µg/L	114	65.0	136
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	0.25 µg/L	103	61.0	135
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5669341)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.25 µg/L	108	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	0.625 µg/L	94.6	68.0	141
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	0.625 µg/L	91.2	60.5	138
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	0.625 µg/L	106	68.3	134
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	0.625 µg/L	99.3	62.2	138
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	0.25 µg/L	96.8	65.0	136
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	0.25 µg/L	67.4	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5669248)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.2343 µg/L	122	63.0	143
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	0.2378 µg/L	112	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	0.24 µg/L	114	67.0	138
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	0.241 µg/L	112	64.2	133
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5669267)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.2343 µg/L	103	63.0	143
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	0.2378 µg/L	104	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	0.24 µg/L	104	67.0	138
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	0.241 µg/L	81.7	64.2	133
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5669341)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.2343 µg/L	108	63.0	143
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	0.2378 µg/L	111	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	0.24 µg/L	110	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: 5669341) - continued								
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	0.241 µg/L	89.2	64.2	133
EP231P: PFAS Sums (QCLot: 5669248)								
EP231X: Sum of PFAS	----	0.01	µg/L	<0.01	----	----	----	----
EP231X: Sum of PFHxS and PFOS	355-46-4/17 63-23-1	0.01	µg/L	<0.01	----	----	----	----
EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	<0.01	----	----	----	----
EP231P: PFAS Sums (QCLot: 5669267)								
EP231X: Sum of PFAS	----	0.01	µg/L	<0.01	----	----	----	----
EP231X: Sum of PFHxS and PFOS	355-46-4/17 63-23-1	0.01	µg/L	<0.01	----	----	----	----
EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	<0.01	----	----	----	----
EP231P: PFAS Sums (QCLot: 5669341)								
EP231X: Sum of PFAS	----	0.01	µg/L	<0.01	----	----	----	----
EP231X: Sum of PFHxS and PFOS	355-46-4/17 63-23-1	0.01	µg/L	<0.01	----	----	----	----
EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	<0.01	----	----	----	----

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
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 5666010)							
EP2403218-001	0089_MW233_240312	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	100 mg/L	93.7	70.4	130
ED045G: Chloride by Discrete Analyser (QCLot: 5666011)							
EP2403218-001	0089_MW233_240312	ED045G: Chloride	16887-00-6	200 mg/L	117	70.0	130
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5669248)							
EP2403218-001	0089_MW233_240312	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.2218 µg/L	95.9	72.0	129
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.232 µg/L	103	71.0	127
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.2352 µg/L	90.7	68.0	129
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.238 µg/L	92.4	69.0	134
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.232 µg/L	91.0	65.0	140
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.241 µg/L	87.4	53.0	129
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5669267)							

Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5669267) - continued							
EP2403218-015	0089_MW269_240312	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.2218 µg/L	89.4	72.0	129
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.232 µg/L	103	71.0	127
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.2352 µg/L	110	68.0	129
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.238 µg/L	93.6	69.0	134
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.232 µg/L	125	65.0	140
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.241 µg/L	103	53.0	129
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5669248)							
EP2403218-001	0089_MW233_240312	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	1.25 µg/L	131	73.0	142
		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	87.7	72.0	129
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.25 µg/L	97.3	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	106	69.0	130
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.25 µg/L	103	71.0	134
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.25 µg/L	109	69.0	133
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.25 µg/L	97.9	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	0.25 µg/L	97.2	71.0	132
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5669267)							
EP2403218-015	0089_MW269_240312	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	1.25 µg/L	97.9	73.0	142
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.25 µg/L	122	72.0	129
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.25 µg/L	99.7	72.0	129
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.25 µg/L	87.3	72.0	130
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.25 µg/L	104	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	118	71.0	134
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.25 µg/L	116	69.0	133
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.25 µg/L	127	72.0	134
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.25 µg/L	114	65.0	144
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.25 µg/L	97.8	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5669248)							
EP2403218-001	0089_MW233_240312	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.25 µg/L	120	59.0	135
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.625 µg/L	111	70.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.625 µg/L	124	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.625 µg/L	99.6	70.0	130

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: 5669248) - continued							
EP2403218-001	0089_MW233_240312	EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.625 µg/L	98.3	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.25 µg/L	104	65.0	136
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.25 µg/L	104	61.0	135
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5669267)							
EP2403218-015	0089_MW269_240312	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.25 µg/L	101	59.0	135
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.625 µg/L	114	70.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.625 µg/L	# 174	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.625 µg/L	100	70.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.625 µg/L	91.2	70.0	130
		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	114	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5669248)							
EP2403218-001	0089_MW233_240312	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.234 µg/L	112	63.0	143
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.2378 µg/L	109	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.24 µg/L	105	67.0	138
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.2415 µg/L	94.9	70.0	130
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5669267)							
EP2403218-015	0089_MW269_240312	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.234 µg/L	109	63.0	143
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.2378 µg/L	103	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.24 µg/L	105	67.0	138
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.2415 µg/L	89.1	70.0	130

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **EP2403218**	Page	: 1 of 6
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Telephone	: +61-8-9406 1301
Project	: WA_0089_PFASOMP_24	Date Samples Received	: 13-Mar-2024
Site	: Stirling GW - JS	Issue Date	: 25-Mar-2024
Sampler	: [redacted]	No. of samples received	: 15
Order number	: pfas-omp/Stirling	No. of samples analysed	: 15

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.**
- **Laboratory Control outliers exist - please see following pages for full details.**
- **Matrix Spike outliers exist - please see following pages for full details.**
- **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.**

Outliers : Quality Control Samples

Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

Matrix: **WATER**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
Laboratory Control Spike (LCS) Recoveries							
EP231C: Perfluoroalkyl Sulfonamides	QC-5669267-002	----	**N-Ethyl perfluorooctane sulfonamide (EtFOSA)**	4151-50-2	142 %	60.5-138%	**Recovery greater than upper control limit**
Matrix Spike (MS) Recoveries							
EP231C: Perfluoroalkyl Sulfonamides	EP2403218--015	0089_MW269_240312	**N-Ethyl perfluorooctane sulfonamide (EtFOSA)**	4151-50-2	174 %	70.0-130%	**Recovery greater than upper data quality objective**

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
ED037P: Alkalinity by PC Titrator							
Clear Plastic Bottle - Natural (ED037-P)							
0089_MW233_240312, 0089_MW236_240312, 0089_MW243_240312, 0089_MW240_240312, 0089_QC116_240312, 0089_MW238_240312, 0089_MW239_240312, 0089_MW245_240312, 0089_MW242_240312, 0089_QC117_240312, 0089_MW288_240312, 0089_MW256_240312, 0089_MW255_240312, 0089_MW268_240312, 0089_MW269_240312	**12-Mar-2024**	**----**	----	----	**19-Mar-2024**	26-Mar-2024	✓
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA							
Clear Plastic Bottle - Natural (ED041G)							
0089_MW233_240312, 0089_MW236_240312, 0089_MW243_240312, 0089_MW240_240312, 0089_QC116_240312, 0089_MW238_240312, 0089_MW239_240312, 0089_MW245_240312, 0089_MW242_240312, 0089_QC117_240312, 0089_MW288_240312, 0089_MW256_240312, 0089_MW255_240312, 0089_MW268_240312, 0089_MW269_240312	**12-Mar-2024**	**----**	----	----	**25-Mar-2024**	09-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
ED045G: Chloride by Discrete Analyser							
Clear Plastic Bottle - Natural (ED045G)							
0089_MW233_240312, 0089_MW236_240312, 0089_MW243_240312, 0089_MW240_240312, 0089_QC116_240312, 0089_MW238_240312, 0089_MW239_240312, 0089_MW245_240312, 0089_MW242_240312, 0089_QC117_240312, 0089_MW288_240312, 0089_MW256_240312, 0089_MW255_240312, 0089_MW268_240312, 0089_MW269_240312	**12-Mar-2024**	**----**	----	----	**25-Mar-2024**	09-Apr-2024	✓
ED093F: Dissolved Major Cations							
Clear Plastic Bottle - Natural (ED093F)							
0089_MW233_240312, 0089_MW236_240312, 0089_MW243_240312, 0089_MW240_240312, 0089_QC116_240312, 0089_MW238_240312, 0089_MW239_240312, 0089_MW245_240312, 0089_MW242_240312, 0089_QC117_240312, 0089_MW288_240312, 0089_MW256_240312, 0089_MW255_240312, 0089_MW268_240312, 0089_MW269_240312	**12-Mar-2024**	**----**	----	----	**19-Mar-2024**	19-Mar-2024	✓
EP231A: Perfluoroalkyl Sulfonic Acids							
HDPE (no PTFE) (EP231X)							
0089_MW236_240312, 0089_MW242_240312, 0089_QC117_240312, 0089_MW288_240312, 0089_MW256_240312, 0089_MW255_240312, 0089_MW268_240312, 0089_MW269_240312	**12-Mar-2024**	**18-Mar-2024**	08-Sep-2024	✓	**18-Mar-2024**	08-Sep-2024	✓
HDPE (no PTFE) (EP231X)							
0089_MW233_240312, 0089_MW243_240312, 0089_MW240_240312, 0089_QC116_240312, 0089_MW238_240312, 0089_MW239_240312, 0089_MW245_240312	**12-Mar-2024**	**18-Mar-2024**	08-Sep-2024	✓	**19-Mar-2024**	08-Sep-2024	✓
EP231B: Perfluoroalkyl Carboxylic Acids							
HDPE (no PTFE) (EP231X)							
0089_MW236_240312, 0089_MW242_240312, 0089_QC117_240312, 0089_MW288_240312, 0089_MW256_240312, 0089_MW255_240312, 0089_MW268_240312, 0089_MW269_240312	**12-Mar-2024**	**18-Mar-2024**	08-Sep-2024	✓	**18-Mar-2024**	08-Sep-2024	✓
HDPE (no PTFE) (EP231X)							
0089_MW233_240312, 0089_MW243_240312, 0089_MW240_240312, 0089_QC116_240312, 0089_MW238_240312, 0089_MW239_240312, 0089_MW245_240312	**12-Mar-2024**	**18-Mar-2024**	08-Sep-2024	✓	**19-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) 0089_MW236_240312, 0089_MW242_240312, 0089_QC117_240312, 0089_MW288_240312, 0089_MW256_240312, 0089_MW255_240312, 0089_MW268_240312, 0089_MW269_240312	**12-Mar-2024**	**18-Mar-2024**	08-Sep-2024	✓	**18-Mar-2024**	08-Sep-2024	✓
HDPE (no PTFE) (EP231X) 0089_MW233_240312, 0089_MW243_240312, 0089_MW240_240312, 0089_QC116_240312, 0089_MW238_240312, 0089_MW239_240312, 0089_MW245_240312	**12-Mar-2024**	**18-Mar-2024**	08-Sep-2024	✓	**19-Mar-2024**	08-Sep-2024	✓
EP231D: (n:2) Fluorotelomer Sulfonic Acids							
HDPE (no PTFE) (EP231X) 0089_MW236_240312, 0089_MW242_240312, 0089_QC117_240312, 0089_MW288_240312, 0089_MW256_240312, 0089_MW255_240312, 0089_MW268_240312, 0089_MW269_240312	**12-Mar-2024**	**18-Mar-2024**	08-Sep-2024	✓	**18-Mar-2024**	08-Sep-2024	✓
HDPE (no PTFE) (EP231X) 0089_MW233_240312, 0089_MW243_240312, 0089_MW240_240312, 0089_QC116_240312, 0089_MW238_240312, 0089_MW239_240312, 0089_MW245_240312	**12-Mar-2024**	**18-Mar-2024**	08-Sep-2024	✓	**19-Mar-2024**	08-Sep-2024	✓
EP231P: PFAS Sums							
HDPE (no PTFE) (EP231X) 0089_MW236_240312, 0089_MW242_240312, 0089_QC117_240312, 0089_MW288_240312, 0089_MW256_240312, 0089_MW255_240312, 0089_MW268_240312, 0089_MW269_240312	**12-Mar-2024**	**18-Mar-2024**	08-Sep-2024	✓	**18-Mar-2024**	08-Sep-2024	✓
HDPE (no PTFE) (EP231X) 0089_MW233_240312, 0089_MW243_240312, 0089_MW240_240312, 0089_QC116_240312, 0089_MW238_240312, 0089_MW239_240312, 0089_MW245_240312	**12-Mar-2024**	**18-Mar-2024**	08-Sep-2024	✓	**19-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)							
Alkalinity by Auto Titrator	ED037-P	4	40	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	15	**13.33**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	3	24	**12.50**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	5	40	**12.50**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	19	**10.53**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Alkalinity by Auto Titrator	ED037-P	4	40	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	15	**13.33**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	2	24	**8.33**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	3	40	**7.50**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	19	**10.53**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Alkalinity by Auto Titrator	ED037-P	2	40	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	1	15	**6.67**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	2	24	**8.33**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	3	40	**7.50**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	19	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Chloride by Discrete Analyser	ED045G	1	15	**6.67**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	40	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	19	**5.26**	**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
Alkalinity by Auto Titrator	ED037-P	WATER	In house: Referenced to APHA 2320 B This procedure determines alkalinity by automated measurement (e.g. PC Titrate) on a settled supernatant aliquot of the sample using pH 4.5 for indicating the total alkalinity end-point. This method is compliant with NEPM Schedule B(3)
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	WATER	In house: Referenced to APHA 4500-SO4. Dissolved sulfate is determined in a 0.45um filtered sample. Sulfate ions are converted to a barium sulfate suspension in an acetic acid medium with barium chloride. Light absorbance of the BaSO4 suspension is measured by a photometer and the SO4-2 concentration is determined by comparison of the reading with a standard curve. This method is compliant with NEPM Schedule B(3)
Chloride by Discrete Analyser	ED045G	WATER	In house: Referenced to APHA 4500 Cl - G.The thiocyanate ion is liberated from mercuric thiocyanate through sequestration of mercury by the chloride ion to form non-ionised mercuric chloride. In the presence of ferric ions the liberated thiocynate forms highly-coloured ferric thiocynate which is measured at 480 nm.
Major Cations - Dissolved	ED093F	WATER	In house: Referenced to APHA 3120 and 3125; USEPA SW 846 - 6010 and 6020; Cations are determined by either ICP-AES or ICP-MS techniques. This method is compliant with NEPM Schedule B(3) Sodium Adsorption Ratio is calculated from Ca, Mg and Na which determined by ALS in house method QWI-EN/ED093F. This method is compliant with NEPM Schedule B(3) Hardness parameters are calculated based on APHA 2340 B. This method is compliant with NEPM Schedule B(3)
Ionic Balance by PCT DA and Turbi SO4 DA	* EN055 - PG	WATER	In house: Referenced to APHA 1030F. This method is compliant with NEPM Schedule B(3)
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.

ALSCompass
SAMPLING *Intelligence*

ALS

Environmental Division
Perth
Work Order Reference
EP2403219

Telephone +61-8-9406 1301

Custody Document for Submissions via ALS Compass App

Project: WA_0089_PFASOMP_24 **Client:** Stantec

Project Manager: [redacted]
Phone:

ALS Compass COC Reference: 64954; 64944; 64940; 64939; 64941; 64967; 64969 **# Samples:**

Sampler: [redacted]
Phone:

Turnaround Requirements: Standard Urgent

Special Instructions:

Custody:

Relinquished by: [redacted]	Received by: [redacted]	Relinquished by:	Received by:
Date / Time: 12/3/24 - 3:09pm	Date / Time: 13/3 1215	Date / Time:	Date / Time:

CHAIN OF CUSTODY

COC#: 64983 *ALS Laboratory:* EP Perth Environmental

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP_24

SITE: Stirling SW/PW - JS

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO [redacted]

EMAIL INVOICES TO [redacted]

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

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	WA OMP Water Suite WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
001	0089_SW372		12/03/2024 01:15 PM	WATER	ALS: 5 Non ALS: 0	No	X		
002	0089_SW373		12/03/2024 01:16 PM	WATER	ALS: 5 Non ALS: 0	No	X		
003	0089_PW346		12/03/2024 01:17 PM	WATER	ALS: 3 Non ALS: 0	No	X		

CHAIN OF CUSTODY

COC#: 64983 ALS Laboratory: EP Perth Environmental

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

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP_24

SITE: Stirling SW/PW - JS

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES 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	0089_SW372	HDPE (no PTFE)	20 mL	00350822058963	Grey	No	
001	0089_SW372	HDPE (no PTFE)	20 mL	00350822058811	Grey	No	
001	0089_SW372	HDPE (no PTFE)	20 mL	00352309050541	Grey	No	
001	0089_SW372	HDPE (no PTFE)	20 mL	00352309050429	Grey	No	
001	0089_SW372	Clear Plastic Bottle - Natural	125 mL	00070821217558	Green	No	
002	0089_SW373	Clear Plastic Bottle - Natural	125 mL	00070821217564	Green	No	
002	0089_SW373	HDPE (no PTFE)	20 mL	00352309050539	Grey	No	
002	0089_SW373	HDPE (no PTFE)	20 mL	00352309050479	Grey	No	
002	0089_SW373	HDPE (no PTFE)	20 mL	00350822058970	Grey	No	
002	0089_SW373	HDPE (no PTFE)	20 mL	00350822058887	Grey	No	
003	0089_PW346	Clear Plastic Bottle - Natural	125 mL	00070821217577	Green	No	
003	0089_PW346	HDPE (no PTFE)	20 mL	00352309065966	Grey	No	
003	0089_PW346	HDPE (no PTFE)	20 mL	00352309065976	Grey	No	

Total Bottle Count: ALS: 13, Non ALS: 0

SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : **EP2403219**

Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: Customer Services EP
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
E-mail	: [redacted]stantec.com	E-mail	: ALSEnviro.Perth@alsglobal.com
Telephone	: ----	Telephone	: +61-8-9406 1301
Facsimile	: ----	Facsimile	: +61-8-9406 1399
Project	: WA_0089_PFASOMP_24	Page	: 1 of 2
Order number	: pfas-omp/Stirling	Quote number	: ES2022MWHAUS0002 (SY/139/19 B)
C-O-C number	: 64983	QC Level	: NEPM 2013 B3 & ALS QC Standard
Site	: Stirling SW/PW - JS		
Sampler	: [redacted]		

Dates

Date Samples Received	: 13-Mar-2024 12:15	Issue Date	: 15-Mar-2024
Client Requested Due Date	: 22-Mar-2024	Scheduled Reporting Date	: **22-Mar-2024**

Delivery Details

Mode of Delivery	: Carrier	Security Seal	: Not Available
No. of coolers/boxes	: 2	Temperature	: 14.9 - Ice present
Receipt Detail	:	No. of samples received / analysed	: 3 / 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 see scanned COC for sample discrepencies: extra samples , samples not received etc.
- Please direct any queries related to sample condition / numbering / breakages to Sample Receipt (Samples.Perth@alsglobal.com)
- Analytical work for this work order will be conducted at ALS Environmental Perth.
- Please direct any turnaround / technical queries to the laboratory contact designated above.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months) from receipt of samples.
- **pH analysis should be conducted within 6 hours of sampling.**
- **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.**
- 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)	WATER - NT-01 & 02 Ca, Mg, Na, K, Cl, SO4, Alkalinity
EP2403219-001	12-Mar-2024 13:15	0089_SW372_240312	✓	✓
EP2403219-002	12-Mar-2024 13:16	0089_SW373_240312	✓	✓
EP2403219-003	12-Mar-2024 13:17	0089_PW346_240312	✓	✓

Proactive Holding Time Report

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

Requested Deliverables

[redacted]
- A4 - AU Tax Invoice (INV) — Email — [redacted]cardno.com.au

DERP LAB REPORTS
- *AU Certificate of Analysis - NATA (COA) — Email — derp.labreports@esdat.com.au
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI) — Email — derp.labreports@esdat.com.au
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC) — Email — derp.labreports@esdat.com.au
- A4 - AU Sample Receipt Notification - Environmental HT (SRN) — Email — derp.labreports@esdat.com.au
- Chain of Custody (CoC) (COC) — Email — derp.labreports@esdat.com.au
- EDI Format - ESDAT (ESDAT) — Email — derp.labreports@esdat.com.au
- EDI Format - XTab (XTAB) — Email — derp.labreports@esdat.com.au

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

CERTIFICATE OF ANALYSIS

Work Order	: **EP2403219**	Page	: 1 of 6
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: Customer Services EP
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: +61-8-9406 1301
Project	: WA_0089_PFASOMP_24	Date Samples Received	: 13-Mar-2024 12:15
Order number	: pfas-omp/Stirling	Date Analysis Commenced	: 15-Mar-2024
C-O-C number	: 64983	Issue Date	: 25-Mar-2024 14:01
Sampler	: [redacted] [redacted]		
Site	: Stirling SW/PW - JS		
Quote number	: SY/139/19 B		
No. of samples received	: 3		
No. of samples analysed	: 3		

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]	Inorganics Supervisor	Perth Inorganics, Wangara, WA
[redacted]	Senior Organic Chemist	Perth Organics, Wangara, WA

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.
- As per QWI – EN55-3 Data Interpreting Procedures, Ionic balances are typically calculated using Major Anions - Chloride, Alkalinity and Sulfate; and Major Cations - Calcium, Magnesium, Potassium and Sodium. Where applicable and dependent upon sample matrix, the Ionic Balance may also include the additional contribution of Ammonia, Dissolved Metals by ICPMS and H+ to the Cations and Nitrate, SiO2 and Fluoride to the Anions.
- EP231X: High LCS and MS recoveries deemed acceptable as all associated analyte results are less than LOR.
- EP231X: LOR raised for analyte PFHpA on sample "EP2403219_001" due to matrix interferences.
- Sodium Adsorption Ratio (where reported): Where results for Na, Ca or Mg are <LOR, a concentration at half the reported LOR is incorporated into the SAR calculation. This represents a conservative approach for Na relative to the assumption that <LOR = zero concentration and a conservative approach for Ca & Mg relative to the assumption that <LOR is equivalent to the LOR concentration.
- 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.
- ED045G: The presence of Thiocyanate, Thiosulfate and Sulfite can positively contribute to the chloride result, thereby may bias results higher than expected. Results should be scrutinised accordingly.

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_SW372_240312	0089_SW373_240312	0089_PW346_240312	----	----
				Sampling date / time	12-Mar-2024 13:15	12-Mar-2024 13:16	12-Mar-2024 13:17	----	----
Compound	CAS Number	LOR	Unit		EP2403219-001	EP2403219-002	EP2403219-003	--------	--------
					Result	Result	Result	----	----
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	<1	<1	----	----
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	<1	<1	----	----
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		**153**	**136**	**372**	----	----
Total Alkalinity as CaCO3	----	1	mg/L		**153**	**136**	**372**	----	----
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		**2450**	**2620**	**2220**	----	----
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		**17600**	**18200**	**15000**	----	----
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		**475**	**474**	**436**	----	----
Magnesium	7439-95-4	1	mg/L		**1510**	**1480**	**1260**	----	----
Sodium	7440-23-5	1	mg/L		**10400**	**10200**	**8470**	----	----
Potassium	7440-09-7	1	mg/L		**612**	**597**	**499**	----	----
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		**550**	**571**	**477**	----	----
ø Total Cations	----	0.01	meq/L		**616**	**604**	**507**	----	----
ø Ionic Balance	----	0.01	%		**5.61**	**2.87**	**3.04**	----	----
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		**0.03**	<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		**0.18**	**0.17**	**0.14**	----	----
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	<0.02	<0.02	----	----

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_SW372_240312	0089_SW373_240312	0089_PW346_240312	----	----
				Sampling date / time	12-Mar-2024 13:15	12-Mar-2024 13:16	12-Mar-2024 13:17	----	----
Compound	CAS Number	LOR	Unit		EP2403219-001	EP2403219-002	EP2403219-003	--------	--------
					Result	Result	Result	----	----
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		<0.04	<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	----	----
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									

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_SW372_240312	0089_SW373_240312	0089_PW346_240312	----	----
				Sampling date / time	12-Mar-2024 13:15	12-Mar-2024 13:16	12-Mar-2024 13:17	----	----
Compound	CAS Number	LOR	Unit		EP2403219-001	EP2403219-002	EP2403219-003	--------	--------
					Result	Result	Result	----	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
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		**0.21**	**0.17**	**0.15**	----	----
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		**0.21**	**0.17**	**0.15**	----	----
Sum of PFAS (WA DER List)	----	0.01	µg/L		**0.21**	**0.17**	**0.15**	----	----
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**116**	**119**	**108**	----	----
13C8-PFOA	----	0.02	%		**105**	**106**	**107**	----	----

Surrogate Control Limits

Sub-Matrix: SURFACE WATER		Recovery Limits (%)	
Compound	CAS Number	Low	High
EP231S: PFAS Surrogate			
13C4-PFOS	----	65	140
13C8-PFOA	----	71	133

QUALITY CONTROL REPORT

Work Order	: **EP2403219**	Page	: 1 of 9
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: Customer Services EP
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: +61-8-9406 1301
Project	: WA_0089_PFASOMP_24	Date Samples Received	: 13-Mar-2024
Order number	: pfas-omp/Stirling	Date Analysis Commenced	: 15-Mar-2024
C-O-C number	: 64983	Issue Date	: 25-Mar-2024
Sampler	: [redacted] [redacted]		
Site	: Stirling SW/PW - JS		
Quote number	: SY/139/19 B		
No. of samples received	: 3		
No. of samples analysed	: 3		

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]	Inorganics Supervisor	Perth Inorganics, Wangara, WA
[redacted]	Senior Organic Chemist	Perth Organics, Wangara, WA

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 (%)
ED037P: Alkalinity by PC Titrator (QC Lot: 5671373)									
EP2403218-015	Anonymous	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	460	460	0.0	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	460	460	0.0	0% - 20%
EP2403380-002	Anonymous	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	232	233	0.0	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	232	233	0.0	0% - 20%
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QC Lot: 5665951)									
EP2403219-001	0089_SW372_240312	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	2450	2480	1.3	0% - 20%
EP2403224-008	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	2720	2720	0.0	0% - 20%
ED045G: Chloride by Discrete Analyser (QC Lot: 5665952)									
EP2403219-001	0089_SW372_240312	ED045G: Chloride	16887-00-6	1	mg/L	17600	17200	2.1	0% - 20%
EP2403224-008	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	21000	20800	1.3	0% - 20%
ED093F: Dissolved Major Cations (QC Lot: 5666286)									
EP2403218-015	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	82	83	0.0	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	60	61	0.0	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	147	148	0.0	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	13	13	0.0	0% - 50%
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 5669267)									
EP2403218-014	Anonymous	EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	0.34	0.32	7.1	0% - 20%
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	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 (%)*
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 5669267) - continued									
EP2403218-014	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.08	0.07	17.2	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	0.06	0.06	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
EP2403299-001	Anonymous	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
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 5669267)									
EP2403218-014	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	0.06	0.05	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
EP2403299-001	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: 5669267)									
EP2403218-014	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

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: 5669267) - continued									
EP2403218-014	Anonymous	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
EP2403299-001	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: 5669267)									
EP2403218-014	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
EP2403299-001	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: 5669267)									

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 (%)*
EP231P: PFAS Sums (QC Lot: 5669267) - continued									
EP2403218-014	Anonymous	EP231X: Sum of PFAS	----	0.01	µg/L	0.46	0.50	8.3	0% - 20%
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	0.34	0.32	6.1	0% - 20%
		EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	0.40	0.44	9.5	0% - 20%
EP2403299-001	Anonymous	EP231X: Sum of PFAS	----	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	<0.01	<0.01	0.0	No Limit

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
ED037P: Alkalinity by PC Titrator (QCLot: 5671373)								
ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	----	----	----	----
ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	----	----	----	----
ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	<1	----	----	----	----
ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	<1	20 mg/L	96.6	85.1	126
				<1	200 mg/L	102	90.5	111
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 5665951)								
ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<1	25 mg/L	102	89.9	112
				<1	500 mg/L	98.9	89.9	112
ED045G: Chloride by Discrete Analyser (QCLot: 5665952)								
ED045G: Chloride	16887-00-6	1	mg/L	<1	10 mg/L	97.1	88.6	113
				<1	1000 mg/L	93.8	88.6	113
ED093F: Dissolved Major Cations (QCLot: 5666286)								
ED093F: Calcium	7440-70-2	1	mg/L	<1	50 mg/L	102	86.5	117
ED093F: Magnesium	7439-95-4	1	mg/L	<1	50 mg/L	101	88.4	110
ED093F: Sodium	7440-23-5	1	mg/L	<1	50 mg/L	100	91.4	113
ED093F: Potassium	7440-09-7	1	mg/L	<1	50 mg/L	96.4	84.6	108
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5669267)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.2218 µg/L	102	72.0	130
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.2352 µg/L	93.3	71.0	127
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	0.2373 µg/L	95.4	68.0	131
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.238 µg/L	88.2	69.0	134
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.232 µg/L	97.0	65.0	140
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.241 µg/L	84.0	53.0	142
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5669267)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	1.25 µg/L	93.8	73.0	129
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	0.25 µg/L	101	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	96.2	72.0	130
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	0.25 µg/L	104	71.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	0.25 µg/L	100	69.0	130

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
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5669267) - continued								
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	0.25 µg/L	106	71.0	129
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	0.25 µg/L	113	69.0	133
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	0.25 µg/L	110	72.0	134
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	0.25 µg/L	108	65.0	144
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	0.25 µg/L	105	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5669267)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.25 µg/L	104	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	0.625 µg/L	96.8	68.0	141
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	0.625 µg/L	# 142	60.5	138
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	0.625 µg/L	100	68.3	134
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	0.625 µg/L	95.6	62.2	138
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	0.25 µg/L	114	65.0	136
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	0.25 µg/L	103	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5669267)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.2343 µg/L	103	63.0	143
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	0.2378 µg/L	104	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	0.24 µg/L	104	67.0	138
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	0.241 µg/L	81.7	64.2	133
EP231P: PFAS Sums (QCLot: 5669267)								
EP231X: Sum of PFAS	----	0.01	µg/L	<0.01	----	----	----	----
EP231X: Sum of PFHxS and PFOS	355-46-4/17 63-23-1	0.01	µg/L	<0.01	----	----	----	----
EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	<0.01	----	----	----	----

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
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 5665951)							
EP2403219-001	0089_SW372_240312						

Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 5665951) - continued							
EP2403219-001	0089_SW372_240312	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	100 mg/L	# Not Determined	70.4	130
ED045G: Chloride by Discrete Analyser (QCLot: 5665952)							
EP2403219-001	0089_SW372_240312	ED045G: Chloride	16887-00-6	200 mg/L	# Not Determined	70.0	130
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5669267)							
EP2403218-015	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.2218 µg/L	89.4	72.0	129
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.232 µg/L	103	71.0	127
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.2352 µg/L	110	68.0	129
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.238 µg/L	93.6	69.0	134
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.232 µg/L	125	65.0	140
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.241 µg/L	103	53.0	129
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5669267)							
EP2403218-015	Anonymous	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	1.25 µg/L	97.9	73.0	142
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.25 µg/L	122	72.0	129
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.25 µg/L	99.7	72.0	129
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.25 µg/L	87.3	72.0	130
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.25 µg/L	104	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	118	71.0	134
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.25 µg/L	116	69.0	133
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.25 µg/L	127	72.0	134
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.25 µg/L	114	65.0	144
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.25 µg/L	97.8	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5669267)							
EP2403218-015	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.25 µg/L	101	59.0	135
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.625 µg/L	114	70.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.625 µg/L	# 174	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.625 µg/L	100	70.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.625 µg/L	91.2	70.0	130
		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	114	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5669267)							

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: 5669267) - continued							
EP2403218-015	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.234 µg/L	109	63.0	143
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.2378 µg/L	103	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.24 µg/L	105	67.0	138
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.2415 µg/L	89.1	70.0	130

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **EP2403219**	Page	: 1 of 5
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Telephone	: +61-8-9406 1301
Project	: WA_0089_PFASOMP_24	Date Samples Received	: 13-Mar-2024
Site	: Stirling SW/PW - JS	Issue Date	: 25-Mar-2024
Sampler	: [redacted]	No. of samples received	: 3
Order number	: pfas-omp/Stirling	No. of samples analysed	: 3

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.**
- **Laboratory Control outliers exist - please see following pages for full details.**
- **Matrix Spike outliers exist - please see following pages for full details.**
- **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.**

Outliers : Quality Control Samples

Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

Matrix: **WATER**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
Laboratory Control Spike (LCS) Recoveries							
EP231C: Perfluoroalkyl Sulfonamides	QC-5669267-002	----	**N-Ethyl perfluorooctane sulfonamide (EtFOSA)**	4151-50-2	142 %	60.5-138%	**Recovery greater than upper control limit**
Matrix Spike (MS) Recoveries							
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA	EP2403219--001	0089_SW372_240312	**Sulfate as SO4 - Turbidimetric**	14808-79-8	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
ED045G: Chloride by Discrete Analyser	EP2403219--001	0089_SW372_240312	**Chloride**	16887-00-6	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
EP231C: Perfluoroalkyl Sulfonamides	EP2403218--015	Anonymous	**N-Ethyl perfluorooctane sulfonamide (EtFOSA)**	4151-50-2	174 %	70.0-130%	**Recovery greater than upper data quality objective**

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
ED037P: Alkalinity by PC Titrator								
Clear Plastic Bottle - Natural (ED037-P)								
0089_SW372_240312, 0089_PW346_240312	0089_SW373_240312,	**12-Mar-2024**	**----**	----	**----**	**19-Mar-2024**	26-Mar-2024	✓
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA								
Clear Plastic Bottle - Natural (ED041G)								
0089_SW372_240312, 0089_PW346_240312	0089_SW373_240312,	**12-Mar-2024**	**----**	----	**----**	**21-Mar-2024**	09-Apr-2024	✓
ED045G: Chloride by Discrete Analyser								
Clear Plastic Bottle - Natural (ED045G)								
0089_SW372_240312, 0089_PW346_240312	0089_SW373_240312,	**12-Mar-2024**	**----**	----	**----**	**21-Mar-2024**	09-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
ED093F: Dissolved Major Cations							
Clear Plastic Bottle - Natural (ED093F)							
0089_SW372_240312, 0089_SW373_240312, 0089_PW346_240312	**12-Mar-2024**	**----**	----	**----**	**19-Mar-2024**	19-Mar-2024	✓
EP231A: Perfluoroalkyl Sulfonic Acids							
HDPE (no PTFE) (EP231X)							
0089_SW372_240312, 0089_SW373_240312, 0089_PW346_240312	**12-Mar-2024**	**18-Mar-2024**	08-Sep-2024	✓	**18-Mar-2024**	08-Sep-2024	✓
EP231B: Perfluoroalkyl Carboxylic Acids							
HDPE (no PTFE) (EP231X)							
0089_SW372_240312, 0089_SW373_240312, 0089_PW346_240312	**12-Mar-2024**	**18-Mar-2024**	08-Sep-2024	✓	**18-Mar-2024**	08-Sep-2024	✓
EP231C: Perfluoroalkyl Sulfonamides							
HDPE (no PTFE) (EP231X)							
0089_SW372_240312, 0089_SW373_240312, 0089_PW346_240312	**12-Mar-2024**	**18-Mar-2024**	08-Sep-2024	✓	**18-Mar-2024**	08-Sep-2024	✓
EP231D: (n:2) Fluorotelomer Sulfonic Acids							
HDPE (no PTFE) (EP231X)							
0089_SW372_240312, 0089_SW373_240312, 0089_PW346_240312	**12-Mar-2024**	**18-Mar-2024**	08-Sep-2024	✓	**18-Mar-2024**	08-Sep-2024	✓
EP231P: PFAS Sums							
HDPE (no PTFE) (EP231X)							
0089_SW372_240312, 0089_SW373_240312, 0089_PW346_240312	**12-Mar-2024**	**18-Mar-2024**	08-Sep-2024	✓	**18-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)							
Alkalinity by Auto Titrator	ED037-P	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	19	**10.53**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	1	4	**25.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	18	**11.11**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	19	**10.53**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Alkalinity by Auto Titrator	ED037-P	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	19	**10.53**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	1	4	**25.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	18	**5.56**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	19	**10.53**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Alkalinity by Auto Titrator	ED037-P	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	1	19	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	1	4	**25.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	18	**5.56**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	19	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Chloride by Discrete Analyser	ED045G	1	19	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	18	**5.56**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	19	**5.26**	**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
Alkalinity by Auto Titrator	ED037-P	WATER	In house: Referenced to APHA 2320 B This procedure determines alkalinity by automated measurement (e.g. PC Titrate) on a settled supernatant aliquot of the sample using pH 4.5 for indicating the total alkalinity end-point. This method is compliant with NEPM Schedule B(3)
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	WATER	In house: Referenced to APHA 4500-SO4. Dissolved sulfate is determined in a 0.45um filtered sample. Sulfate ions are converted to a barium sulfate suspension in an acetic acid medium with barium chloride. Light absorbance of the BaSO4 suspension is measured by a photometer and the SO4-2 concentration is determined by comparison of the reading with a standard curve. This method is compliant with NEPM Schedule B(3)
Chloride by Discrete Analyser	ED045G	WATER	In house: Referenced to APHA 4500 Cl - G.The thiocyanate ion is liberated from mercuric thiocyanate through sequestration of mercury by the chloride ion to form non-ionised mercuric chloride. In the presence of ferric ions the liberated thiocynate forms highly-coloured ferric thiocynate which is measured at 480 nm.
Major Cations - Dissolved	ED093F	WATER	In house: Referenced to APHA 3120 and 3125; USEPA SW 846 - 6010 and 6020; Cations are determined by either ICP-AES or ICP-MS techniques. This method is compliant with NEPM Schedule B(3) Sodium Adsorption Ratio is calculated from Ca, Mg and Na which determined by ALS in house method QWI-EN/ED093F. This method is compliant with NEPM Schedule B(3) Hardness parameters are calculated based on APHA 2340 B. This method is compliant with NEPM Schedule B(3)
Ionic Balance by PCT DA and Turbi SO4 DA	* EN055 - PG	WATER	In house: Referenced to APHA 1030F. This method is compliant with NEPM Schedule B(3)
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.

ALSCompass
SAMPLING *Intelligence*

ALS

Environmental Division
Perth
Work Order Reference
EP2403220

Telephone +61-8-9406 1301

Custody Document for Submissions via ALS Compass App

Project: WA_0089_PFASOMP_24 **Client:** Stantec

Project Manager: [redacted]
Phone: [redacted]

ALS Compass COC Reference: 64954; 64944; 64940; 64939; 64941; 64947; 64949 **# Samples:**

Sampler: [redacted]
Phone: [redacted]

Turnaround Requirements: Standard Urgent

Special Instructions:

Custody:

Relinquished by: [redacted]	Received by: [redacted]	Relinquished by:	Received by:
Date / Time: 12/3/24 ~3:09pm	Date / Time: 13/3 12|S	Date / Time:	Date / Time:

CHAIN OF CUSTODY

COC#: **64984** *ALS Laboratory:* EP Perth Environmental

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

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP_24

SITE: Stirling SD - JS

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted]

QUOTE NO: SY/139/19 B

SAMPLER MOBILE: [redacted] / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES 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 Sediments SEDIMENT	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
001	0089_SD346		12/03/2024 01:13 PM	SOIL	ALS: 1 Non ALS: 0	No	X		

CHAIN OF CUSTODY

COC#: **64984** *ALS Laboratory:* EP Perth Environmental

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

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP_24

SITE: Stirling SD - JS

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES 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	0089_SD346	HDPE Soil Jar	200 mL	00621222089046	Grey	No	

Total Bottle Count: ALS: 1, Non ALS: 0

SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : **EP2403220**

Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: Customer Services EP
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
E-mail	: [redacted]stantec.com	E-mail	: ALSEnviro.Perth@alsglobal.com
Telephone	: ----	Telephone	: +61-8-9406 1301
Facsimile	: ----	Facsimile	: +61-8-9406 1399
Project	: WA_0089_PFASOMP_24	Page	: 1 of 2
Order number	: pfas-omp/Stirling	Quote number	: ES2022MWHAUS0002 (SY/139/19 B)
C-O-C number	: 64984	QC Level	: NEPM 2013 B3 & ALS QC Standard
Site	: Stirling SD - JS		
Sampler	: [redacted]		

Dates

Date Samples Received	: 13-Mar-2024 12:15	Issue Date	: 15-Mar-2024
Client Requested Due Date	: 22-Mar-2024	Scheduled Reporting Date	: **22-Mar-2024**

Delivery Details

Mode of Delivery	: Carrier	Security Seal	: Not Available
No. of coolers/boxes	: 2	Temperature	: 14.9 - Ice present
Receipt Detail	:	No. of samples received / analysed	: 1 / 1

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 see scanned COC for sample discrepencies: extra samples , samples not received etc.
- Please direct any queries related to sample condition / numbering / breakages to Sample Receipt (Samples.Perth@alsglobal.com)
- Analytical work for this work order will be conducted at ALS Environmental Perth.
- Please direct any turnaround / technical queries to the laboratory contact designated above.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months) from receipt of samples.
- **pH analysis should be conducted within 6 hours of sampling.**
- **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.**
- 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: **SOIL**

Laboratory sample ID	Sampling date / time	Sample ID	SOIL - EA055-103 Moisture Content	SOIL - EP231X (solids) PFAS - Full Suite (28 analytes)
EP2403220-001	12-Mar-2024 13:13	0089_SD346_240312	✓	✓

Proactive Holding Time Report

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

Requested Deliverables

[redacted]

- A4 - AU Tax Invoice (INV)	Email	[redacted]cardno.com.au
DERP LAB REPORTS		
- *AU Certificate of Analysis - NATA (COA)	Email	derp.labreports@esdat.com.au
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	derp.labreports@esdat.com.au
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	derp.labreports@esdat.com.au
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)	Email	derp.labreports@esdat.com.au
- Chain of Custody (CoC) (COC)	Email	derp.labreports@esdat.com.au
- EDI Format - ESDAT (ESDAT)	Email	derp.labreports@esdat.com.au
- EDI Format - XTab (XTAB)	Email	derp.labreports@esdat.com.au

[redacted]

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

CERTIFICATE OF ANALYSIS

Work Order	: **EP2403220**	Page	: 1 of 5
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: Customer Services EP
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: +61-8-9406 1301
Project	: WA_0089_PFASOMP_24	Date Samples Received	: 13-Mar-2024 12:15
Order number	: pfas-omp/Stirling	Date Analysis Commenced	: 18-Mar-2024
C-O-C number	: 64984	Issue Date	: 21-Mar-2024 23:40
Sampler	: [redacted]		
Site	: Stirling SD - JS		
Quote number	: SY/139/19 B		
No. of samples received	: 1		
No. of samples analysed	: 1		

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]	Inorganics Supervisor	Perth Inorganics, Wangara, WA
[redacted]	Senior Organic Chemist	Perth Organics, Wangara, WA

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.

- 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: SEDIMENT (Matrix: SOIL)				Sample ID	0089_SD346_240312	----	----	----	----
				Sampling date / time	12-Mar-2024 13:13	----	----	----	----
Compound	CAS Number	LOR	Unit		EP2403220-001	--------	--------	--------	--------
					Result	----	----	----	----
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content	----	0.1	%		**29.7**	----	----	----	----
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg		<0.0002	----	----	----	----
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg		<0.0002	----	----	----	----
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg		<0.0002	----	----	----	----
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg		<0.0002	----	----	----	----
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg		**0.0004**	----	----	----	----
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg		<0.0002	----	----	----	----
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg		<0.001	----	----	----	----
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg		<0.0002	----	----	----	----
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg		<0.0002	----	----	----	----
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg		<0.0002	----	----	----	----
Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg		<0.0002	----	----	----	----
Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg		<0.0002	----	----	----	----
Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg		<0.0002	----	----	----	----
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg		<0.0002	----	----	----	----
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg		<0.0002	----	----	----	----
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg		<0.0002	----	----	----	----
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg		<0.0005	----	----	----	----
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg		<0.0002	----	----	----	----

Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)				Sample ID	0089_SD346_240312	----	----	----	----
				Sampling date / time	12-Mar-2024 13:13	----	----	----	----
Compound	CAS Number	LOR	Unit		EP2403220-001	--------	--------	--------	--------
					Result	----	----	----	----
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg		<0.0005	----	----	----	----
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg		<0.0005	----	----	----	----
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg		<0.0005	----	----	----	----
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg		<0.0005	----	----	----	----
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg		<0.0002	----	----	----	----
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg		<0.0002	----	----	----	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg		<0.0005	----	----	----	----
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg		<0.0005	----	----	----	----
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg		<0.0005	----	----	----	----
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg		<0.0005	----	----	----	----
EP231P: PFAS Sums									
Sum of PFAS	----	0.0002	mg/kg		**0.0004**	----	----	----	----
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg		**0.0004**	----	----	----	----
Sum of PFAS (WA DER List)	----	0.0002	mg/kg		**0.0004**	----	----	----	----
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.0002	%		**102**	----	----	----	----
13C8-PFOA	----	0.0002	%		**103**	----	----	----	----

Surrogate Control Limits

Sub-Matrix: **SEDIMENT**		Recovery Limits (%)	
Compound	*CAS Number*	*Low*	*High*
EP231S: PFAS Surrogate			
13C4-PFOS	----	76	136
13C8-PFOA	----	78	131

QUALITY CONTROL REPORT

Work Order	: **EP2403220**	Page	: 1 of 7
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: Customer Services EP
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: +61-8-9406 1301
Project	: WA_0089_PFASOMP_24	Date Samples Received	: 13-Mar-2024
Order number	: pfas-omp/Stirling	Date Analysis Commenced	: 18-Mar-2024
C-O-C number	: 64984	Issue Date	: 21-Mar-2024
Sampler	: [redacted] [redacted]		
Site	: Stirling SD - JS		
Quote number	: SY/139/19 B		
No. of samples received	: 1		
No. of samples analysed	: 1		

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]	Inorganics Supervisor	Perth Inorganics, Wangara, WA
[redacted]	Senior Organic Chemist	Perth Organics, Wangara, WA

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: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
EA055: Moisture Content (Dried @ 105-110°C) (QC Lot: 5672500)									
EP2403217-001	Anonymous	EA055: Moisture Content	----	0.1	%	30.0	30.3	1.1	0% - 20%
EP2403225-007	Anonymous	EA055: Moisture Content	----	0.1	%	14.6	14.2	2.7	0% - 20%
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 5666652)									
EP2403217-001	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	0.0002	0.0003	41.9	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
EP2403225-007	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 5666652)									
EP2403217-001	Anonymous	EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit

Sub-Matrix: **SOIL**

Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Laboratory Duplicate (DUP) Report					
				LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 5666652) - continued									
EP2403217-001	Anonymous	EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	<0.001	0.0	No Limit
EP2403225-007	Anonymous	EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	<0.001	0.0	No Limit
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 5666652)									
EP2403217-001	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
EP2403225-007	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit

Sub-Matrix: **SOIL**

				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: 5666652) - continued									
EP2403225-007	Anonymous	EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 5666652)									
EP2403217-001	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
EP2403225-007	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
EP231P: PFAS Sums (QC Lot: 5666652)									
EP2403217-001	Anonymous	EP231X: Sum of PFAS	----	0.0002	mg/kg	0.0002	0.0003	40.0	No Limit
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg	0.0002	0.0003	40.0	No Limit
		EP231X: Sum of PFAS (WA DER List)	----	0.0002	mg/kg	0.0002	0.0003	40.0	No Limit
EP2403225-007	Anonymous	EP231X: Sum of PFAS	----	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Sum of PFAS (WA DER List)	----	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit

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: **SOIL**

				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: 5666652)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	0.0011 mg/kg	99.5	72.0	128
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	0.00125 mg/kg	104	73.0	123
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	0.00118 mg/kg	94.5	67.0	130
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	0.00119 mg/kg	100	70.0	132
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	0.00116 mg/kg	94.4	68.0	136
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	0.0012 mg/kg	94.2	59.0	134
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5666652)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	0.00625 mg/kg	110	71.0	135
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	0.00125 mg/kg	101	69.0	132
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	0.00125 mg/kg	96.4	70.0	132
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	0.00125 mg/kg	98.0	71.0	131
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	102	69.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	104	72.0	129
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	0.00125 mg/kg	92.0	69.0	133
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	106	64.0	136
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	102	69.0	135
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	96.0	66.0	139
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	0.00125 mg/kg	91.6	69.0	133
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5666652)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	0.00125 mg/kg	96.0	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	0.00312 mg/kg	113	59.6	143
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	0.00312 mg/kg	103	62.8	140
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	0.00312 mg/kg	114	61.5	139
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	0.00312 mg/kg	103	61.9	139
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	0.00125 mg/kg	103	63.0	144
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	0.00125 mg/kg	94.8	61.0	139
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5666652)								

Sub-Matrix: **SOIL**

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: 5666652) - continued								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	0.00117 mg/kg	113	62.0	145
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	0.00118 mg/kg	106	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	0.0012 mg/kg	112	65.0	137
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	0.0012 mg/kg	83.3	54.8	124
EP231P: PFAS Sums (QCLot: 5666652)								
EP231X: Sum of PFAS	----	0.0002	mg/kg	<0.0002	----	----	----	----
EP231X: Sum of PFHxS and PFOS	355-46-4/17 63-23-1	0.0002	mg/kg	<0.0002	----	----	----	----
EP231X: Sum of PFAS (WA DER List)	----	0.0002	mg/kg	<0.0002	----	----	----	----

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: **SOIL**

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: 5666652)							
EP2403217-002	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0011 mg/kg	102	72.0	128
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.00117 mg/kg	114	73.0	123
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.00118 mg/kg	97.9	67.0	130
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.00119 mg/kg	101	70.0	132
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.00116 mg/kg	94.5	68.0	136
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0012 mg/kg	103	59.0	134
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5666652)							
EP2403217-002	Anonymous	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.00625 mg/kg	131	71.0	135
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.00125 mg/kg	97.2	69.0	132
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.00125 mg/kg	94.4	70.0	132
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.00125 mg/kg	97.2	71.0	131
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.00125 mg/kg	100	69.0	133
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.00125 mg/kg	102	72.0	129
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.00125 mg/kg	93.2	69.0	133
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.00125 mg/kg	107	64.0	136
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.00125 mg/kg	99.6	69.0	135
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.00125 mg/kg	97.2	66.0	139
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.00125 mg/kg	96.8	69.0	133
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5666652)							

Sub-Matrix: **SOIL**

				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: 5666652) - continued							
EP2403217-002	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.00125 mg/kg	95.2	48.0	128
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.00312 mg/kg	112	60.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.00312 mg/kg	103	60.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.00312 mg/kg	106	60.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.00312 mg/kg	109	60.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.00125 mg/kg	104	63.0	144
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.00125 mg/kg	100	61.0	139
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5666652)							
EP2403217-002	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.00117 mg/kg	107	62.0	145
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.00118 mg/kg	109	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0012 mg/kg	104	65.0	137
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0012 mg/kg	77.5	60.0	130

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **EP2403220**	Page	: 1 of 4
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Telephone	: +61-8-9406 1301
Project	: WA_0089_PFASOMP_24	Date Samples Received	: 13-Mar-2024
Site	: Stirling SD - JS	Issue Date	: 21-Mar-2024
Sampler	: [redacted]	No. of samples received	: 1
Order number	: pfas-omp/Stirling	No. of samples analysed	: 1

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: **SOIL**

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
EA055: Moisture Content (Dried @ 105-110°C)							
HDPE Soil Jar (EA055)							
0089_SD346_240312	**12-Mar-2024**	**----**	----	----	**19-Mar-2024**	26-Mar-2024	✓
EP231A: Perfluoroalkyl Sulfonic Acids							
HDPE Soil Jar (EP231X)							
0089_SD346_240312	**12-Mar-2024**	**18-Mar-2024**	08-Sep-2024	✓	**18-Mar-2024**	27-Apr-2024	✓
EP231B: Perfluoroalkyl Carboxylic Acids							
HDPE Soil Jar (EP231X)							
0089_SD346_240312	**12-Mar-2024**	**18-Mar-2024**	08-Sep-2024	✓	**18-Mar-2024**	27-Apr-2024	✓
EP231C: Perfluoroalkyl Sulfonamides							
HDPE Soil Jar (EP231X)							
0089_SD346_240312	**12-Mar-2024**	**18-Mar-2024**	08-Sep-2024	✓	**18-Mar-2024**	27-Apr-2024	✓
EP231D: (n:2) Fluorotelomer Sulfonic Acids							
HDPE Soil Jar (EP231X)							
0089_SD346_240312	**12-Mar-2024**	**18-Mar-2024**	08-Sep-2024	✓	**18-Mar-2024**	27-Apr-2024	✓
EP231P: PFAS Sums							
HDPE Soil Jar (EP231X)							
0089_SD346_240312	**12-Mar-2024**	**18-Mar-2024**	08-Sep-2024	✓	**18-Mar-2024**	27-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: **SOIL**

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)							
Moisture Content	EA055	2	11	**18.18**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	20	**5.00**	**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
Moisture Content	EA055	SOIL	In house: A gravimetric procedure based on weight loss over a 12 hour drying period at 105-110 degrees C. This method is compliant with NEPM Schedule B(3).
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	SOIL	In-house: Analysis of soils by solvent extraction followed by LC-Electrospray-MS-MS, Negative Mode using MRM using internal standard quantitation. Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to a portion of soil which is then extracted with MTBE and an ion pairing reagent. A portion of extract is exchanged into the analytical solvent mixture, combined with an equal volume reagent water and 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
QuECheRS Extraction of Solids	* ORG71	SOIL	In house: Sequential extractions with Acetonitrile/Methanol by shaking. Extraction efficiency aided by the addition of salts under acidic conditions. Where relevant, interferences from co-extracted organics are removed with dispersive clean-up media (dSPE). The extract is either diluted or concentrated and exchanged into the analytical solvent.

ALSCompass
SAMPLING *Intelligence*

Environmental Division
Perth
Work Order Reference
EP2403224

Telephone +61-8-9406 1301

Custody Document for Submissions via ALS Compass App

Project: WA_0089_PRASOMP_24 **Client:** Stantec

Project Manager: [redacted]

ALS Compass COC Reference: 64954; 64944; 64940; 64939; 64941; 64967; 64969 **# Samples:**

Sampler: [redacted]

Phone: [redacted]

Turnaround Requirements: Standard Urgent

Special Instructions:

Custody:

Relinquished by: [redacted]	Received by: [redacted]	Relinquished by:	Received by:
Date / Time: 12/3/24 - 3:09pm	Date / Time: 13/3 12|5	Date / Time:	Date / Time:

CHAIN OF CUSTODY

COC#: 64939 *ALS Laboratory:* EP Perth Environmental

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

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP_24

SITE: Stirling SW/PW - SC

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES 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	WA OMP Water Suite WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
001	0089_SW408		12/03/2024 09:27 AM	WATER	ALS: 3 Non ALS: 0	No	X		
002	0089_QC114		12/03/2024 09:28 AM	WATER	ALS: 3 Non ALS: 0	No	X		
003	0089_PW405		12/03/2024 09:28 AM	WATER	ALS: 3 Non ALS: 0	No	X		
004	0089_PW407		12/03/2024 09:30 AM	WATER	ALS: 3 Non ALS: 0	No	X		
005	0089_SW406	Lab QCs added	12/03/2024 09:31 AM	WATER	ALS: 5 Non ALS: 0	No	X		
006	0089_SW410		12/03/2024 10:16 AM	WATER	ALS: 3 Non ALS: 0	No	X		
007	0089_PW409	Lab QC added	12/03/2024 10:17 AM	WATER	ALS: 5 Non ALS: 0	No	X		

CHAIN OF CUSTODY

COC#: 64939 ALS Laboratory: EP Perth Environmental

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

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP_24

SITE: Stirling SW/PW - SC

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES 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	WA OMP Water Suite WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
008	0089_SW416		12/03/2024 10:50 AM	WATER	ALS: 3 Non ALS: 0	No	X		
009	0089_SW412		12/03/2024 10:51 AM	WATER	ALS: 3 Non ALS: 0	No	X		
010	0089_PW415		12/03/2024 10:51 AM	WATER	ALS: 3 Non ALS: 0	No	X		
011	0089_PW413		12/03/2024 10:52 AM	WATER	ALS: 3 Non ALS: 0	No	X		
012	0089_PW411		12/03/2024 10:53 AM	WATER	ALS: 3 Non ALS: 0	No	X		
013	0089_SW414	Lab QCs added	12/03/2024 10:54 AM	WATER	ALS: 5 Non ALS: 0	No	X		

CHAIN OF CUSTODY

ALS COC#: 64939 ALS Laboratory: EP Perth Environmental

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

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP_24

SITE: Stirling SW/PW - SC

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO: [redacted]

CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

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	0089_SW408	Clear Plastic Bottle - Natural	125 mL	00070821217497	Green	No	
001	0089_SW408	HDPE (no PTFE)	20 mL	00352309066010	Grey	No	
001	0089_SW408	HDPE (no PTFE)	20 mL	00352309065806	Grey	No	
002	0089_QC114	Clear Plastic Bottle - Natural	125 mL	00070821217587	Green	No	
002	0089_QC114	HDPE (no PTFE)	20 mL	00352309065750	Grey	No	
002	0089_QC114	HDPE (no PTFE)	20 mL	00352309065745	Grey	No	
003	0089_PW405	Clear Plastic Bottle - Natural	125 mL	00070821217349	Green	No	
003	0089_PW405	HDPE (no PTFE)	20 mL	00352309065843	Grey	No	
003	0089_PW405	HDPE (no PTFE)	20 mL	00352309065830	Grey	No	
004	0089_PW407	Clear Plastic Bottle - Natural	125 mL	00070821217535	Green	No	
004	0089_PW407	HDPE (no PTFE)	20 mL	00352309065905	Grey	No	
004	0089_PW407	HDPE (no PTFE)	20 mL	00352309065934	Grey	No	
005	0089_SW406	Clear Plastic Bottle - Natural	125 mL	00070821217596	Green	No	
005	0089_SW406	HDPE (no PTFE)	20 mL	00352309065817	Grey	No	
005	0089_SW406	HDPE (no PTFE)	20 mL	00352309065873	Grey	No	
005	0089_SW406	HDPE (no PTFE)	20 mL	00352312003738	Grey	No	
005	0089_SW406	HDPE (no PTFE)	20 mL	00352312004417	Grey	No	
006	0089_SW410	Clear Plastic Bottle - Natural	125 mL	00070821217411	Green	No	
006	0089_SW410	HDPE (no PTFE)	20 mL	00352309065838	Grey	No	
006	0089_SW410	HDPE (no PTFE)	20 mL	00352309065765	Grey	No	
007	0089_PW409	Clear Plastic Bottle - Natural	125 mL	00070821217320	Green	No	
007	0089_PW409	HDPE (no PTFE)	20 mL	00352309065995	Grey	No	
007	0089_PW409	HDPE (no PTFE)	20 mL	00352309065982	Grey	No	
007	0089_PW409	HDPE (no PTFE)	20 mL	00352312004519	Grey	No	
007	0089_PW409	HDPE (no PTFE)	20 mL	00352312004157	Grey	No	
008	0089_SW416	Clear Plastic Bottle - Natural	125 mL	00070821217586	Green	No	

7:35:26 AM

CHAIN OF CUSTODY

COC#: 64939 *ALS Laboratory:* EP Perth Environmental

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

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP_24

SITE: Stirling SW/PW - SC

ORDER NO: pfas-omp/Stirling

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: [redacted]

CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO: [redacted]

008	0089_SW416	HDPE (no PTFE)	20 mL	00352309065749	Grey	No	
008	0089_SW416	HDPE (no PTFE)	20 mL	00352309065892	Grey	No	
009	0089_SW412	Clear Plastic Bottle - Natural	125 mL	00070821217549	Green	No	
009	0089_SW412	HDPE (no PTFE)	20 mL	00352309065876	Grey	No	
009	0089_SW412	HDPE (no PTFE)	20 mL	00352309065933	Grey	No	
010	0089_PW415	HDPE (no PTFE)	20 mL	00352309065774	Grey	No	
010	0089_PW415	HDPE (no PTFE)	20 mL	00352309066022	Grey	No	
010	0089_PW415	Clear Plastic Bottle - Natural	125 mL	00070821217440	Green	No	
011	0089_PW413	Clear Plastic Bottle - Natural	125 mL	00070821217347	Green	No	
011	0089_PW413	HDPE (no PTFE)	20 mL	00352309065964	Grey	No	
011	0089_PW413	HDPE (no PTFE)	20 mL	00352309065845	Grey	No	
012	0089_PW411	Clear Plastic Bottle - Natural	125 mL	00070821217562	Green	No	
012	0089_PW411	HDPE (no PTFE)	20 mL	00352309065783	Grey	No	
012	0089_PW411	HDPE (no PTFE)	20 mL	00352309065811	Grey	No	
013	0089_SW414	Clear Plastic Bottle - Natural	125 mL	00070821217503	Green	No	
013	0089_SW414	HDPE (no PTFE)	20 mL	00352309065793	Grey	No	
013	0089_SW414	HDPE (no PTFE)	20 mL	00352309065975	Grey	No	
013	0089_SW414	HDPE (no PTFE)	20 mL	00352312003752	Grey	No	
013	0089_SW414	HDPE (no PTFE)	20 mL	00352312003980	Grey	No	

Total Bottle Count: ALS: 45, Non ALS: 0

SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : **EP2403224**

Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: Customer Services EP
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
E-mail	: [redacted]stantec.com	E-mail	: ALSEnviro.Perth@alsglobal.com
Telephone	: ----	Telephone	: +61-8-9406 1301
Facsimile	: ----	Facsimile	: +61-8-9406 1399
Project	: WA_0089_PFASOMP_24	Page	: 1 of 2
Order number	: pfas-omp/Stirling	Quote number	: ES2022MWHAUS0002 (SY/139/19 B)
C-O-C number	: 64939	QC Level	: NEPM 2013 B3 & ALS QC Standard
Site	: Stirling SW/PW - SC		
Sampler	: [redacted]		

Dates

Date Samples Received	: 13-Mar-2024 12:15	Issue Date	: 15-Mar-2024
Client Requested Due Date	: 22-Mar-2024	Scheduled Reporting Date	: **22-Mar-2024**

Delivery Details

Mode of Delivery	: Carrier	Security Seal	: Not Available
No. of coolers/boxes	: 2	Temperature	: 14.9 - Ice present
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 see scanned COC for sample discrepencies: extra samples , samples not received etc.
- Please direct any queries related to sample condition / numbering / breakages to Sample Receipt (Samples.Perth@alsglobal.com)
- Analytical work for this work order will be conducted at ALS Environmental Perth.
- Please direct any turnaround / technical queries to the laboratory contact designated above.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months) from receipt of samples.
- **pH analysis should be conducted within 6 hours of sampling.**
- **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.**
- 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)	WATER - NT-01 & 02 Ca, Mg, Na, K, Cl, SO4, Alkalinity
EP2403224-001	12-Mar-2024 09:27	0089_SW408_240312	✓	✓
EP2403224-002	12-Mar-2024 09:28	0089_QC114_240312	✓	✓
EP2403224-003	12-Mar-2024 09:28	0089_PW405_240312	✓	✓
EP2403224-004	12-Mar-2024 09:30	0089_PW407_240312	✓	✓
EP2403224-005	12-Mar-2024 09:31	0089_SW406_240312	✓	✓
EP2403224-006	12-Mar-2024 10:16	0089_SW410_240312	✓	✓
EP2403224-007	12-Mar-2024 10:17	0089_PW409_240312	✓	✓
EP2403224-008	12-Mar-2024 10:50	0089_SW416_240312	✓	✓
EP2403224-009	12-Mar-2024 10:51	0089_SW412_240312	✓	✓
EP2403224-010	12-Mar-2024 10:51	0089_PW415_240312	✓	✓
EP2403224-011	12-Mar-2024 10:52	0089_PW413_240312	✓	✓
EP2403224-012	12-Mar-2024 10:53	0089_PW411_240312	✓	✓
EP2403224-013	12-Mar-2024 10:54	0089_SW414_240312	✓	✓

Proactive Holding Time Report

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

Requested Deliverables

[redacted]
- A4 - AU Tax Invoice (INV) — Email — [redacted]cardno.com.au

DERP LAB REPORTS
- *AU Certificate of Analysis - NATA (COA) — Email — derp.labreports@esdat.com.au
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI) — Email — derp.labreports@esdat.com.au
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC) — Email — derp.labreports@esdat.com.au
- A4 - AU Sample Receipt Notification - Environmental HT (SRN) — Email — derp.labreports@esdat.com.au
- Chain of Custody (CoC) (COC) — Email — derp.labreports@esdat.com.au
- EDI Format - ESDAT (ESDAT) — Email — derp.labreports@esdat.com.au
- EDI Format - XTab (XTAB) — Email — derp.labreports@esdat.com.au

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

CERTIFICATE OF ANALYSIS

Work Order	: **EP2403224**	Page	: 1 of 15
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: Customer Services EP
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: +61-8-9406 1301
Project	: WA_0089_PFASOMP_24	Date Samples Received	: 13-Mar-2024 12:15
Order number	: pfas-omp/Stirling	Date Analysis Commenced	: 15-Mar-2024
C-O-C number	: 64939	Issue Date	: 21-Mar-2024 23:42
Sampler	: [redacted]		
Site	: Stirling SW/PW - SC		
Quote number	: SY/139/19 B		
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]	Inorganics Supervisor	Perth Inorganics, Wangara, WA
[redacted]	Senior Organic Chemist	Perth Organics, Wangara, WA

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.
- As per QWI – EN55-3 Data Interpreting Procedures, Ionic balances are typically calculated using Major Anions - Chloride, Alkalinity and Sulfate; and Major Cations - Calcium, Magnesium, Potassium and Sodium. Where applicable and dependent upon sample matrix, the Ionic Balance may also include the additional contribution of Ammonia, Dissolved Metals by ICPMS and H+ to the Cations and Nitrate, SiO2 and Fluoride to the Anions.
- EP231X: High LCS and MS recoveries deemed acceptable as all associated analyte results are less than LOR.
- Sodium Adsorption Ratio (where reported): Where results for Na, Ca or Mg are <LOR, a concentration at half the reported LOR is incorporated into the SAR calculation. This represents a conservative approach for Na relative to the assumption that <LOR = zero concentration and a conservative approach for Ca & Mg relative to the assumption that <LOR is equivalent to the LOR concentration.
- 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.
- ED045G: The presence of Thiocyanate, Thiosulfate and Sulfite can positively contribute to the chloride result, thereby may bias results higher than expected. Results should be scrutinised accordingly.

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_PW413_240312	0089_PW411_240312	----	----	----
				Sampling date / time	12-Mar-2024 10:52	12-Mar-2024 10:53	----	----	----
Compound	CAS Number	LOR	Unit		EP2403224-011	EP2403224-012	--------	--------	--------
					Result	Result	----	----	----
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	<1	----	----	----
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	<1	----	----	----
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		249	245	----	----	----
Total Alkalinity as CaCO3	----	1	mg/L		249	245	----	----	----
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		2640	2750	----	----	----
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		21000	20900	----	----	----
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		508	524	----	----	----
Magnesium	7439-95-4	1	mg/L		1590	1580	----	----	----
Sodium	7440-23-5	1	mg/L		11900	11800	----	----	----
Potassium	7440-09-7	1	mg/L		647	639	----	----	----
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		652	652	----	----	----
ø Total Cations	----	0.01	meq/L		690	686	----	----	----
ø Ionic Balance	----	0.01	%		2.83	2.55	----	----	----
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		<0.01	<0.01	----	----	----
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		<0.01	<0.01	----	----	----
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	<0.02	----	----	----

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_PW413_240312	0089_PW411_240312	----	----	----
				Sampling date / time	12-Mar-2024 10:52	12-Mar-2024 10:53	----	----	----
Compound	CAS Number	LOR	Unit		EP2403224-011	EP2403224-012	--------	--------	--------
					Result	Result	----	----	----
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		<0.1	<0.1	----	----	----
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		<0.01	<0.01	----	----	----
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		<0.05	<0.05	----	----	----
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L		<0.02	<0.02	----	----	----
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L		<0.05	<0.05	----	----	----
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L		<0.05	<0.05	----	----	----
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L		<0.05	<0.05	----	----	----
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L		<0.05	<0.05	----	----	----
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L		<0.02	<0.02	----	----	----
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L		<0.02	<0.02	----	----	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids									

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_PW413_240312	0089_PW411_240312	----	----	----
				Sampling date / time	12-Mar-2024 10:52	12-Mar-2024 10:53	----	----	----
Compound	CAS Number	LOR	Unit		EP2403224-011	EP2403224-012	--------	--------	--------
					Result	Result	----	----	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L		<0.05	<0.05	----	----	----
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		<0.05	<0.05	----	----	----
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		<0.05	<0.05	----	----	----
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L		<0.05	<0.05	----	----	----
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L		<0.01	<0.01	----	----	----
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		<0.01	<0.01	----	----	----
Sum of PFAS (WA DER List)	----	0.01	µg/L		<0.01	<0.01	----	----	----
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**108**	**113**	----	----	----
13C8-PFOA	----	0.02	%		**103**	**106**	----	----	----

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_SW408_240312	0089_QC114_240312	0089_PW405_240312	0089_PW407_240312	0089_SW406_240312
				Sampling date / time	12-Mar-2024 09:27	12-Mar-2024 09:28	12-Mar-2024 09:28	12-Mar-2024 09:30	12-Mar-2024 09:31
Compound	CAS Number	LOR	Unit		EP2403224-001	EP2403224-002	EP2403224-003	EP2403224-004	EP2403224-005
					Result	Result	Result	Result	Result
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	<1	<1	<1	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	<1	<1	<1	<1
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		130	112	112	319	130
Total Alkalinity as CaCO3	----	1	mg/L		130	112	112	319	130
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		2780	2800	2760	2050	2760
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		21000	21200	21200	16000	20900
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		466	478	516	358	489
Magnesium	7439-95-4	1	mg/L		1480	1540	1640	1120	1550
Sodium	7440-23-5	1	mg/L		11100	11500	12300	8330	11700
Potassium	7440-09-7	1	mg/L		591	616	666	447	626
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		653	658	658	500	650
ø Total Cations	----	0.01	meq/L		643	666	713	484	677
ø Ionic Balance	----	0.01	%		0.76	0.60	4.02	1.68	2.06
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

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_SW408_240312	0089_QC114_240312	0089_PW405_240312	0089_PW407_240312	0089_SW406_240312
				Sampling date / time	12-Mar-2024 09:27	12-Mar-2024 09:28	12-Mar-2024 09:28	12-Mar-2024 09:30	12-Mar-2024 09:31
Compound	CAS Number	LOR	Unit		EP2403224-001	EP2403224-002	EP2403224-003	EP2403224-004	EP2403224-005
					Result	Result	Result	Result	Result
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
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									

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_SW408_240312	0089_QC114_240312	0089_PW405_240312	0089_PW407_240312	0089_SW406_240312
				Sampling date / time	12-Mar-2024 09:27	12-Mar-2024 09:28	12-Mar-2024 09:28	12-Mar-2024 09:30	12-Mar-2024 09:31
Compound	CAS Number	LOR	Unit		EP2403224-001	EP2403224-002	EP2403224-003	EP2403224-004	EP2403224-005
					Result	Result	Result	Result	Result
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
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	%		**116**	**114**	**119**	**102**	**102**
13C8-PFOA	----	0.02	%		**109**	**108**	**108**	**118**	**99.3**

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_SW410_240312	0089_PW409_240312	0089_SW416_240312	0089_SW412_240312	0089_PW415_240312
				Sampling date / time	12-Mar-2024 10:16	12-Mar-2024 10:17	12-Mar-2024 10:50	12-Mar-2024 10:51	12-Mar-2024 10:51
Compound	CAS Number	LOR	Unit		EP2403224-006	EP2403224-007	EP2403224-008	EP2403224-009	EP2403224-010
					Result	Result	Result	Result	Result
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	<1	<1	<1	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	<1	<1	<1	<1
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		132	127	123	123	144
Total Alkalinity as CaCO3	----	1	mg/L		132	127	123	123	144
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		2740	2750	2720	2750	2700
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		20900	21200	21000	20900	21100
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		478	474	470	493	471
Magnesium	7439-95-4	1	mg/L		1510	1500	1490	1560	1500
Sodium	7440-23-5	1	mg/L		11300	11300	11200	11700	11300
Potassium	7440-09-7	1	mg/L		611	605	601	634	605
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		649	658	651	649	654
ø Total Cations	----	0.01	meq/L		655	654	649	678	654
ø Ionic Balance	----	0.01	%		0.46	0.28	0.22	2.17	0.03
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

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_SW410_240312	0089_PW409_240312	0089_SW416_240312	0089_SW412_240312	0089_PW415_240312
				Sampling date / time	12-Mar-2024 10:16	12-Mar-2024 10:17	12-Mar-2024 10:50	12-Mar-2024 10:51	12-Mar-2024 10:51
Compound	CAS Number	LOR	Unit		EP2403224-006	EP2403224-007	EP2403224-008	EP2403224-009	EP2403224-010
					Result	Result	Result	Result	Result
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
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									

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_SW410_240312	0089_PW409_240312	0089_SW416_240312	0089_SW412_240312	0089_PW415_240312
				Sampling date / time	12-Mar-2024 10:16	12-Mar-2024 10:17	12-Mar-2024 10:50	12-Mar-2024 10:51	12-Mar-2024 10:51
Compound	CAS Number	LOR	Unit		EP2403224-006	EP2403224-007	EP2403224-008	EP2403224-009	EP2403224-010
					Result	Result	Result	Result	Result
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
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	%		**106**	**106**	**111**	**100**	**104**
13C8-PFOA	----	0.02	%		**103**	**113**	**105**	**111**	**111**

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_SW414_240312	----	----	----	----
				Sampling date / time	12-Mar-2024 10:54	----	----	----	----
Compound	CAS Number	LOR	Unit		EP2403224-013	--------	--------	--------	--------
					Result	----	----	----	----
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	----	----	----	----
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	----	----	----	----
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		**123**	----	----	----	----
Total Alkalinity as CaCO3	----	1	mg/L		**123**	----	----	----	----
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		**2710**	----	----	----	----
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		**21100**	----	----	----	----
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		**479**	----	----	----	----
Magnesium	7439-95-4	1	mg/L		**1520**	----	----	----	----
Sodium	7440-23-5	1	mg/L		**11400**	----	----	----	----
Potassium	7440-09-7	1	mg/L		**613**	----	----	----	----
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		**654**	----	----	----	----
ø Total Cations	----	0.01	meq/L		**660**	----	----	----	----
ø Ionic Balance	----	0.01	%		**0.49**	----	----	----	----
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	----	----	----	----

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_SW414_240312	----	----	----	----
				Sampling date / time	12-Mar-2024 10:54	----	----	----	----
Compound	CAS Number	LOR	Unit		EP2403224-013	--------	--------	--------	--------
					Result	----	----	----	----
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	----	----	----	----
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									

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_SW414_240312	----	----	----	----
				Sampling date / time	12-Mar-2024 10:54	----	----	----	----
Compound	CAS Number	LOR	Unit		EP2403224-013	--------	--------	--------	--------
					Result	----	----	----	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
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	%		**108**	----	----	----	----
13C8-PFOA	----	0.02	%		**108**	----	----	----	----

Surrogate Control Limits

Sub-Matrix: GROUNDWATER		Recovery Limits (%)	
Compound	CAS Number	Low	High
EP231S: PFAS Surrogate			
13C4-PFOS	----	65	140
13C8-PFOA	----	71	133

Sub-Matrix: SURFACE WATER		Recovery Limits (%)	
Compound	CAS Number	Low	High
EP231S: PFAS Surrogate			
13C4-PFOS	----	65	140
13C8-PFOA	----	71	133

QUALITY CONTROL REPORT

Work Order	: **EP2403224**	Page	: 1 of 13
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: Customer Services EP
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: +61-8-9406 1301
Project	: WA_0089_PFASOMP_24	Date Samples Received	: 13-Mar-2024
Order number	: pfas-omp/Stirling	Date Analysis Commenced	: 15-Mar-2024
C-O-C number	: 64939	Issue Date	: 21-Mar-2024
Sampler	: [redacted] [redacted]		
Site	: Stirling SW/PW - SC		
Quote number	: SY/139/19 B		
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]	Inorganics Supervisor	Perth Inorganics, Wangara, WA
[redacted]	Senior Organic Chemist	Perth Organics, Wangara, WA

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 (%)
ED037P: Alkalinity by PC Titrator (QC Lot: 5665986)									
EP2403224-002	0089_QC114_240312	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	112	112	0.0	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	112	112	0.0	0% - 20%
EP2403224-012	0089_PW411_240312	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	245	243	0.7	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	245	243	0.7	0% - 20%
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QC Lot: 5665951)									
EP2403219-001	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	28	31	8.4	0% - 20%
EP2403224-008	0089_SW416_240312	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	2720	2720	0.0	0% - 20%
ED045G: Chloride by Discrete Analyser (QC Lot: 5665952)									
EP2403219-001	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	144	141	1.6	0% - 20%
EP2403224-008	0089_SW416_240312	ED045G: Chloride	16887-00-6	1	mg/L	21000	20800	1.3	0% - 20%
ED093F: Dissolved Major Cations (QC Lot: 5666294)									
EP2403224-001	0089_SW408_240312	ED093F: Calcium	7440-70-2	1	mg/L	466	520	10.9	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	1480	1640	10.6	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	11100	12400	11.1	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	591	666	12.0	0% - 20%
EP2403224-011	0089_PW413_240312	ED093F: Calcium	7440-70-2	1	mg/L	508	507	0.2	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	1590	1560	1.9	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	11900	11700	2.3	0% - 20%

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 (%)
ED093F: Dissolved Major Cations (QC Lot: 5666294) - continued									
EP2403224-011	0089_PW413_240312	ED093F: Potassium	7440-09-7	1	mg/L	647	631	2.5	0% - 20%
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 5669267)									
EP2403218-014	Anonymous	EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	0.34	0.32	7.1	0% - 20%
		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	<0.08	0.07	17.2	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	0.06	0.06	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
EP2403299-001	Anonymous	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: 5669292)									
EP2403224-005	0089_SW406_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
EP2403224-013	0089_SW414_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
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 5669267)									
EP2403218-014	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	0.06	0.05	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

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: 5669267) - continued									
EP2403218-014	Anonymous	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
EP2403299-001	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
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 5669292)									
EP2403224-005	0089_SW406_240312	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
EP2403224-013	0089_SW414_240312	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: 5669267)									

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: 5669267) - continued									
EP2403218-014	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
EP2403299-001	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
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 5669292)									
EP2403224-005	0089_SW406_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
EP2403224-013	0089_SW414_240312	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: 5669292) - continued									
EP2403224-013	0089_SW414_240312	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: 5669267)									
EP2403218-014	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
EP2403299-001	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
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 5669292)									
EP2403224-005	0089_SW406_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
EP2403224-013	0089_SW414_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

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: 5669292) - continued									
EP2403224-013	0089_SW414_240312	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: 5669267)									
EP2403218-014	Anonymous	EP231X: Sum of PFAS	----	0.01	µg/L	0.46	0.50	8.3	0% - 20%
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	0.34	0.32	6.1	0% - 20%
		EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	0.40	0.44	9.5	0% - 20%
EP2403299-001	Anonymous	EP231X: Sum of PFAS	----	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	<0.01	<0.01	0.0	No Limit
EP231P: PFAS Sums (QC Lot: 5669292)									
EP2403224-005	0089_SW406_240312	EP231X: Sum of PFAS	----	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	<0.01	<0.01	0.0	No Limit
EP2403224-013	0089_SW414_240312	EP231X: Sum of PFAS	----	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	<0.01	<0.01	0.0	No Limit

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
ED037P: Alkalinity by PC Titrator (QCLot: 5665986)								
ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	----	----	----	----
ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	----	----	----	----
ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	<1	----	----	----	----
ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	<1	20 mg/L	96.6	85.1	126
				<1	200 mg/L	101	90.5	111
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 5665951)								
ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<1	25 mg/L	102	89.9	112
				<1	500 mg/L	98.9	89.9	112
ED045G: Chloride by Discrete Analyser (QCLot: 5665952)								
ED045G: Chloride	16887-00-6	1	mg/L	<1	10 mg/L	97.1	88.6	113
				<1	1000 mg/L	93.8	88.6	113
ED093F: Dissolved Major Cations (QCLot: 5666294)								
ED093F: Calcium	7440-70-2	1	mg/L	<1	50 mg/L	101	86.5	117
ED093F: Magnesium	7439-95-4	1	mg/L	<1	50 mg/L	100	88.4	110
ED093F: Sodium	7440-23-5	1	mg/L	<1	50 mg/L	98.2	91.4	113
ED093F: Potassium	7440-09-7	1	mg/L	<1	50 mg/L	96.0	84.6	108
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5669267)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.2218 µg/L	102	72.0	130
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.2352 µg/L	93.3	71.0	127
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	0.2373 µg/L	95.4	68.0	131
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.238 µg/L	88.2	69.0	134
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.232 µg/L	97.0	65.0	140
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.241 µg/L	84.0	53.0	142
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5669292)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.2218 µg/L	100	72.0	130
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.2352 µg/L	99.3	71.0	127
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	0.2373 µg/L	92.9	68.0	131
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.238 µg/L	93.3	69.0	134
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.232 µg/L	94.2	65.0	140
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.241 µg/L	96.3	53.0	142

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: 5669267)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	1.25 µg/L	93.8	73.0	129
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	0.25 µg/L	101	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	96.2	72.0	130
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	0.25 µg/L	104	71.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	0.25 µg/L	100	69.0	130
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	0.25 µg/L	106	71.0	129
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	0.25 µg/L	113	69.0	133
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	0.25 µg/L	110	72.0	134
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	0.25 µg/L	108	65.0	144
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	0.25 µg/L	105	71.0	132
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5669292)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	1.25 µg/L	107	73.0	129
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	0.25 µg/L	100	72.0	129
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	0.25 µg/L	99.2	72.0	129
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	0.25 µg/L	98.4	72.0	130
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	0.25 µg/L	115	71.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	0.25 µg/L	105	69.0	130
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	0.25 µg/L	105	71.0	129
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	0.25 µg/L	111	69.0	133
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	0.25 µg/L	100	72.0	134
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	0.25 µg/L	110	65.0	144
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	0.25 µg/L	124	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5669267)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.25 µg/L	104	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	0.625 µg/L	96.8	68.0	141
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	0.625 µg/L	# 142	60.5	138
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	0.625 µg/L	100	68.3	134
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	0.625 µg/L	95.6	62.2	138
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	0.25 µg/L	114	65.0	136
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	0.25 µg/L	103	61.0	135

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: 5669292)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.25 µg/L	114	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	0.625 µg/L	110	68.0	141
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	0.625 µg/L	126	60.5	138
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	0.625 µg/L	105	68.3	134
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	0.625 µg/L	108	62.2	138
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	0.25 µg/L	108	65.0	136
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	0.25 µg/L	108	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5669267)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.2343 µg/L	103	63.0	143
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	0.2378 µg/L	104	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	0.24 µg/L	104	67.0	138
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	0.241 µg/L	81.7	64.2	133
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5669292)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.2343 µg/L	103	63.0	143
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	0.2378 µg/L	109	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	0.24 µg/L	105	67.0	138
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	0.241 µg/L	90.2	64.2	133
EP231P: PFAS Sums (QCLot: 5669267)								
EP231X: Sum of PFAS	----	0.01	µg/L	<0.01	----	----	----	----
EP231X: Sum of PFHxS and PFOS	355-46-4/17 63-23-1	0.01	µg/L	<0.01	----	----	----	----
EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	<0.01	----	----	----	----
EP231P: PFAS Sums (QCLot: 5669292)								
EP231X: Sum of PFAS	----	0.01	µg/L	<0.01	----	----	----	----
EP231X: Sum of PFHxS and PFOS	355-46-4/17 63-23-1	0.01	µg/L	<0.01	----	----	----	----
EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	<0.01	----	----	----	----

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**

Matrix Spike (MS) Report

Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 5665951)							
EP2403219-001	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	100 mg/L	85.5	70.4	130
ED045G: Chloride by Discrete Analyser (QCLot: 5665952)							
EP2403219-001	Anonymous	ED045G: Chloride	16887-00-6	200 mg/L	109	70.0	130
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5669267)							
EP2403218-015	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.2218 µg/L	89.4	72.0	129
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.232 µg/L	103	71.0	127
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.2352 µg/L	110	68.0	129
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.238 µg/L	93.6	69.0	134
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.232 µg/L	125	65.0	140
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.241 µg/L	103	53.0	129
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5669292)							
EP2403224-007	0089_PW409_240312	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.2218 µg/L	99.0	72.0	129
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.232 µg/L	98.2	71.0	127
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.2352 µg/L	89.7	68.0	129
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.238 µg/L	90.1	69.0	134
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.232 µg/L	92.3	65.0	140
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.241 µg/L	91.9	53.0	129
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5669267)							
EP2403218-015	Anonymous	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	1.25 µg/L	97.9	73.0	142
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.25 µg/L	122	72.0	129
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.25 µg/L	99.7	72.0	129
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.25 µg/L	87.3	72.0	130
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.25 µg/L	104	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	118	71.0	134
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.25 µg/L	116	69.0	133
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.25 µg/L	127	72.0	134
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.25 µg/L	114	65.0	144
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.25 µg/L	97.8	71.0	132
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5669292)							
EP2403224-007	0089_PW409_240312	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	1.25 µg/L	105	73.0	142
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.25 µg/L	115	72.0	129
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.25 µg/L	96.2	72.0	129
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.25 µg/L	92.8	72.0	130
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.25 µg/L	108	71.0	133
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.25 µg/L	100	69.0	130
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.25 µg/L	102	71.0	134
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.25 µg/L	111	69.0	133

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: 5669292) - continued							
EP2403224-007	0089_PW409_240312	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	93.4	65.0	144
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.25 µg/L	114	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5669267)							
EP2403218-015	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.25 µg/L	101	59.0	135
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.625 µg/L	114	70.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.625 µg/L	# 174	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.625 µg/L	100	70.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.625 µg/L	91.2	70.0	130
		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	114	61.0	135
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5669292)							
EP2403224-007	0089_PW409_240312	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.25 µg/L	113	59.0	135
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.625 µg/L	112	70.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.625 µg/L	93.4	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.625 µg/L	109	70.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.625 µg/L	103	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.25 µg/L	123	65.0	136
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.25 µg/L	92.4	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5669267)							
EP2403218-015	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.234 µg/L	109	63.0	143
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.2378 µg/L	103	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.24 µg/L	105	67.0	138
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.2415 µg/L	89.1	70.0	130
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5669292)							
EP2403224-007	0089_PW409_240312	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.234 µg/L	95.1	63.0	143
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.2378 µg/L	101	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.24 µg/L	113	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: 5669292) - continued							
EP2403224-007	0089_PW409_240312	EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.2415 µg/L	96.1	70.0	130

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **EP2403224**	Page	: 1 of 6
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Telephone	: +61-8-9406 1301
Project	: WA_0089_PFASOMP_24	Date Samples Received	: 13-Mar-2024
Site	: Stirling SW/PW - SC	Issue Date	: 21-Mar-2024
Sampler	: [redacted]	No. of samples received	: 13
Order number	: pfas-omp/Stirling	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.**
- **Laboratory Control outliers exist - please see following pages for full details.**
- **Matrix Spike outliers exist - please see following pages for full details.**
- **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.**

Outliers : Quality Control Samples

Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

Matrix: **WATER**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
Laboratory Control Spike (LCS) Recoveries							
EP231C: Perfluoroalkyl Sulfonamides	QC-5669267-002	----	**N-Ethyl perfluorooctane sulfonamide (EtFOSA)**	4151-50-2	142 %	60.5-138%	**Recovery greater than upper control limit**
Matrix Spike (MS) Recoveries							
EP231C: Perfluoroalkyl Sulfonamides	EP2403218--015	Anonymous	**N-Ethyl perfluorooctane sulfonamide (EtFOSA)**	4151-50-2	174 %	70.0-130%	**Recovery greater than upper data quality objective**

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
ED037P: Alkalinity by PC Titrator							
Clear Plastic Bottle - Natural (ED037-P)							
0089_SW408_240312, 0089_QC114_240312, 0089_PW405_240312, 0089_PW407_240312, 0089_SW406_240312, 0089_SW410_240312, 0089_PW409_240312, 0089_SW416_240312, 0089_SW412_240312, 0089_PW415_240312, 0089_PW413_240312, 0089_PW411_240312, 0089_SW414_240312	**12-Mar-2024**	**----**	----	**----**	**18-Mar-2024**	26-Mar-2024	✓
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA							
Clear Plastic Bottle - Natural (ED041G)							
0089_SW408_240312, 0089_QC114_240312, 0089_PW405_240312, 0089_PW407_240312, 0089_SW406_240312, 0089_SW410_240312, 0089_PW409_240312, 0089_SW416_240312, 0089_SW412_240312, 0089_PW415_240312, 0089_PW413_240312, 0089_PW411_240312, 0089_SW414_240312	**12-Mar-2024**	**----**	----	**----**	**21-Mar-2024**	09-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
ED045G: Chloride by Discrete Analyser								
Clear Plastic Bottle - Natural (ED045G)								
0089_SW408_240312,	0089_QC114_240312,	**12-Mar-2024**	**----**	----	----	**21-Mar-2024**	09-Apr-2024	✓
0089_PW405_240312,	0089_PW407_240312,							
0089_SW406_240312,	0089_SW410_240312,							
0089_PW409_240312,	0089_SW416_240312,							
0089_SW412_240312,	0089_PW415_240312,							
0089_PW413_240312,	0089_PW411_240312,							
0089_SW414_240312								
ED093F: Dissolved Major Cations								
Clear Plastic Bottle - Natural (ED093F)								
0089_SW408_240312,	0089_QC114_240312,	**12-Mar-2024**	**----**	----	----	**19-Mar-2024**	19-Mar-2024	✓
0089_PW405_240312,	0089_PW407_240312,							
0089_SW406_240312,	0089_SW410_240312,							
0089_PW409_240312,	0089_SW416_240312,							
0089_SW412_240312,	0089_PW415_240312,							
0089_PW413_240312,	0089_PW411_240312,							
0089_SW414_240312								
EP231A: Perfluoroalkyl Sulfonic Acids								
HDPE (no PTFE) (EP231X)								
0089_SW408_240312,	0089_QC114_240312	**12-Mar-2024**	**18-Mar-2024**	08-Sep-2024	✓	**18-Mar-2024**	08-Sep-2024	✓
HDPE (no PTFE) (EP231X)								
0089_PW405_240312,	0089_PW407_240312,	**12-Mar-2024**	**18-Mar-2024**	08-Sep-2024	✓	**19-Mar-2024**	08-Sep-2024	✓
0089_SW406_240312,	0089_SW410_240312,							
0089_PW409_240312,	0089_SW416_240312,							
0089_SW412_240312,	0089_PW415_240312,							
0089_PW413_240312,	0089_PW411_240312,							
0089_SW414_240312								
EP231B: Perfluoroalkyl Carboxylic Acids								
HDPE (no PTFE) (EP231X)								
0089_SW408_240312,	0089_QC114_240312	**12-Mar-2024**	**18-Mar-2024**	08-Sep-2024	✓	**18-Mar-2024**	08-Sep-2024	✓
HDPE (no PTFE) (EP231X)								
0089_PW405_240312,	0089_PW407_240312,	**12-Mar-2024**	**18-Mar-2024**	08-Sep-2024	✓	**19-Mar-2024**	08-Sep-2024	✓
0089_SW406_240312,	0089_SW410_240312,							
0089_PW409_240312,	0089_SW416_240312,							
0089_SW412_240312,	0089_PW415_240312,							
0089_PW413_240312,	0089_PW411_240312,							
0089_SW414_240312								

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) 0089_SW408_240312, 0089_QC114_240312	**12-Mar-2024**	**18-Mar-2024**	08-Sep-2024	✓	**18-Mar-2024**	08-Sep-2024	✓
HDPE (no PTFE) (EP231X) 0089_PW405_240312, 0089_PW407_240312, 0089_SW406_240312, 0089_SW410_240312, 0089_PW409_240312, 0089_SW416_240312, 0089_SW412_240312, 0089_PW415_240312, 0089_PW413_240312, 0089_PW411_240312, 0089_SW414_240312	**12-Mar-2024**	**18-Mar-2024**	08-Sep-2024	✓	**19-Mar-2024**	08-Sep-2024	✓
EP231D: (n:2) Fluorotelomer Sulfonic Acids							
HDPE (no PTFE) (EP231X) 0089_SW408_240312, 0089_QC114_240312	**12-Mar-2024**	**18-Mar-2024**	08-Sep-2024	✓	**18-Mar-2024**	08-Sep-2024	✓
HDPE (no PTFE) (EP231X) 0089_PW405_240312, 0089_PW407_240312, 0089_SW406_240312, 0089_SW410_240312, 0089_PW409_240312, 0089_SW416_240312, 0089_SW412_240312, 0089_PW415_240312, 0089_PW413_240312, 0089_PW411_240312, 0089_SW414_240312	**12-Mar-2024**	**18-Mar-2024**	08-Sep-2024	✓	**19-Mar-2024**	08-Sep-2024	✓
EP231P: PFAS Sums							
HDPE (no PTFE) (EP231X) 0089_SW408_240312, 0089_QC114_240312	**12-Mar-2024**	**18-Mar-2024**	08-Sep-2024	✓	**18-Mar-2024**	08-Sep-2024	✓
HDPE (no PTFE) (EP231X) 0089_PW405_240312, 0089_PW407_240312, 0089_SW406_240312, 0089_SW410_240312, 0089_PW409_240312, 0089_SW416_240312, 0089_SW412_240312, 0089_PW415_240312, 0089_PW413_240312, 0089_PW411_240312, 0089_SW414_240312	**12-Mar-2024**	**18-Mar-2024**	08-Sep-2024	✓	**19-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)							
Alkalinity by Auto Titrator	ED037-P	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	19	**10.53**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	2	19	**10.53**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	4	38	**10.53**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	19	**10.53**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Alkalinity by Auto Titrator	ED037-P	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	19	**10.53**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	1	19	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	38	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	19	**10.53**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Alkalinity by Auto Titrator	ED037-P	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	1	19	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	1	19	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	38	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	19	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Chloride by Discrete Analyser	ED045G	1	19	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	38	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	19	**5.26**	**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
Alkalinity by Auto Titrator	ED037-P	WATER	In house: Referenced to APHA 2320 B This procedure determines alkalinity by automated measurement (e.g. PC Titrate) on a settled supernatant aliquot of the sample using pH 4.5 for indicating the total alkalinity end-point. This method is compliant with NEPM Schedule B(3)
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	WATER	In house: Referenced to APHA 4500-SO4. Dissolved sulfate is determined in a 0.45um filtered sample. Sulfate ions are converted to a barium sulfate suspension in an acetic acid medium with barium chloride. Light absorbance of the BaSO4 suspension is measured by a photometer and the SO4-2 concentration is determined by comparison of the reading with a standard curve. This method is compliant with NEPM Schedule B(3)
Chloride by Discrete Analyser	ED045G	WATER	In house: Referenced to APHA 4500 Cl - G.The thiocyanate ion is liberated from mercuric thiocyanate through sequestration of mercury by the chloride ion to form non-ionised mercuric chloride. In the presence of ferric ions the liberated thiocynate forms highly-coloured ferric thiocynate which is measured at 480 nm.
Major Cations - Dissolved	ED093F	WATER	In house: Referenced to APHA 3120 and 3125; USEPA SW 846 - 6010 and 6020; Cations are determined by either ICP-AES or ICP-MS techniques. This method is compliant with NEPM Schedule B(3) Sodium Adsorption Ratio is calculated from Ca, Mg and Na which determined by ALS in house method QWI-EN/ED093F. This method is compliant with NEPM Schedule B(3) Hardness parameters are calculated based on APHA 2340 B. This method is compliant with NEPM Schedule B(3)
Ionic Balance by PCT DA and Turbi SO4 DA	* EN055 - PG	WATER	In house: Referenced to APHA 1030F. This method is compliant with NEPM Schedule B(3)
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.

ALSCompass SAMPLING *Intelligence*

Environmental Division
Perth
Work Order Reference
EP2403225

Telephone +61-8-9406 1301

Custody Document for Submissions via ALS Compass App

Project: WA_0089_PFASOMP_24 **Client:** Stantec

Project Manager: [redacted]
Phone: [redacted]

ALS Compass COC Reference: 64954; 64944; 64940; 64939; 64941; 64947; 64949 **# Samples:**

Sampler: [redacted]
Phone: [redacted]

Turnaround Requirements: Standard **Urgent**

Special Instructions:

Custody:

Relinquished by: [redacted]	Received by: [redacted]	Relinquished by:	Received by:
Date / Time: 12/3/24 - 3:09pm	Date / Time: 13/3 1215	Date / Time:	Date / Time:

CHAIN OF CUSTODY

(ALS) COC#: **64940** *ALS Laboratory:* EP Perth Environmental

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

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP_24

SITE: Stirling SD - SC

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES 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 Sediments SEDIMENT	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
001	0089_QC115		12/03/2024 09:26 AM	SOIL	ALS: 1 Non ALS: 0	No	X		
002	0089_SD407		12/03/2024 09:26 AM	SOIL	ALS: 1 Non ALS: 0	No	X		
003	0089_SD405		12/03/2024 09:27 AM	SOIL	ALS: 1 Non ALS: 0	No	X		
004	0089_SD409		12/03/2024 10:19 AM	SOIL	ALS: 1 Non ALS: 0	No	X		
005	0089_SD413		12/03/2024 10:56 AM	SOIL	ALS: 1 Non ALS: 0	No	X		
006	0089_SD411		12/03/2024 10:56 AM	SOIL	ALS: 1 Non ALS: 0	No	X		
007	0089_SD415		12/03/2024 01:07 PM	SOIL	ALS: 1 Non ALS: 0	No	X		

CHAIN OF CUSTODY

COC#: **64940** *ALS Laboratory:* EP Perth Environmental

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

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP_24

SITE: Stirling SD - SC

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES 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	0089_QC115	HDPE Soil Jar	200 mL	00621222089026	Grey	No	
002	0089_SD407	HDPE Soil Jar	200 mL	00621222089125	Grey	No	
003	0089_SD405	HDPE Soil Jar	200 mL	00621222089050	Grey	No	
004	0089_SD409	HDPE Soil Jar	200 mL	00621222089150	Grey	No	
005	0089_SD413	HDPE Soil Jar	200 mL	00621222089024	Grey	No	
006	0089_SD411	HDPE Soil Jar	200 mL	00621222089128	Grey	No	
007	0089_SD415	HDPE Soil Jar	200 mL	00621222089157	Grey	No	

Total Bottle Count: ALS: 7, Non ALS: 0

SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : **EP2403225**

Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: Customer Services EP
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
E-mail	: [redacted]stantec.com	E-mail	: ALSEnviro.Perth@alsglobal.com
Telephone	: ----	Telephone	: +61-8-9406 1301
Facsimile	: ----	Facsimile	: +61-8-9406 1399
Project	: WA_0089_PFASOMP_24	Page	: 1 of 2
Order number	: pfas-omp/Stirling	Quote number	: ES2022MWHAUS0002 (SY/139/19 B)
C-O-C number	: 64940	QC Level	: NEPM 2013 B3 & ALS QC Standard
Site	: Stirling SD - SC		
Sampler	: [redacted]		

Dates

Date Samples Received	: 13-Mar-2024 12:15	Issue Date	: 15-Mar-2024
Client Requested Due Date	: 22-Mar-2024	Scheduled Reporting Date	: **22-Mar-2024**

Delivery Details

Mode of Delivery	: Carrier	Security Seal	: Not Available
No. of coolers/boxes	: 2	Temperature	: 14.9 - Ice present
Receipt Detail	:	No. of samples received / analysed	: 7 / 7

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 see scanned COC for sample discrepencies: extra samples , samples not received etc.
- Please direct any queries related to sample condition / numbering / breakages to Sample Receipt (Samples.Perth@alsglobal.com)
- Analytical work for this work order will be conducted at ALS Environmental Perth.
- Please direct any turnaround / technical queries to the laboratory contact designated above.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months) from receipt of samples.
- **pH analysis should be conducted within 6 hours of sampling.**
- **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.**
- 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: **SOIL**

Laboratory sample ID	Sampling date / time	Sample ID	SOIL - EA055-103 Moisture Content	SOIL - EP231X (solids) PFAS - Full Suite (28 analytes)
EP2403225-001	12-Mar-2024 09:26	0089_QC115_240312	✓	✓
EP2403225-002	12-Mar-2024 09:26	0089_SD407_240312	✓	✓
EP2403225-003	12-Mar-2024 09:27	0089_SD405_240312	✓	✓
EP2403225-004	12-Mar-2024 10:19	0089_SD409_240312	✓	✓
EP2403225-005	12-Mar-2024 10:56	0089_SD413_240312	✓	✓
EP2403225-006	12-Mar-2024 10:56	0089_SD411_240312	✓	✓
EP2403225-007	12-Mar-2024 13:07	0089_SD415_240312	✓	✓

Proactive Holding Time Report

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

Requested Deliverables

[redacted]
- A4 - AU Tax Invoice (INV) — Email — [redacted]cardno.com.au

DERP LAB REPORTS
- *AU Certificate of Analysis - NATA (COA) — Email — derp.labreports@esdat.com.au
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI) — Email — derp.labreports@esdat.com.au
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC) — Email — derp.labreports@esdat.com.au
- A4 - AU Sample Receipt Notification - Environmental HT (SRN) — Email — derp.labreports@esdat.com.au
- Chain of Custody (CoC) (COC) — Email — derp.labreports@esdat.com.au
- EDI Format - ESDAT (ESDAT) — Email — derp.labreports@esdat.com.au
- EDI Format - XTab (XTAB) — Email — derp.labreports@esdat.com.au

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

CERTIFICATE OF ANALYSIS

Work Order	: **EP2403225**	Page	: 1 of 7
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: Customer Services EP
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: +61-8-9406 1301
Project	: WA_0089_PFASOMP_24	Date Samples Received	: 13-Mar-2024 12:15
Order number	: pfas-omp/Stirling	Date Analysis Commenced	: 18-Mar-2024
C-O-C number	: 64940	Issue Date	: 21-Mar-2024 23:43
Sampler	: [redacted]		
Site	: Stirling SD - SC		
Quote number	: SY/139/19 B		
No. of samples received	: 7		
No. of samples analysed	: 7		

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]	Inorganics Supervisor	Perth Inorganics, Wangara, WA
[redacted]	Senior Organic Chemist	Perth Organics, Wangara, WA

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.

- 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: SEDIMENT (Matrix: SOIL)				Sample ID	0089_QC115_240312	0089_SD407_240312	0089_SD405_240312	0089_SD409_240312	0089_SD413_240312
				Sampling date / time	12-Mar-2024 09:26	12-Mar-2024 09:26	12-Mar-2024 09:27	12-Mar-2024 10:19	12-Mar-2024 10:56
Compound	CAS Number	LOR	Unit		EP2403225-001	EP2403225-002	EP2403225-003	EP2403225-004	EP2403225-005
					Result	Result	Result	Result	Result
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content	----	0.1	%		**21.3**	**32.4**	**23.0**	**25.6**	**25.0**
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg		<0.001	<0.001	<0.001	<0.001	<0.001
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002

Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)				Sample ID	0089_QC115_240312	0089_SD407_240312	0089_SD405_240312	0089_SD409_240312	0089_SD413_240312
				Sampling date / time	12-Mar-2024 09:26	12-Mar-2024 09:26	12-Mar-2024 09:27	12-Mar-2024 10:19	12-Mar-2024 10:56
Compound	CAS Number	LOR	Unit		EP2403225-001	EP2403225-002	EP2403225-003	EP2403225-004	EP2403225-005
					Result	Result	Result	Result	Result
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
EP231P: PFAS Sums									
Sum of PFAS	----	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Sum of PFAS (WA DER List)	----	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.0002	%		**102**	**95.0**	**122**	**108**	**111**
13C8-PFOA	----	0.0002	%		**99.0**	**103**	**120**	**102**	**108**

Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)				Sample ID	0089_SD411_240312	0089_SD415_240312	----	----	----
				Sampling date / time	12-Mar-2024 10:56	12-Mar-2024 13:07	----	----	----
Compound	CAS Number	LOR	Unit		EP2403225-006	EP2403225-007	--------	--------	--------
					Result	Result	----	----	----
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content	----	0.1	%		**20.8**	**14.6**	----	----	----
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg		<0.0002	<0.0002	----	----	----
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg		<0.0002	<0.0002	----	----	----
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg		<0.0002	<0.0002	----	----	----
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg		<0.0002	<0.0002	----	----	----
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg		<0.0002	<0.0002	----	----	----
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg		<0.0002	<0.0002	----	----	----
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg		<0.001	<0.001	----	----	----
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg		<0.0002	<0.0002	----	----	----
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg		<0.0002	<0.0002	----	----	----
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg		<0.0002	<0.0002	----	----	----
Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg		<0.0002	<0.0002	----	----	----
Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg		<0.0002	<0.0002	----	----	----
Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg		<0.0002	<0.0002	----	----	----
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg		<0.0002	<0.0002	----	----	----
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg		<0.0002	<0.0002	----	----	----
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg		<0.0002	<0.0002	----	----	----
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg		<0.0005	<0.0005	----	----	----
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg		<0.0002	<0.0002	----	----	----

Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)				Sample ID	0089_SD411_240312	0089_SD415_240312	----	----	----
				Sampling date / time	12-Mar-2024 10:56	12-Mar-2024 13:07	----	----	----
Compound	CAS Number	LOR	Unit		EP2403225-006	EP2403225-007	--------	--------	--------
					Result	Result	----	----	----
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg		<0.0005	<0.0005	----	----	----
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg		<0.0005	<0.0005	----	----	----
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg		<0.0005	<0.0005	----	----	----
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg		<0.0005	<0.0005	----	----	----
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg		<0.0002	<0.0002	----	----	----
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg		<0.0002	<0.0002	----	----	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg		<0.0005	<0.0005	----	----	----
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg		<0.0005	<0.0005	----	----	----
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg		<0.0005	<0.0005	----	----	----
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg		<0.0005	<0.0005	----	----	----
EP231P: PFAS Sums									
Sum of PFAS	----	0.0002	mg/kg		<0.0002	<0.0002	----	----	----
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg		<0.0002	<0.0002	----	----	----
Sum of PFAS (WA DER List)	----	0.0002	mg/kg		<0.0002	<0.0002	----	----	----
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.0002	%		**102**	**97.0**	----	----	----
13C8-PFOA	----	0.0002	%		**102**	**106**	----	----	----

Surrogate Control Limits

Sub-Matrix: **SEDIMENT**		Recovery Limits (%)	
Compound	*CAS Number*	*Low*	*High*
EP231S: PFAS Surrogate			
13C4-PFOS	----	76	136
13C8-PFOA	----	78	131

QUALITY CONTROL REPORT

Work Order	: **EP2403225**	Page	: 1 of 7
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: Customer Services EP
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: +61-8-9406 1301
Project	: WA_0089_PFASOMP_24	Date Samples Received	: 13-Mar-2024
Order number	: pfas-omp/Stirling	Date Analysis Commenced	: 18-Mar-2024
C-O-C number	: 64940	Issue Date	: 21-Mar-2024
Sampler	: [redacted]		
Site	: Stirling SD - SC		
Quote number	: SY/139/19 B		
No. of samples received	: 7		
No. of samples analysed	: 7		

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]	Inorganics Supervisor	Perth Inorganics, Wangara, WA
[redacted]	Senior Organic Chemist	Perth Organics, Wangara, WA

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: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
EA055: Moisture Content (Dried @ 105-110°C) (QC Lot: 5672500)									
EP2403217-001	Anonymous	EA055: Moisture Content	----	0.1	%	30.0	30.3	1.1	0% - 20%
EP2403225-007	0089_SD415_240312	EA055: Moisture Content	----	0.1	%	14.6	14.2	2.7	0% - 20%
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 5666652)									
EP2403217-001	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	0.0002	0.0003	41.9	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
EP2403225-007	0089_SD415_240312	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 5666652)									
EP2403217-001	Anonymous	EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit

Sub-Matrix: **SOIL**

				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: 5666652) - continued									
EP2403217-001	Anonymous	EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	<0.001	0.0	No Limit
EP2403225-007	0089_SD415_240312	EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	<0.001	0.0	No Limit
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 5666652)									
EP2403217-001	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
EP2403225-007	0089_SD415_240312	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit

Sub-Matrix: **SOIL**

				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: 5666652) - continued									
EP2403225-007	0089_SD415_240312	EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 5666652)									
EP2403217-001	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
EP2403225-007	0089_SD415_240312	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
EP231P: PFAS Sums (QC Lot: 5666652)									
EP2403217-001	Anonymous	EP231X: Sum of PFAS	----	0.0002	mg/kg	0.0002	0.0003	40.0	No Limit
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg	0.0002	0.0003	40.0	No Limit
		EP231X: Sum of PFAS (WA DER List)	----	0.0002	mg/kg	0.0002	0.0003	40.0	No Limit
EP2403225-007	0089_SD415_240312	EP231X: Sum of PFAS	----	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Sum of PFAS (WA DER List)	----	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit

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: **SOIL**

				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: 5666652)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	0.0011 mg/kg	99.5	72.0	128
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	0.00125 mg/kg	104	73.0	123
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	0.00118 mg/kg	94.5	67.0	130
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	0.00119 mg/kg	100	70.0	132
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	0.00116 mg/kg	94.4	68.0	136
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	0.0012 mg/kg	94.2	59.0	134
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5666652)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	0.00625 mg/kg	110	71.0	135
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	0.00125 mg/kg	101	69.0	132
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	0.00125 mg/kg	96.4	70.0	132
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	0.00125 mg/kg	98.0	71.0	131
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	102	69.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	104	72.0	129
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	0.00125 mg/kg	92.0	69.0	133
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	106	64.0	136
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	102	69.0	135
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	96.0	66.0	139
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	0.00125 mg/kg	91.6	69.0	133
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5666652)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	0.00125 mg/kg	96.0	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	0.00312 mg/kg	113	59.6	143
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	0.00312 mg/kg	103	62.8	140
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	0.00312 mg/kg	114	61.5	139
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	0.00312 mg/kg	103	61.9	139
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	0.00125 mg/kg	103	63.0	144
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	0.00125 mg/kg	94.8	61.0	139
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5666652)								

Sub-Matrix: **SOIL**

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: 5666652) - continued								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	0.00117 mg/kg	113	62.0	145
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	0.00118 mg/kg	106	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	0.0012 mg/kg	112	65.0	137
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	0.0012 mg/kg	83.3	54.8	124
EP231P: PFAS Sums (QCLot: 5666652)								
EP231X: Sum of PFAS	----	0.0002	mg/kg	<0.0002	----	----	----	----
EP231X: Sum of PFHxS and PFOS	355-46-4/17 63-23-1	0.0002	mg/kg	<0.0002	----	----	----	----
EP231X: Sum of PFAS (WA DER List)	----	0.0002	mg/kg	<0.0002	----	----	----	----

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: **SOIL**

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: 5666652)							
EP2403217-002	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0011 mg/kg	102	72.0	128
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.00117 mg/kg	114	73.0	123
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.00118 mg/kg	97.9	67.0	130
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.00119 mg/kg	101	70.0	132
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.00116 mg/kg	94.5	68.0	136
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0012 mg/kg	103	59.0	134
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5666652)							
EP2403217-002	Anonymous	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.00625 mg/kg	131	71.0	135
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.00125 mg/kg	97.2	69.0	132
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.00125 mg/kg	94.4	70.0	132
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.00125 mg/kg	97.2	71.0	131
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.00125 mg/kg	100	69.0	133
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.00125 mg/kg	102	72.0	129
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.00125 mg/kg	93.2	69.0	133
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.00125 mg/kg	107	64.0	136
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.00125 mg/kg	99.6	69.0	135
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.00125 mg/kg	97.2	66.0	139
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.00125 mg/kg	96.8	69.0	133
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5666652)							

Sub-Matrix: **SOIL**

				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: 5666652) - continued							
EP2403217-002	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.00125 mg/kg	95.2	48.0	128
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.00312 mg/kg	112	60.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.00312 mg/kg	103	60.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.00312 mg/kg	106	60.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.00312 mg/kg	109	60.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.00125 mg/kg	104	63.0	144
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.00125 mg/kg	100	61.0	139
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5666652)							
EP2403217-002	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.00117 mg/kg	107	62.0	145
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.00118 mg/kg	109	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0012 mg/kg	104	65.0	137
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0012 mg/kg	77.5	60.0	130

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **EP2403225**	Page	: 1 of 5
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Telephone	: +61-8-9406 1301
Project	: WA_0089_PFASOMP_24	Date Samples Received	: 13-Mar-2024
Site	: Stirling SD - SC	Issue Date	: 21-Mar-2024
Sampler	: [redacted]	No. of samples received	: 7
Order number	: pfas-omp/Stirling	No. of samples analysed	: 7

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: **SOIL**

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
EA055: Moisture Content (Dried @ 105-110°C)							
HDPE Soil Jar (EA055)							
0089_QC115_240312, 0089_SD407_240312, 0089_SD405_240312, 0089_SD409_240312, 0089_SD413_240312, 0089_SD411_240312, 0089_SD415_240312	**12-Mar-2024**	**----**	----	----	**19-Mar-2024**	26-Mar-2024	✓
EP231A: Perfluoroalkyl Sulfonic Acids							
HDPE Soil Jar (EP231X)							
0089_QC115_240312, 0089_SD407_240312, 0089_SD405_240312, 0089_SD409_240312, 0089_SD413_240312, 0089_SD411_240312, 0089_SD415_240312	**12-Mar-2024**	**18-Mar-2024**	08-Sep-2024	✓	**18-Mar-2024**	27-Apr-2024	✓
EP231B: Perfluoroalkyl Carboxylic Acids							
HDPE Soil Jar (EP231X)							
0089_QC115_240312, 0089_SD407_240312, 0089_SD405_240312, 0089_SD409_240312, 0089_SD413_240312, 0089_SD411_240312, 0089_SD415_240312	**12-Mar-2024**	**18-Mar-2024**	08-Sep-2024	✓	**18-Mar-2024**	27-Apr-2024	✓
EP231C: Perfluoroalkyl Sulfonamides							
HDPE Soil Jar (EP231X)							
0089_QC115_240312, 0089_SD407_240312, 0089_SD405_240312, 0089_SD409_240312, 0089_SD413_240312, 0089_SD411_240312, 0089_SD415_240312	**12-Mar-2024**	**18-Mar-2024**	08-Sep-2024	✓	**18-Mar-2024**	27-Apr-2024	✓
EP231D: (n:2) Fluorotelomer Sulfonic Acids							
HDPE Soil Jar (EP231X)							
0089_QC115_240312, 0089_SD407_240312, 0089_SD405_240312, 0089_SD409_240312, 0089_SD413_240312, 0089_SD411_240312, 0089_SD415_240312	**12-Mar-2024**	**18-Mar-2024**	08-Sep-2024	✓	**18-Mar-2024**	27-Apr-2024	✓

Matrix: **SOIL**

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 Soil Jar (EP231X)							
0089_QC115_240312, 0089_SD407_240312, 0089_SD405_240312, 0089_SD409_240312, 0089_SD413_240312, 0089_SD411_240312, 0089_SD415_240312	**12-Mar-2024**	**18-Mar-2024**	08-Sep-2024	✓	**18-Mar-2024**	27-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: **SOIL**

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)							
Moisture Content	EA055	2	11	**18.18**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	20	**5.00**	**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
Moisture Content	EA055	SOIL	In house: A gravimetric procedure based on weight loss over a 12 hour drying period at 105-110 degrees C. This method is compliant with NEPM Schedule B(3).
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	SOIL	In-house: Analysis of soils by solvent extraction followed by LC-Electrospray-MS-MS, Negative Mode using MRM using internal standard quantitation. Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to a portion of soil which is then extracted with MTBE and an ion pairing reagent. A portion of extract is exchanged into the analytical solvent mixture, combined with an equal volume reagent water and 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
QuECheRS Extraction of Solids	* ORG71	SOIL	In house: Sequential extractions with Acetonitrile/Methanol by shaking. Extraction efficiency aided by the addition of salts under acidic conditions. Where relevant, interferences from co-extracted organics are removed with dispersive clean-up media (dSPE). The extract is either diluted or concentrated and exchanged into the analytical solvent.

ALSCompass
SAMPLING *Intelligence*

Perth
Work Order Reference
EP2403226

Telephone : 61-8-9406 1301

Custody Document for Submissions via ALS Compass App

Project: WA_0089_PFASOMP_24 **Client:** Stantec **Project Manager:** [redacted]

ALS Compass COC Reference: 64954; 64944; 64940; 64939; 64941; 64947; 64949 **# Samples:** **Sampler:** **Phone:** [redacted]

Turnaround Requirements: Standard Urgent

Special Instructions:

Custody:

Relinquished by:	Received by:	Relinquished by:	Received by:
[redacted]	[redacted]		
Date / Time: 12/3/24 ~3:09pm	Date / Time: 13/3 12|5	Date / Time:	Date / Time:

CHAIN OF CUSTODY

COC#: 64941 ALS Laboratory: EP Perth Environmental

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME: 13/3 1215	DATE TIME:	DATE TIME:

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP_24

SITE: Stirling GW - SC

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES 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	WA OMP Water Suite WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
001	0089_MW228		12/03/2024 08:48 AM	WATER	ALS: 3 Non ALS: 0	No	X		
002	0089_QC113		12/03/2024 08:49 AM	WATER	ALS: 3 Non ALS: 0	No	X		
003	0089_MW227	Lab QCs added	12/03/2024 08:49 AM	WATER	ALS: 5 Non ALS: 0	No	X		
004	0089_MW226		12/03/2024 10:18 AM	WATER	ALS: 3 Non ALS: 0	No	X		
005	0089_MW225		12/03/2024 12:16 PM	WATER	ALS: 3 Non ALS: 0	No	X		
006	0089_QC118		12/03/2024 12:17 PM	WATER	ALS: 3 Non ALS: 0	No	X		
007	0089_MW216		12/03/2024 12:23 PM	WATER	ALS: 3 Non ALS: 0	No	X		

CHAIN OF CUSTODY

COC#: 64941 ALS Laboratory: EP Perth Environmental

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

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP_24

SITE: Stirling GW - SC

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted]

QUOTE NO: SY/139/19 B

SAMPLER MOBILE: [redacted] / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES 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	WA OMP Water Suite WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
008	0089_MW196		12/03/2024 01:28 PM	WATER	ALS: 3 Non ALS: 0	No	X		
009	0089_MW158	Lab QC added	12/03/2024 01:37 PM	WATER	ALS: 5 Non ALS: 0	No	X		
010	0089_MW161		12/03/2024 01:57 PM	WATER	ALS: 3 Non ALS: 0	No	X		
011	0089_MW166		12/03/2024 03:15 PM	WATER	ALS: 3 Non ALS: 0	No	X		
012	0089_MW171		12/03/2024 03:16 PM	WATER	ALS: 3 Non ALS: 0	No	X		

CHAIN OF CUSTODY

ALS COC#: 64941 ALS Laboratory: EP Perth Environmental

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

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP_24

SITE: Stirling GW - SC

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES 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	0089_MW228	Clear Plastic Bottle - Natural	125 mL	00070821217511	Green	No	
001	0089_MW228	HDPE (no PTFE)	20 mL	00352309065794	Grey	No	
001	0089_MW228	HDPE (no PTFE)	20 mL	00352309065810	Grey	No	
002	0089_QC113	Clear Plastic Bottle - Natural	125 mL	00070821217481	Green	No	
002	0089_QC113	HDPE (no PTFE)	20 mL	00352309065786	Grey	No	
002	0089_QC113	HDPE (no PTFE)	20 mL	00352309065917	Grey	No	
003	0089_MW227	Clear Plastic Bottle - Natural	125 mL	00070821217537	Green	No	
003	0089_MW227	HDPE (no PTFE)	20 mL	00352309065875	Grey	No	
003	0089_MW227	HDPE (no PTFE)	20 mL	00352309065952	Grey	No	
003	0089_MW227	HDPE (no PTFE)	20 mL	00352312004008	Grey	No	
003	0089_MW227	HDPE (no PTFE)	20 mL	00352312004156	Grey	No	
004	0089_MW226	Clear Plastic Bottle - Natural	125 mL	00070821217484	Green	No	
004	0089_MW226	HDPE (no PTFE)	20 mL	00352309065962	Grey	No	
004	0089_MW226	HDPE (no PTFE)	20 mL	00352309065984	Grey	No	
005	0089_MW225	HDPE (no PTFE)	20 mL	00352309065799	Grey	No	
005	0089_MW225	HDPE (no PTFE)	20 mL	00352309066001	Grey	No	
005	0089_MW225	Clear Plastic Bottle - Natural	125 mL	00070821217406	Green	No	
006	0089_QC118	Clear Plastic Bottle - Natural	125 mL	00070821217454	Green	No	
006	0089_QC118	HDPE (no PTFE)	20 mL	00352309065904	Grey	No	
006	0089_QC118	HDPE (no PTFE)	20 mL	00352309066032	Grey	No	
007	0089_MW216	Clear Plastic Bottle - Natural	125 mL	00070821217490	Green	No	
007	0089_MW216	HDPE (no PTFE)	20 mL	00352309050494	Grey	No	
007	0089_MW216	HDPE (no PTFE)	20 mL	00352309050439	Grey	No	
008	0089_MW196	Clear Plastic Bottle - Natural	125 mL	00070821217462	Green	No	
008	0089_MW196	HDPE (no PTFE)	20 mL	00352309065815	Grey	No	
008	0089_MW196	HDPE (no PTFE)	20 mL	00352309065930	Grey	No	

CHAIN OF CUSTODY

COC#: 64941 ALS Laboratory: EP Perth Environmental

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

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP_24

SITE: Stirling GW - SC

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES 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:			

009	0089_MW158	Clear Plastic Bottle - Natural	125 mL	00070821217516	Green	No	
009	0089_MW158	HDPE (no PTFE)	20 mL	00352312003808	Grey	No	
009	0089_MW158	HDPE (no PTFE)	20 mL	00352312004562	Grey	No	
009	0089_MW158	HDPE (no PTFE)	20 mL	00352309065760	Grey	No	
009	0089_MW158	HDPE (no PTFE)	20 mL	00352309066012	Grey	No	
010	0089_MW161	Clear Plastic Bottle - Natural	125 mL	00070821217614	Green	No	
010	0089_MW161	HDPE (no PTFE)	20 mL	00352309065753	Grey	No	
010	0089_MW161	HDPE (no PTFE)	20 mL	00352309066040	Grey	No	
011	0089_MW166	Clear Plastic Bottle - Natural	125 mL	00070821217442	Green	No	
011	0089_MW166	HDPE (no PTFE)	20 mL	00352312004276	Grey	No	
011	0089_MW166	HDPE (no PTFE)	20 mL	00352312004467	Grey	No	
012	0089_MW171	HDPE (no PTFE)	20 mL	00352312004049	Grey	No	
012	0089_MW171	HDPE (no PTFE)	20 mL	00352312003956	Grey	No	
012	0089_MW171	Clear Plastic Bottle - Natural	125 mL	00070821217396	Green	No	

Total Bottle Count: ALS: 40, Non ALS: 0

SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : **EP2403226**

Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: Customer Services EP
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
E-mail	: [redacted]stantec.com	E-mail	: ALSEnviro.Perth@alsglobal.com
Telephone	: ----	Telephone	: +61-8-9406 1301
Facsimile	: ----	Facsimile	: +61-8-9406 1399
Project	: WA_0089_PFASOMP_24	Page	: 1 of 2
Order number	: pfas-omp/Stirling	Quote number	: ES2022MWHAUS0002 (SY/139/19 B)
C-O-C number	: 64941	QC Level	: NEPM 2013 B3 & ALS QC Standard
Site	: Stirling GW - SC		
Sampler	: [redacted]		

Dates

Date Samples Received	: 13-Mar-2024 12:15	Issue Date	: 15-Mar-2024
Client Requested Due Date	: 22-Mar-2024	Scheduled Reporting Date	: **22-Mar-2024**

Delivery Details

Mode of Delivery	: Carrier	Security Seal	: Not Available
No. of coolers/boxes	: 2	Temperature	: 14.9 - Ice present
Receipt Detail	:	No. of samples received / analysed	: 12 / 12

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 see scanned COC for sample discrepencies: extra samples , samples not received etc.
- Please direct any queries related to sample condition / numbering / breakages to Sample Receipt (Samples.Perth@alsglobal.com)
- Analytical work for this work order will be conducted at ALS Environmental Perth.
- Please direct any turnaround / technical queries to the laboratory contact designated above.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months) from receipt of samples.
- **pH analysis should be conducted within 6 hours of sampling.**
- **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.**
- 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)	WATER - NT-01 & 02 Ca, Mg, Na, K, Cl, SO4, Alkalinity
EP2403226-001	12-Mar-2024 08:48	0089_MW228_240312	✓	✓
EP2403226-002	12-Mar-2024 08:49	0089_QC113_240312	✓	✓
EP2403226-003	12-Mar-2024 08:49	0089_MW227_240312	✓	✓
EP2403226-004	12-Mar-2024 10:18	0089_MW226_240312	✓	✓
EP2403226-005	12-Mar-2024 12:16	0089_MW225_240312	✓	✓
EP2403226-006	12-Mar-2024 12:17	0089_QC118_240312	✓	✓
EP2403226-007	12-Mar-2024 12:23	0089_MW216_240312	✓	✓
EP2403226-008	12-Mar-2024 13:28	0089_MW196_240312	✓	✓
EP2403226-009	12-Mar-2024 13:37	0089_MW158_240312	✓	✓
EP2403226-010	12-Mar-2024 13:57	0089_MW161_240312	✓	✓
EP2403226-011	12-Mar-2024 15:15	0089_MW166_240312	✓	✓
EP2403226-012	12-Mar-2024 15:16	0089_MW171_240312	✓	✓

Proactive Holding Time Report

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

Requested Deliverables

[redacted]
- A4 - AU Tax Invoice (INV) — Email — [redacted]cardno.com.au

DERP LAB REPORTS
- *AU Certificate of Analysis - NATA (COA) — Email — derp.labreports@esdat.com.au
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI) — Email — derp.labreports@esdat.com.au
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC) — Email — derp.labreports@esdat.com.au
- A4 - AU Sample Receipt Notification - Environmental HT (SRN) — Email — derp.labreports@esdat.com.au
- Chain of Custody (CoC) (COC) — Email — derp.labreports@esdat.com.au
- EDI Format - ESDAT (ESDAT) — Email — derp.labreports@esdat.com.au
- EDI Format - XTab (XTAB) — Email — derp.labreports@esdat.com.au

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

CERTIFICATE OF ANALYSIS

Work Order	: **EP2403226**	Page	: 1 of 12
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: Customer Services EP
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: +61-8-9406 1301
Project	: WA_0089_PFASOMP_24	Date Samples Received	: 13-Mar-2024 12:15
Order number	: pfas-omp/Stirling	Date Analysis Commenced	: 15-Mar-2024
C-O-C number	: 64941	Issue Date	: 25-Mar-2024 18:59
Sampler	: [redacted]		
Site	: Stirling GW - SC		
Quote number	: SY/139/19 B		
No. of samples received	: 12		
No. of samples analysed	: 12		

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]	Inorganics Supervisor	Perth Inorganics, Wangara, WA
[redacted]	Senior Organic Chemist	Perth Organics, Wangara, WA

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.
- As per QWI – EN55-3 Data Interpreting Procedures, Ionic balances are typically calculated using Major Anions - Chloride, Alkalinity and Sulfate; and Major Cations - Calcium, Magnesium, Potassium and Sodium. Where applicable and dependent upon sample matrix, the Ionic Balance may also include the additional contribution of Ammonia, Dissolved Metals by ICPMS and H+ to the Cations and Nitrate, SiO2 and Fluoride to the Anions.
- EP231X: Poor duplicate precision for PFOS on sample EP2403250-003 due to possible sample heterogeneity between provided bottles. Confirmed by re-extraction and re-analysis of both sample and duplicate.
- ED037-P (Alkalinity) Sample EP2403226-8 was filtered prior to analysis due to possible sample matrix interference. The sample was observed to contain fine particulate that may consume additional titrant.
- Sodium Adsorption Ratio (where reported): Where results for Na, Ca or Mg are <LOR, a concentration at half the reported LOR is incorporated into the SAR calculation. This represents a conservative approach for Na relative to the assumption that <LOR = zero concentration and a conservative approach for Ca & Mg relative to the assumption that <LOR is equivalent to the LOR concentration.
- 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.
- ED045G: The presence of Thiocyanate, Thiosulfate and Sulfite can positively contribute to the chloride result, thereby may bias results higher than expected. Results should be scrutinised accordingly.

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW228_240312	0089_QC113_240312	0089_MW227_240312	0089_MW226_240312	0089_MW225_240312
				Sampling date / time	12-Mar-2024 08:48	12-Mar-2024 08:49	12-Mar-2024 08:49	12-Mar-2024 10:18	12-Mar-2024 12:16
Compound	CAS Number	LOR	Unit		EP2403226-001	EP2403226-002	EP2403226-003	EP2403226-004	EP2403226-005
					Result	Result	Result	Result	Result
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	<1	<1	<1	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	<1	<1	<1	<1
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		**749**	**691**	**426**	**630**	**450**
Total Alkalinity as CaCO3	----	1	mg/L		**749**	**691**	**426**	**630**	**450**
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		**628**	**634**	**242**	**2210**	**83**
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		**3000**	**3320**	**654**	**14900**	**860**
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		**145**	**146**	**113**	**448**	**176**
Magnesium	7439-95-4	1	mg/L		**290**	**299**	**77**	**1220**	**73**
Sodium	7440-23-5	1	mg/L		**1830**	**1980**	**390**	**8550**	**345**
Potassium	7440-09-7	1	mg/L		**109**	**111**	**20**	**561**	**7**
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		**113**	**121**	**32.0**	**479**	**35.0**
ø Total Cations	----	0.01	meq/L		**113**	**121**	**29.4**	**509**	**30.0**
ø Ionic Balance	----	0.01	%		**0.36**	**0.08**	**4.14**	**3.05**	**7.70**
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		**0.33**	**0.33**	<0.02	<0.02	<0.02
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		**0.24**	**0.24**	<0.02	<0.02	<0.02
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		**0.67**	**0.66**	<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

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW228_240312	0089_QC113_240312	0089_MW227_240312	0089_MW226_240312	0089_MW225_240312
				Sampling date / time	12-Mar-2024 08:48	12-Mar-2024 08:49	12-Mar-2024 08:49	12-Mar-2024 10:18	12-Mar-2024 12:16
Compound	CAS Number	LOR	Unit		EP2403226-001	EP2403226-002	EP2403226-003	EP2403226-004	EP2403226-005
					Result	Result	Result	Result	Result
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		**1.7**	**1.6**	<0.1	<0.1	<0.1
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		**7.36**	**5.88**	<0.02	<0.02	<0.02
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		**6.37**	**6.11**	<0.02	<0.02	<0.02
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		**1.47**	**1.44**	<0.02	<0.02	<0.02
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		**0.34**	**0.35**	<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
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									

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW228_240312	0089_QC113_240312	0089_MW227_240312	0089_MW226_240312	0089_MW225_240312
				Sampling date / time	12-Mar-2024 08:48	12-Mar-2024 08:49	12-Mar-2024 08:49	12-Mar-2024 10:18	12-Mar-2024 12:16
Compound	CAS Number	LOR	Unit		EP2403226-001	EP2403226-002	EP2403226-003	EP2403226-004	EP2403226-005
					Result	Result	Result	Result	Result
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
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		**0.81**	**0.82**	<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		**19.3**	**17.4**	<0.01	**0.01**	<0.01
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		**0.67**	**0.66**	<0.01	**0.01**	<0.01
Sum of PFAS (WA DER List)	----	0.01	µg/L		**19.0**	**17.2**	<0.01	**0.01**	<0.01
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**111**	**112**	**109**	**107**	**97.3**
13C8-PFOA	----	0.02	%		**104**	**94.4**	**102**	**108**	**102**

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_QC118_240312	0089_MW216_240312	0089_MW196_240312	0089_MW158_240312	0089_MW161_240312
				Sampling date / time	12-Mar-2024 12:17	12-Mar-2024 12:23	12-Mar-2024 13:28	12-Mar-2024 13:37	12-Mar-2024 13:57
Compound	CAS Number	LOR	Unit		EP2403226-006	EP2403226-007	EP2403226-008	EP2403226-009	EP2403226-010
					Result	Result	Result	Result	Result
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	<1	<1	<1	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	<1	<1	<1	<1
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		419	283	229	448	532
Total Alkalinity as CaCO3	----	1	mg/L		419	283	229	448	532
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		77	127	20	477	204
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		1080	616	36	4060	556
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		190	152	75	205	83
Magnesium	7439-95-4	1	mg/L		94	56	22	336	112
Sodium	7440-23-5	1	mg/L		449	299	26	2240	362
Potassium	7440-09-7	1	mg/L		8	11	2	108	35
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		40.4	25.7	6.01	133	30.6
ø Total Cations	----	0.01	meq/L		37.0	25.5	6.74	138	30.0
ø Ionic Balance	----	0.01	%		4.51	0.38	5.71	1.72	0.92
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		<0.02	0.12	<0.02	<0.02	<0.02
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		<0.02	0.10	<0.02	<0.02	0.02
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		<0.01	0.81	<0.01	<0.01	0.21
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		<0.02	0.03	<0.02	<0.02	0.03
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		<0.01	0.12	<0.01	<0.01	2.74
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_QC118_240312	0089_MW216_240312	0089_MW196_240312	0089_MW158_240312	0089_MW161_240312
				Sampling date / time	12-Mar-2024 12:17	12-Mar-2024 12:23	12-Mar-2024 13:28	12-Mar-2024 13:37	12-Mar-2024 13:57
Compound	CAS Number	LOR	Unit		EP2403226-006	EP2403226-007	EP2403226-008	EP2403226-009	EP2403226-010
					Result	Result	Result	Result	Result
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		<0.1	**3.5**	<0.1	<0.1	<0.1
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		<0.02	**10.7**	<0.02	<0.02	**0.04**
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		<0.02	**7.81**	<0.02	<0.02	**0.05**
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		<0.02	**1.35**	<0.02	<0.02	**0.02**
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		<0.01	**0.10**	<0.01	<0.01	**0.02**
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
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									

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_QC118_240312	0089_MW216_240312	0089_MW196_240312	0089_MW158_240312	0089_MW161_240312
				Sampling date / time	12-Mar-2024 12:17	12-Mar-2024 12:23	12-Mar-2024 13:28	12-Mar-2024 13:37	12-Mar-2024 13:57
Compound	CAS Number	LOR	Unit		EP2403226-006	EP2403226-007	EP2403226-008	EP2403226-009	EP2403226-010
					Result	Result	Result	Result	Result
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
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	**1.73**	<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	**26.4**	<0.01	<0.01	**3.13**
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		<0.01	**0.93**	<0.01	<0.01	**2.95**
Sum of PFAS (WA DER List)	----	0.01	µg/L		<0.01	**26.2**	<0.01	<0.01	**3.08**
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**98.6**	**114**	**105**	**102**	**101**
13C8-PFOA	----	0.02	%		**102**	**106**	**100**	**95.0**	**96.7**

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW166_240312	0089_MW171_240312	----	----	----
				Sampling date / time	12-Mar-2024 15:15	12-Mar-2024 15:16	----	----	----
Compound	CAS Number	LOR	Unit		EP2403226-011	EP2403226-012	--------	--------	--------
					Result	Result	----	----	----
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	<1	----	----	----
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	<1	----	----	----
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		685	517	----	----	----
Total Alkalinity as CaCO3	----	1	mg/L		685	517	----	----	----
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		147	550	----	----	----
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		1180	3820	----	----	----
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		161	183	----	----	----
Magnesium	7439-95-4	1	mg/L		121	335	----	----	----
Sodium	7440-23-5	1	mg/L		621	2110	----	----	----
Potassium	7440-09-7	1	mg/L		59	119	----	----	----
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		50.0	130	----	----	----
ø Total Cations	----	0.01	meq/L		46.5	132	----	----	----
ø Ionic Balance	----	0.01	%		3.64	0.76	----	----	----
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		0.07	0.50	----	----	----
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		0.02	0.29	----	----	----
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		0.47	1.26	----	----	----
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		0.07	0.04	----	----	----
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		4.89	0.03	----	----	----
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	<0.02	----	----	----

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW166_240312	0089_MW171_240312	----	----	----
				Sampling date / time	12-Mar-2024 15:15	12-Mar-2024 15:16	----	----	----
Compound	CAS Number	LOR	Unit		EP2403226-011	EP2403226-012	--------	--------	--------
					Result	Result	----	----	----
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		**0.1**	**0.2**	----	----	----
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		**0.31**	**0.21**	----	----	----
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		**0.30**	**0.74**	----	----	----
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		**0.12**	**0.04**	----	----	----
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		**0.09**	**0.04**	----	----	----
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		**0.04**	<0.02	----	----	----
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		<0.05	<0.05	----	----	----
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L		<0.02	<0.02	----	----	----
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L		<0.05	<0.05	----	----	----
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L		<0.05	<0.05	----	----	----
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L		<0.05	<0.05	----	----	----
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L		<0.05	<0.05	----	----	----
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L		<0.02	<0.02	----	----	----
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L		<0.02	<0.02	----	----	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids									

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW166_240312	0089_MW171_240312	----	----	----
				Sampling date / time	12-Mar-2024 15:15	12-Mar-2024 15:16	----	----	----
Compound	CAS Number	LOR	Unit		EP2403226-011	EP2403226-012	--------	--------	--------
					Result	Result	----	----	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L		<0.05	<0.05	----	----	----
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		**0.07**	<0.05	----	----	----
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		<0.05	<0.05	----	----	----
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L		<0.05	<0.05	----	----	----
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L		**6.55**	**3.35**	----	----	----
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		**5.36**	**1.29**	----	----	----
Sum of PFAS (WA DER List)	----	0.01	µg/L		**6.42**	**3.02**	----	----	----
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**115**	**110**	----	----	----
13C8-PFOA	----	0.02	%		**101**	**101**	----	----	----

Surrogate Control Limits

Sub-Matrix: **GROUNDWATER**		Recovery Limits (%)	
Compound	*CAS Number*	*Low*	*High*
EP231S: PFAS Surrogate			
13C4-PFOS	----	65	140
13C8-PFOA	----	71	133

QUALITY CONTROL REPORT

Work Order	: **EP2403226**	Page	: 1 of 14
Client	: **STANTEC AUSTRALIA PY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: Customer Services EP
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: +61-8-9406 1301
Project	: WA_0089_PFASOMP_24	Date Samples Received	: 13-Mar-2024
Order number	: pfas-omp/Stirling	Date Analysis Commenced	: 15-Mar-2024
C-O-C number	: 64941	Issue Date	: 25-Mar-2024
Sampler	: [redacted]		
Site	: Stirling GW - SC		
Quote number	: SY/139/19 B		
No. of samples received	: 12		
No. of samples analysed	: 12		

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]	Inorganics Supervisor	Perth Inorganics, Wangara, WA
[redacted]	Senior Organic Chemist	Perth Organics, Wangara, WA

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 (%)
ED037P: Alkalinity by PC Titrator (QC Lot: 5665986)									
EP2403224-002	Anonymous	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	112	112	0.0	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	112	112	0.0	0% - 20%
EP2403224-012	Anonymous	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	245	243	0.7	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	245	243	0.7	0% - 20%
ED037P: Alkalinity by PC Titrator (QC Lot: 5671373)									
EP2403218-015	Anonymous	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	460	460	0.0	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	460	460	0.0	0% - 20%
EP2403380-002	Anonymous	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	232	233	0.0	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	232	233	0.0	0% - 20%
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QC Lot: 5666028)									
EP2403216-001	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	41	48	16.4	0% - 20%
EP2403226-005	0089_MW225_240312	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	83	82	1.6	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 (%)*
ED045G: Chloride by Discrete Analyser (QC Lot: 5666029)									
EP2403216-001	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	195	194	0.5	0% - 20%
EP2403226-005	0089_MW225_240312	ED045G: Chloride	16887-00-6	1	mg/L	860	871	1.3	0% - 20%
ED093F: Dissolved Major Cations (QC Lot: 5666294)									
EP2403224-001	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	466	520	10.9	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	1480	1640	10.6	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	11100	12400	11.1	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	591	666	12.0	0% - 20%
EP2403224-011	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	508	507	0.2	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	1590	1560	1.9	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	11900	11700	2.3	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	647	631	2.5	0% - 20%
ED093F: Dissolved Major Cations (QC Lot: 5666295)									
EP2403226-008	0089_MW196_240312	ED093F: Calcium	7440-70-2	1	mg/L	75	78	3.1	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	22	22	0.0	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	26	26	0.0	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	2	2	0.0	No Limit
EP2403250-006	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	513	505	1.5	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	1640	1600	2.5	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	11700	11400	2.0	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	684	663	3.1	0% - 20%
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 5669292)									
EP2403224-005	Anonymous	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
EP2403224-013	Anonymous	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: 5669318)									
EP2403250-003	Anonymous	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	0.75	# 0.35	72.6	0% - 20%
		EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	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 (%)*
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 5669318) - continued									
EP2403250-003	Anonymous	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: 5669341)									
EP2403218-002	Anonymous	EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01 (0.41)*	µg/L	11.6	11.5	0.9	0% - 20%
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01 (0.41)*	µg/L	66.7	60.0	10.5	0% - 20%
		EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	0.24	0.24	0.0	0% - 50%
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	0.24	0.23	0.0	0% - 50%
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	0.41	0.39	5.4	0% - 20%
		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: 5669292)									
EP2403224-005	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
EP2403224-013	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
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 5669318)									
EP2403250-003	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

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: 5669318) - continued									
EP2403250-003	Anonymous	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: 5669341)									
EP2403218-002	Anonymous	EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	1.29	1.30	0.0	0% - 20%
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	0.14	0.14	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	0.64	0.63	1.9	0% - 20%
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	0.18	0.17	6.1	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	2.69	2.59	3.8	0% - 20%
		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: 5669292)									
EP2403224-005	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
EP2403224-013	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

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: 5669292) - continued									
EP2403224-013	Anonymous	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: 5669318)									
EP2403250-003	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
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 5669341)									
EP2403218-002	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: 5669292)									
EP2403224-005	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

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: 5669292) - continued									
EP2403224-005	Anonymous	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
EP2403224-013	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
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 5669318)									
EP2403250-003	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
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 5669341)									
EP2403218-002	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: 5669292)									
EP2403224-005	Anonymous	EP231X: Sum of PFAS	----	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	<0.01	<0.01	0.0	No Limit
EP2403224-013	Anonymous	EP231X: Sum of PFAS	----	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	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 (%)*
EP231P: PFAS Sums (QC Lot: 5669292) - continued									
EP2403224-013	Anonymous	EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	<0.01	<0.01	0.0	No Limit
EP231P: PFAS Sums (QC Lot: 5669318)									
EP2403250-003	Anonymous	EP231X: Sum of PFAS	----	0.01	µg/L	0.81	# 0.39	70.0	0% - 20%
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	0.79	# 0.39	67.8	0% - 20%
		EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	0.81	# 0.39	70.0	0% - 20%
EP231P: PFAS Sums (QC Lot: 5669341)									
EP2403218-002	Anonymous	EP231X: Sum of PFAS	----	0.01 (0.41)*	µg/L	84.1	77.2	8.6	0% - 20%
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01 (0.41)*	µg/L	78.3	71.5	9.1	0% - 20%
		EP231X: Sum of PFAS (WA DER List)	----	0.01 (0.41)*	µg/L	80.8	74.0	8.8	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
ED037P: Alkalinity by PC Titrator (QCLot: 5665986)								
ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	----	----	----	----
ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	----	----	----	----
ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	<1	----	----	----	----
ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	<1	20 mg/L	96.6	85.1	126
				<1	200 mg/L	101	90.5	111
ED037P: Alkalinity by PC Titrator (QCLot: 5671373)								
ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	----	----	----	----
ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	----	----	----	----
ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	<1	----	----	----	----
ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	<1	20 mg/L	96.6	85.1	126
				<1	200 mg/L	102	90.5	111
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 5666028)								
ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<1	25 mg/L	104	89.9	112
				<1	500 mg/L	102	89.9	112
ED045G: Chloride by Discrete Analyser (QCLot: 5666029)								
ED045G: Chloride	16887-00-6	1	mg/L	<1	10 mg/L	101	88.6	113
				<1	1000 mg/L	102	88.6	113
ED093F: Dissolved Major Cations (QCLot: 5666294)								
ED093F: Calcium	7440-70-2	1	mg/L	<1	50 mg/L	101	86.5	117
ED093F: Magnesium	7439-95-4	1	mg/L	<1	50 mg/L	100	88.4	110
ED093F: Sodium	7440-23-5	1	mg/L	<1	50 mg/L	98.2	91.4	113
ED093F: Potassium	7440-09-7	1	mg/L	<1	50 mg/L	96.0	84.6	108
ED093F: Dissolved Major Cations (QCLot: 5666295)								
ED093F: Calcium	7440-70-2	1	mg/L	<1	50 mg/L	100	86.5	117
ED093F: Magnesium	7439-95-4	1	mg/L	<1	50 mg/L	99.8	88.4	110
ED093F: Sodium	7440-23-5	1	mg/L	<1	50 mg/L	98.9	91.4	113
ED093F: Potassium	7440-09-7	1	mg/L	<1	50 mg/L	96.1	84.6	108
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5669292)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.2218 µg/L	100	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
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5669292) - continued								
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.2352 µg/L	99.3	71.0	127
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	0.2373 µg/L	92.9	68.0	131
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.238 µg/L	93.3	69.0	134
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.232 µg/L	94.2	65.0	140
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.241 µg/L	96.3	53.0	142
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5669318)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.2218 µg/L	99.2	72.0	130
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.2352 µg/L	93.8	71.0	127
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	0.2373 µg/L	95.4	68.0	131
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.238 µg/L	92.4	69.0	134
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.232 µg/L	89.4	65.0	140
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.241 µg/L	89.0	53.0	142
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5669341)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.2218 µg/L	94.4	72.0	130
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.2352 µg/L	91.6	71.0	127
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	0.2373 µg/L	93.8	68.0	131
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.238 µg/L	87.0	69.0	134
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.232 µg/L	102	65.0	140
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.241 µg/L	91.1	53.0	142
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5669292)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	1.25 µg/L	107	73.0	129
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	0.25 µg/L	100	72.0	129
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	0.25 µg/L	99.2	72.0	129
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	0.25 µg/L	98.4	72.0	130
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	0.25 µg/L	115	71.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	0.25 µg/L	105	69.0	130
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	0.25 µg/L	105	71.0	129
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	0.25 µg/L	111	69.0	133
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	0.25 µg/L	100	72.0	134
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	0.25 µg/L	110	65.0	144
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	0.25 µg/L	124	71.0	132
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5669318)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	1.25 µg/L	105	73.0	129
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	0.25 µg/L	92.8	72.0	129

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: 5669318) - continued								
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	0.25 µg/L	99.2	72.0	129
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	0.25 µg/L	97.6	72.0	130
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	0.25 µg/L	96.6	71.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	0.25 µg/L	109	69.0	130
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	0.25 µg/L	94.4	71.0	129
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	0.25 µg/L	93.8	69.0	133
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	0.25 µg/L	96.2	72.0	134
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	0.25 µg/L	93.0	65.0	144
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	0.25 µg/L	111	71.0	132
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5669341)								
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	93.6	72.0	129
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	0.25 µg/L	103	72.0	129
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	0.25 µg/L	96.8	72.0	130
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	0.25 µg/L	99.2	71.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	0.25 µg/L	109	69.0	130
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	0.25 µg/L	91.0	71.0	129
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	0.25 µg/L	102	69.0	133
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	0.25 µg/L	84.8	72.0	134
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	0.25 µg/L	89.8	65.0	144
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	0.25 µg/L	121	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5669292)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.25 µg/L	114	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	0.625 µg/L	110	68.0	141
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	0.625 µg/L	126	60.5	138
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	0.625 µg/L	105	68.3	134
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	0.625 µg/L	108	62.2	138
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	0.25 µg/L	108	65.0	136
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	0.25 µg/L	108	61.0	135
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5669318)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.25 µg/L	106	67.0	137

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
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5669318) - continued								
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	0.625 µg/L	103	68.0	141
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	0.625 µg/L	102	60.5	138
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	0.625 µg/L	105	68.3	134
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	0.625 µg/L	92.7	62.2	138
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	0.25 µg/L	110	65.0	136
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	0.25 µg/L	73.2	61.0	135
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5669341)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.25 µg/L	108	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	0.625 µg/L	94.6	68.0	141
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	0.625 µg/L	91.2	60.5	138
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	0.625 µg/L	106	68.3	134
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	0.625 µg/L	99.3	62.2	138
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	0.25 µg/L	96.8	65.0	136
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	0.25 µg/L	67.4	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5669292)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.2343 µg/L	103	63.0	143
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	0.2378 µg/L	109	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	0.24 µg/L	105	67.0	138
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	0.241 µg/L	90.2	64.2	133
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5669318)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.2343 µg/L	110	63.0	143
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	0.2378 µg/L	112	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	0.24 µg/L	111	67.0	138
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	0.241 µg/L	91.5	64.2	133
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5669341)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.2343 µg/L	108	63.0	143
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	0.2378 µg/L	111	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	0.24 µg/L	110	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: 5669341) - continued								
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	0.241 µg/L	89.2	64.2	133
EP231P: PFAS Sums (QCLot: 5669292)								
EP231X: Sum of PFAS	----	0.01	µg/L	<0.01	----	----	----	----
EP231X: Sum of PFHxS and PFOS	355-46-4/17 63-23-1	0.01	µg/L	<0.01	----	----	----	----
EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	<0.01	----	----	----	----
EP231P: PFAS Sums (QCLot: 5669318)								
EP231X: Sum of PFAS	----	0.01	µg/L	<0.01	----	----	----	----
EP231X: Sum of PFHxS and PFOS	355-46-4/17 63-23-1	0.01	µg/L	<0.01	----	----	----	----
EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	<0.01	----	----	----	----
EP231P: PFAS Sums (QCLot: 5669341)								
EP231X: Sum of PFAS	----	0.01	µg/L	<0.01	----	----	----	----
EP231X: Sum of PFHxS and PFOS	355-46-4/17 63-23-1	0.01	µg/L	<0.01	----	----	----	----
EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	<0.01	----	----	----	----

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
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 5666028)							
EP2403216-001	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	100 mg/L	92.0	70.4	130
ED045G: Chloride by Discrete Analyser (QCLot: 5666029)							
EP2403216-001	Anonymous	ED045G: Chloride	16887-00-6	200 mg/L	112	70.0	130
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5669292)							
EP2403224-007	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.2218 µg/L	99.0	72.0	129
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.232 µg/L	98.2	71.0	127
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.2352 µg/L	89.7	68.0	129
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.238 µg/L	90.1	69.0	134
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.232 µg/L	92.3	65.0	140
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.241 µg/L	91.9	53.0	129
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5669292)							

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: 5669292) - continued							
EP2403224-007	Anonymous	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	1.25 µg/L	105	73.0	142
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.25 µg/L	115	72.0	129
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.25 µg/L	96.2	72.0	129
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.25 µg/L	92.8	72.0	130
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.25 µg/L	108	71.0	133
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.25 µg/L	100	69.0	130
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.25 µg/L	102	71.0	134
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.25 µg/L	111	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	93.4	65.0	144
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.25 µg/L	114	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5669292)							
EP2403224-007	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.25 µg/L	113	59.0	135
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.625 µg/L	112	70.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.625 µg/L	93.4	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.625 µg/L	109	70.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.625 µg/L	103	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.25 µg/L	123	65.0	136
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.25 µg/L	92.4	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5669292)							
EP2403224-007	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.234 µg/L	95.1	63.0	143
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.2378 µg/L	101	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.24 µg/L	113	67.0	138
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.2415 µg/L	96.1	70.0	130

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **EP2403226**	Page	: 1 of 6
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Telephone	: +61-8-9406 1301
Project	: WA_0089_PFASOMP_24	Date Samples Received	: 13-Mar-2024
Site	: Stirling GW - SC	Issue Date	: 25-Mar-2024
Sampler	: [redacted]	No. of samples received	: 12
Order number	: pfas-omp/Stirling	No. of samples analysed	: 12

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 Laboratory Control outliers occur.**
- **NO Matrix Spike outliers occur.**
- **Duplicate outliers exist - please see following pages for full details.**
- **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 : Quality Control Samples

Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

Matrix: **WATER**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
Duplicate (DUP) RPDs							
EP231A: Perfluoroalkyl Sulfonic Acids	EP2403250--003	Anonymous	**Perfluorooctane sulfonic acid (PFOS)**	1763-23-1	72.6 %	0% - 20%	**RPD exceeds LOR based limits**
EP231P: PFAS Sums	EP2403250--003	Anonymous	**Sum of PFAS**	----	70.0 %	0% - 20%	**RPD exceeds LOR based limits**
EP231P: PFAS Sums	EP2403250--003	Anonymous	**Sum of PFHxS and PFOS**	355-46-4/1763-23-1	67.8 %	0% - 20%	**RPD exceeds LOR based limits**
EP231P: PFAS Sums	EP2403250--003	Anonymous	**Sum of PFAS (WA DER List)**	----	70.0 %	0% - 20%	**RPD exceeds LOR based limits**

Outliers : Frequency of Quality Control Samples

Matrix: **WATER**

Quality Control Sample Type		Count		Rate (%)		Quality Control Specification
Analytical Methods	Method	QC	Regular	Actual	Expected	
Matrix Spikes (MS)						
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	31	3.23	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*			*Analysis*		
		Date extracted	*Due for extraction*	*Evaluation*	***Date analysed***	*Due for analysis*	*Evaluation*
ED037P: Alkalinity by PC Titrator							
Clear Plastic Bottle - Natural (ED037-P) 0089_MW228_240312, 0089_QC113_240312, 0089_MW227_240312, 0089_MW226_240312, 0089_MW225_240312, 0089_QC118_240312, 0089_MW216_240312	**12-Mar-2024**	**----**	----	----	**18-Mar-2024**	26-Mar-2024	✓
Clear Plastic Bottle - Natural (ED037-P) 0089_MW196_240312, 0089_MW158_240312, 0089_MW161_240312, 0089_MW166_240312, 0089_MW171_240312	**12-Mar-2024**	**----**	----	----	**19-Mar-2024**	26-Mar-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
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA							
Clear Plastic Bottle - Natural (ED041G)							
0089_MW228_240312, 0089_QC113_240312, 0089_MW227_240312, 0089_MW226_240312, 0089_MW225_240312, 0089_QC118_240312, 0089_MW216_240312, 0089_MW196_240312, 0089_MW158_240312, 0089_MW161_240312, 0089_MW166_240312, 0089_MW171_240312	**12-Mar-2024**	**----**	----	----	**23-Mar-2024**	09-Apr-2024	✓
ED045G: Chloride by Discrete Analyser							
Clear Plastic Bottle - Natural (ED045G)							
0089_MW228_240312, 0089_QC113_240312, 0089_MW227_240312, 0089_MW226_240312, 0089_MW225_240312, 0089_QC118_240312, 0089_MW216_240312, 0089_MW196_240312, 0089_MW158_240312, 0089_MW161_240312, 0089_MW166_240312, 0089_MW171_240312	**12-Mar-2024**	**----**	----	----	**23-Mar-2024**	09-Apr-2024	✓
ED093F: Dissolved Major Cations							
Clear Plastic Bottle - Natural (ED093F)							
0089_MW228_240312, 0089_QC113_240312, 0089_MW227_240312, 0089_MW226_240312, 0089_MW225_240312, 0089_QC118_240312, 0089_MW216_240312, 0089_MW196_240312, 0089_MW158_240312, 0089_MW161_240312, 0089_MW166_240312, 0089_MW171_240312	**12-Mar-2024**	**----**	----	----	**19-Mar-2024**	19-Mar-2024	✓
EP231A: Perfluoroalkyl Sulfonic Acids							
HDPE (no PTFE) (EP231X)							
0089_MW216_240312, 0089_MW166_240312, 0089_MW171_240312	**12-Mar-2024**	**18-Mar-2024**	08-Sep-2024	✓	**18-Mar-2024**	08-Sep-2024	✓
HDPE (no PTFE) (EP231X)							
0089_MW228_240312, 0089_QC113_240312, 0089_MW227_240312, 0089_MW226_240312, 0089_MW225_240312, 0089_QC118_240312, 0089_MW196_240312, 0089_MW158_240312, 0089_MW161_240312	**12-Mar-2024**	**18-Mar-2024**	08-Sep-2024	✓	**19-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)								
0089_MW216_240312, 0089_MW171_240312	0089_MW166_240312,	**12-Mar-2024**	**18-Mar-2024**	08-Sep-2024	✓	**18-Mar-2024**	08-Sep-2024	✓
HDPE (no PTFE) (EP231X)								
0089_MW228_240312, 0089_MW227_240312, 0089_MW225_240312, 0089_MW196_240312, 0089_MW161_240312	0089_QC113_240312, 0089_MW226_240312, 0089_QC118_240312, 0089_MW158_240312,	**12-Mar-2024**	**18-Mar-2024**	08-Sep-2024	✓	**19-Mar-2024**	08-Sep-2024	✓
EP231C: Perfluoroalkyl Sulfonamides								
HDPE (no PTFE) (EP231X)								
0089_MW216_240312, 0089_MW171_240312	0089_MW166_240312,	**12-Mar-2024**	**18-Mar-2024**	08-Sep-2024	✓	**18-Mar-2024**	08-Sep-2024	✓
HDPE (no PTFE) (EP231X)								
0089_MW228_240312, 0089_MW227_240312, 0089_MW225_240312, 0089_MW196_240312, 0089_MW161_240312	0089_QC113_240312, 0089_MW226_240312, 0089_QC118_240312, 0089_MW158_240312,	**12-Mar-2024**	**18-Mar-2024**	08-Sep-2024	✓	**19-Mar-2024**	08-Sep-2024	✓
EP231D: (n:2) Fluorotelomer Sulfonic Acids								
HDPE (no PTFE) (EP231X)								
0089_MW216_240312, 0089_MW171_240312	0089_MW166_240312,	**12-Mar-2024**	**18-Mar-2024**	08-Sep-2024	✓	**18-Mar-2024**	08-Sep-2024	✓
HDPE (no PTFE) (EP231X)								
0089_MW228_240312, 0089_MW227_240312, 0089_MW225_240312, 0089_MW196_240312, 0089_MW161_240312	0089_QC113_240312, 0089_MW226_240312, 0089_QC118_240312, 0089_MW158_240312,	**12-Mar-2024**	**18-Mar-2024**	08-Sep-2024	✓	**19-Mar-2024**	08-Sep-2024	✓
EP231P: PFAS Sums								
HDPE (no PTFE) (EP231X)								
0089_MW216_240312, 0089_MW171_240312	0089_MW166_240312,	**12-Mar-2024**	**18-Mar-2024**	08-Sep-2024	✓	**18-Mar-2024**	08-Sep-2024	✓
HDPE (no PTFE) (EP231X)								
0089_MW228_240312, 0089_MW227_240312, 0089_MW225_240312, 0089_MW196_240312, 0089_MW161_240312	0089_QC113_240312, 0089_MW226_240312, 0089_QC118_240312, 0089_MW158_240312,	**12-Mar-2024**	**18-Mar-2024**	08-Sep-2024	✓	**19-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)							
Alkalinity by Auto Titrator	ED037-P	4	40	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	18	**11.11**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	4	31	**12.90**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	4	31	**12.90**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	18	**11.11**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Alkalinity by Auto Titrator	ED037-P	4	40	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	18	**11.11**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	2	31	**6.45**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	3	31	**9.68**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	18	**11.11**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Alkalinity by Auto Titrator	ED037-P	2	40	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	1	18	**5.56**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	2	31	**6.45**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	3	31	**9.68**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	18	**5.56**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Chloride by Discrete Analyser	ED045G	1	18	**5.56**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	31	**3.23**	**5.00**	×	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	18	**5.56**	**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
Alkalinity by Auto Titrator	ED037-P	WATER	In house: Referenced to APHA 2320 B This procedure determines alkalinity by automated measurement (e.g. PC Titrate) on a settled supernatant aliquot of the sample using pH 4.5 for indicating the total alkalinity end-point. This method is compliant with NEPM Schedule B(3)
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	WATER	In house: Referenced to APHA 4500-SO4. Dissolved sulfate is determined in a 0.45um filtered sample. Sulfate ions are converted to a barium sulfate suspension in an acetic acid medium with barium chloride. Light absorbance of the BaSO4 suspension is measured by a photometer and the SO4-2 concentration is determined by comparison of the reading with a standard curve. This method is compliant with NEPM Schedule B(3)
Chloride by Discrete Analyser	ED045G	WATER	In house: Referenced to APHA 4500 Cl - G.The thiocyanate ion is liberated from mercuric thiocyanate through sequestration of mercury by the chloride ion to form non-ionised mercuric chloride. In the presence of ferric ions the liberated thiocynate forms highly-coloured ferric thiocynate which is measured at 480 nm.
Major Cations - Dissolved	ED093F	WATER	In house: Referenced to APHA 3120 and 3125; USEPA SW 846 - 6010 and 6020; Cations are determined by either ICP-AES or ICP-MS techniques. This method is compliant with NEPM Schedule B(3) Sodium Adsorption Ratio is calculated from Ca, Mg and Na which determined by ALS in house method QWI-EN/ED093F. This method is compliant with NEPM Schedule B(3) Hardness parameters are calculated based on APHA 2340 B. This method is compliant with NEPM Schedule B(3)
Ionic Balance by PCT DA and Turbi SO4 DA	* EN055 - PG	WATER	In house: Referenced to APHA 1030F. This method is compliant with NEPM Schedule B(3)
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.

ALSCompass
SAMPLING *Intelligence*

ALS

Environmental Division
Perth
Work Order Reference
EP2403250

Telephone - 61-8-9406 1301

Custody Document for Submissions via ALS Compass App

Project: WA_0089_PFASOMP_24 **Client:** Stantec

Project Manager: [redacted]
Phone: [redacted]

ALS Compass COC Reference: 64954; 64944; 64940; 64939; 64941; 64947; 64949 **# Samples:**

Sampler: [redacted]
Phone: [redacted]

Turnaround Requirements: Standard Urgent

Special Instructions:

Custody:

Relinquished by:	Received by:	Relinquished by:	Received by:
[redacted]	[redacted]		
Date / Time: 12/3/24 - 3:09pm	Date / Time: 13/3 1215	Date / Time:	Date / Time:

CHAIN OF CUSTODY

ALS COC#: 64947 ALS Laboratory: EP Perth Environmental

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP_24

SITE: Stirling SW/PW - CG

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted]

SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO: [redacted]

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME: 13/3 1215	DATE TIME:	DATE TIME:

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	WA OMP Water Suite WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
001	0089_SW371		12/03/2024 09:23 AM	WATER	ALS: 3 Non ALS: 0	No	X		
002	0089_PW368		12/03/2024 09:32 AM	WATER	ALS: 3 Non ALS: 0	No	X		
003	0089_SW305		12/03/2024 09:43 AM	WATER	ALS: 5 Non ALS: 0	No	X		
004	0089_QC112		12/03/2024 09:45 AM	WATER	ALS: 3 Non ALS: 0	No	X		
005	0089_PW304		12/03/2024 09:57 AM	WATER	ALS: 3 Non ALS: 0	No	X		
006	0089_QC111		12/03/2024 09:59 AM	WATER	ALS: 3 Non ALS: 0	No	X		

CHAIN OF CUSTODY

(ALS) COC#: **64947** *ALS Laboratory:* EP Perth Environmental

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

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP_24

SITE: Stirling SW/PW - CG

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO:

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	0089_SW371	Clear Plastic Bottle - Natural	125 mL	00070821217312	Green	No	
001	0089_SW371	HDPE (no PTFE)	20 mL	00352309065963	Grey	No	
001	0089_SW371	HDPE (no PTFE)	20 mL	00352309065820	Grey	No	
002	0089_PW368	HDPE (no PTFE)	20 mL	00352309065899	Grey	No	
002	0089_PW368	HDPE (no PTFE)	20 mL	00352309065907	Grey	No	
002	0089_PW368	Clear Plastic Bottle - Natural	125 mL	00070821217402	Green	No	
003	0089_SW305	HDPE (no PTFE)	20 mL	00352312004524	Grey	No	
003	0089_SW305	HDPE (no PTFE)	20 mL	00352312004614	Grey	No	
003	0089_SW305	Clear Plastic Bottle - Natural	125 mL	00070821217602	Green	No	
003	0089_SW305	HDPE (no PTFE)	20 mL	00352309065795	Grey	No	
003	0089_SW305	HDPE (no PTFE)	20 mL	00352309065957	Grey	No	
004	0089_QC112	Clear Plastic Bottle - Natural	125 mL	00070821217412	Green	No	
004	0089_QC112	HDPE (no PTFE)	20 mL	00352309065785	Grey	No	
004	0089_QC112	HDPE (no PTFE)	20 mL	00352309065764	Grey	No	
005	0089_PW304	Clear Plastic Bottle - Natural	125 mL	00070821217529	Green	No	
005	0089_PW304	HDPE (no PTFE)	20 mL	00352309065990	Grey	No	
005	0089_PW304	HDPE (no PTFE)	20 mL	00352309066030	Grey	No	
006	0089_QC111	Clear Plastic Bottle - Natural	125 mL	00070821217617	Green	No	
006	0089_QC111	HDPE (no PTFE)	20 mL	00352309066017	Grey	No	
006	0089_QC111	HDPE (no PTFE)	20 mL	00352309065792	Grey	No	

Total Bottle Count: ALS: 20, Non ALS: 0

SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : **EP2403250**

Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: Customer Services EP
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
E-mail	: [redacted]stantec.com	E-mail	: ALSEnviro.Perth@alsglobal.com
Telephone	: ----	Telephone	: +61-8-9406 1301
Facsimile	: ----	Facsimile	: +61-8-9406 1399
Project	: WA_0089_PFASOMP_24	Page	: 1 of 2
Order number	: pfas-omp/Stirling	Quote number	: ES2022MWHAUS0002 (SY/139/19 B)
C-O-C number	: 64947	QC Level	: NEPM 2013 B3 & ALS QC Standard
Site	: Stirling SW/PW - CG		
Sampler	: [redacted]		

Dates

Date Samples Received	: 13-Mar-2024 12:15	Issue Date	: 15-Mar-2024
Client Requested Due Date	: 22-Mar-2024	Scheduled Reporting Date	: **22-Mar-2024**

Delivery Details

Mode of Delivery	: Carrier	Security Seal	: Not Available
No. of coolers/boxes	: 2	Temperature	: 14.9 - Ice present
Receipt Detail	:	No. of samples received / analysed	: 6 / 6

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 see scanned COC for sample discrepencies: extra samples , samples not received etc.
- Please direct any queries related to sample condition / numbering / breakages to Sample Receipt (Samples.Perth@alsglobal.com)
- Analytical work for this work order will be conducted at ALS Environmental Perth.
- Please direct any turnaround / technical queries to the laboratory contact designated above.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months) from receipt of samples.
- **pH analysis should be conducted within 6 hours of sampling.**
- **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.**
- 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)	WATER - NT-01 & 02 Ca, Mg, Na, K, Cl, SO4, Alkalinity
EP2403250-001	12-Mar-2024 09:23	0089_SW371_240312	✓	✓
EP2403250-002	12-Mar-2024 09:32	0089_PW368_240312	✓	✓
EP2403250-003	12-Mar-2024 09:43	0089_SW305_240312	✓	✓
EP2403250-004	12-Mar-2024 09:45	0089_QC112_240312	✓	✓
EP2403250-005	12-Mar-2024 09:57	0089_PW304_240312	✓	✓
EP2403250-006	12-Mar-2024 09:59	0089_QC111_240312	✓	✓

Proactive Holding Time Report

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

Requested Deliverables

[redacted]
- A4 - AU Tax Invoice (INV) — Email — [redacted]cardno.com.au

DERP LAB REPORTS
- *AU Certificate of Analysis - NATA (COA) — Email — derp.labreports@esdat.com.au
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI) — Email — derp.labreports@esdat.com.au
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC) — Email — derp.labreports@esdat.com.au
- A4 - AU Sample Receipt Notification - Environmental HT (SRN) — Email — derp.labreports@esdat.com.au
- Chain of Custody (CoC) (COC) — Email — derp.labreports@esdat.com.au
- EDI Format - ESDAT (ESDAT) — Email — derp.labreports@esdat.com.au
- EDI Format - XTab (XTAB) — Email — derp.labreports@esdat.com.au

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

CERTIFICATE OF ANALYSIS

Work Order	: **EP2403250**	Page	: 1 of 9
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: Customer Services EP
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: +61-8-9406 1301
Project	: WA_0089_PFASOMP_24	Date Samples Received	: 13-Mar-2024 12:15
Order number	: pfas-omp/Stirling	Date Analysis Commenced	: 15-Mar-2024
C-O-C number	: 64947	Issue Date	: 25-Mar-2024 22:31
Sampler	: [redacted] [redacted]		
Site	: Stirling SW/PW - CG		
Quote number	: SY/139/19 B		
No. of samples received	: 6		
No. of samples analysed	: 6		

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]	Inorganics Supervisor	Perth Inorganics, Wangara, WA
[redacted]	Senior Organic Chemist	Perth Organics, Wangara, WA

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.
- As per QWI – EN55-3 Data Interpreting Procedures, Ionic balances are typically calculated using Major Anions - Chloride, Alkalinity and Sulfate; and Major Cations - Calcium, Magnesium, Potassium and Sodium. Where applicable and dependent upon sample matrix, the Ionic Balance may also include the additional contribution of Ammonia, Dissolved Metals by ICPMS and H+ to the Cations and Nitrate, SiO2 and Fluoride to the Anions.
- EP231X: Poor duplicate precision for PFOS on sample EP2403250-003 due to possible sample heterogeneity between provided bottles. Confirmed by re-extraction and re-analysis of both sample and duplicate.
- Sodium Adsorption Ratio (where reported): Where results for Na, Ca or Mg are <LOR, a concentration at half the reported LOR is incorporated into the SAR calculation. This represents a conservative approach for Na relative to the assumption that <LOR = zero concentration and a conservative approach for Ca & Mg relative to the assumption that <LOR is equivalent to the LOR concentration.
- 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.
- ED045G: The presence of Thiocyanate, Thiosulfate and Sulfite can positively contribute to the chloride result, thereby may bias results higher than expected. Results should be scrutinised accordingly.

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_SW371_240312	0089_PW368_240312	0089_SW305_240312	0089_QC112_240312	0089_PW304_240312
				Sampling date / time	12-Mar-2024 09:23	12-Mar-2024 09:32	12-Mar-2024 09:43	12-Mar-2024 09:45	12-Mar-2024 09:57
Compound	CAS Number	LOR	Unit		EP2403250-001	EP2403250-002	EP2403250-003	EP2403250-004	EP2403250-005
					Result	Result	Result	Result	Result
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	<1	<1	<1	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	<1	<1	<1	<1
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		156	204	201	171	208
Total Alkalinity as CaCO3	----	1	mg/L		156	204	201	171	208
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		2550	3060	2530	2530	2890
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		18600	21500	19000	18300	20800
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		496	572	483	478	520
Magnesium	7439-95-4	1	mg/L		1570	1780	1480	1490	1640
Sodium	7440-23-5	1	mg/L		11600	13400	11200	11200	12300
Potassium	7440-09-7	1	mg/L		638	733	619	605	667
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		581	674	593	572	651
ø Total Cations	----	0.01	meq/L		675	777	649	649	713
ø Ionic Balance	----	0.01	%		7.48	7.06	4.53	6.29	4.54
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	<0.01	0.04	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		0.07	0.10	0.75	0.16	0.04
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_SW371_240312	0089_PW368_240312	0089_SW305_240312	0089_QC112_240312	0089_PW304_240312
				Sampling date / time	12-Mar-2024 09:23	12-Mar-2024 09:32	12-Mar-2024 09:43	12-Mar-2024 09:45	12-Mar-2024 09:57
Compound	CAS Number	LOR	Unit		EP2403250-001	EP2403250-002	EP2403250-003	EP2403250-004	EP2403250-005
					Result	Result	Result	Result	Result
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
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									

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_SW371_240312	0089_PW368_240312	0089_SW305_240312	0089_QC112_240312	0089_PW304_240312
				Sampling date / time	12-Mar-2024 09:23	12-Mar-2024 09:32	12-Mar-2024 09:43	12-Mar-2024 09:45	12-Mar-2024 09:57
Compound	CAS Number	LOR	Unit		EP2403250-001	EP2403250-002	EP2403250-003	EP2403250-004	EP2403250-005
					Result	Result	Result	Result	Result
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
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		**0.09**	**0.10**	**0.81**	**0.19**	**0.04**
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		**0.09**	**0.10**	**0.79**	**0.19**	**0.04**
Sum of PFAS (WA DER List)	----	0.01	µg/L		**0.09**	**0.10**	**0.81**	**0.19**	**0.04**
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**109**	**114**	**116**	**107**	**112**
13C8-PFOA	----	0.02	%		**105**	**99.5**	**103**	**104**	**108**

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_QC111_240312	----	----	----	----
				Sampling date / time	12-Mar-2024 09:59	----	----	----	----
Compound	CAS Number	LOR	Unit		EP2403250-006	--------	--------	--------	--------
					Result	----	----	----	----
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	----	----	----	----
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	----	----	----	----
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		**208**	----	----	----	----
Total Alkalinity as CaCO3	----	1	mg/L		**208**	----	----	----	----
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		**2900**	----	----	----	----
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		**20800**	----	----	----	----
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		**513**	----	----	----	----
Magnesium	7439-95-4	1	mg/L		**1640**	----	----	----	----
Sodium	7440-23-5	1	mg/L		**11700**	----	----	----	----
Potassium	7440-09-7	1	mg/L		**684**	----	----	----	----
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		**651**	----	----	----	----
ø Total Cations	----	0.01	meq/L		**687**	----	----	----	----
ø Ionic Balance	----	0.01	%		**2.67**	----	----	----	----
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		**0.05**	----	----	----	----
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	----	----	----	----

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_QC111_240312	----	----	----	----
				Sampling date / time	12-Mar-2024 09:59	----	----	----	----
Compound	CAS Number	LOR	Unit		EP2403250-006	--------	--------	--------	--------
					Result	----	----	----	----
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	----	----	----	----
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									

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_QC111_240312	----	----	----	----
				Sampling date / time	12-Mar-2024 09:59	----	----	----	----
Compound	CAS Number	LOR	Unit		EP2403250-006	--------	--------	--------	--------
					Result	----	----	----	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
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		**0.05**	----	----	----	----
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		**0.05**	----	----	----	----
Sum of PFAS (WA DER List)	----	0.01	µg/L		**0.05**	----	----	----	----
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**119**	----	----	----	----
13C8-PFOA	----	0.02	%		**106**	----	----	----	----

Surrogate Control Limits

Sub-Matrix: SURFACE WATER		Recovery Limits (%)	
Compound	CAS Number	Low	High
EP231S: PFAS Surrogate			
13C4-PFOS	----	65	140
13C8-PFOA	----	71	133

QUALITY CONTROL REPORT

Work Order	: **EP2403250**	Page	: 1 of 7
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: Customer Services EP
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: +61-8-9406 1301
Project	: WA_0089_PFASOMP_24	Date Samples Received	: 13-Mar-2024
Order number	: pfas-omp/Stirling	Date Analysis Commenced	: 15-Mar-2024
C-O-C number	: 64947	Issue Date	: 25-Mar-2024
Sampler	: [redacted]		
Site	: Stirling SW/PW - CG		
Quote number	: SY/139/19 B		
No. of samples received	: 6		
No. of samples analysed	: 6		

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]	Inorganics Supervisor	Perth Inorganics, Wangara, WA
[redacted]	Senior Organic Chemist	Perth Organics, Wangara, WA

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 (%)
ED037P: Alkalinity by PC Titrator (QC Lot: 5671373)									
EP2403218-015	Anonymous	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	460	460	0.0	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	460	460	0.0	0% - 20%
EP2403380-002	Anonymous	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	232	233	0.0	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	232	233	0.0	0% - 20%
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QC Lot: 5666575)									
EP2403250-001	0089_SW371_240312	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	2550	2600	2.0	0% - 20%
EP2403371-033	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	204	183	10.9	0% - 20%
ED045G: Chloride by Discrete Analyser (QC Lot: 5666576)									
EP2403250-001	0089_SW371_240312	ED045G: Chloride	16887-00-6	1	mg/L	18600	18900	1.3	0% - 20%
EP2403371-033	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	1290	1300	1.0	0% - 20%
ED093F: Dissolved Major Cations (QC Lot: 5666295)									
EP2403226-008	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	75	78	3.1	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	22	22	0.0	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	26	26	0.0	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	2	2	0.0	No Limit
EP2403250-006	0089_QC111_240312	ED093F: Calcium	7440-70-2	1	mg/L	513	505	1.5	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	1640	1600	2.5	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	11700	11400	2.0	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 (%)*
ED093F: Dissolved Major Cations (QC Lot: 5666295) - continued									
EP2403250-006	0089_QC111_240312	ED093F: Potassium	7440-09-7	1	mg/L	684	663	3.1	0% - 20%
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 5669318)									
EP2403250-003	0089_SW305_240312	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	0.75	# 0.35	72.6	0% - 20%
		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: 5669318)									
EP2403250-003	0089_SW305_240312	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: 5669318)									
EP2403250-003	0089_SW305_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
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 5669318)									
EP2403250-003	0089_SW305_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

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: 5669318) - continued									
EP2403250-003	0089_SW305_240312	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: 5669318)									
EP2403250-003	0089_SW305_240312	EP231X: Sum of PFAS	----	0.01	µg/L	0.81	# 0.39	70.0	0% - 20%
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	0.79	# 0.39	67.8	0% - 20%
		EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	0.81	# 0.39	70.0	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
ED037P: Alkalinity by PC Titrator (QCLot: 5671373)								
ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	----	----	----	----
ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	----	----	----	----
ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	<1	----	----	----	----
ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	<1	20 mg/L	96.6	85.1	126
				<1	200 mg/L	102	90.5	111
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 5666575)								
ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<1	25 mg/L	101	89.9	112
				<1	500 mg/L	101	89.9	112
ED045G: Chloride by Discrete Analyser (QCLot: 5666576)								
ED045G: Chloride	16887-00-6	1	mg/L	<1	10 mg/L	102	88.6	113
				<1	1000 mg/L	100	88.6	113
ED093F: Dissolved Major Cations (QCLot: 5666295)								
ED093F: Calcium	7440-70-2	1	mg/L	<1	50 mg/L	100	86.5	117
ED093F: Magnesium	7439-95-4	1	mg/L	<1	50 mg/L	99.8	88.4	110
ED093F: Sodium	7440-23-5	1	mg/L	<1	50 mg/L	98.9	91.4	113
ED093F: Potassium	7440-09-7	1	mg/L	<1	50 mg/L	96.1	84.6	108
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5669318)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.2218 µg/L	99.2	72.0	130
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.2352 µg/L	93.8	71.0	127
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	0.2373 µg/L	95.4	68.0	131
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.238 µg/L	92.4	69.0	134
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.232 µg/L	89.4	65.0	140
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.241 µg/L	89.0	53.0	142
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5669318)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	1.25 µg/L	105	73.0	129
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	0.25 µg/L	92.8	72.0	129
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	0.25 µg/L	99.2	72.0	129
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	0.25 µg/L	97.6	72.0	130
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	0.25 µg/L	96.6	71.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	0.25 µg/L	109	69.0	130

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
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5669318) - continued								
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	0.25 µg/L	94.4	71.0	129
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	0.25 µg/L	93.8	69.0	133
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	0.25 µg/L	96.2	72.0	134
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	0.25 µg/L	93.0	65.0	144
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	0.25 µg/L	111	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5669318)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.25 µg/L	106	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	0.625 µg/L	103	68.0	141
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	0.625 µg/L	102	60.5	138
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	0.625 µg/L	105	68.3	134
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	0.625 µg/L	92.7	62.2	138
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	0.25 µg/L	110	65.0	136
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	0.25 µg/L	73.2	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5669318)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.2343 µg/L	110	63.0	143
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	0.2378 µg/L	112	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	0.24 µg/L	111	67.0	138
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	0.241 µg/L	91.5	64.2	133
EP231P: PFAS Sums (QCLot: 5669318)								
EP231X: Sum of PFAS	----	0.01	µg/L	<0.01	----	----	----	----
EP231X: Sum of PFHxS and PFOS	355-46-4/17 63-23-1	0.01	µg/L	<0.01	----	----	----	----
EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	<0.01	----	----	----	----

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
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 5666575)							
EP2403250-001	0089_SW371_240312						

Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*Concentration*	*MS*	*Low*	*High*
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 5666575) - continued							
EP2403250-001	0089_SW371_240312	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	100 mg/L	# Not Determined	70.4	130
ED045G: Chloride by Discrete Analyser (QCLot: 5666576)							
EP2403250-001	0089_SW371_240312	ED045G: Chloride	16887-00-6	200 mg/L	# Not Determined	70.0	130

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **EP2403250**	Page	: 1 of 5
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Telephone	: +61-8-9406 1301
Project	: WA_0089_PFASOMP_24	Date Samples Received	: 13-Mar-2024
Site	: Stirling SW/PW - CG	Issue Date	: 25-Mar-2024
Sampler	: [redacted]	No. of samples received	: 6
Order number	: pfas-omp/Stirling	No. of samples analysed	: 6

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 Laboratory Control outliers occur.**
- **Duplicate outliers exist - please see following pages for full details.**
- **Matrix Spike outliers exist - please see following pages for full details.**
- **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 : Quality Control Samples

Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

Matrix: **WATER**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
Duplicate (DUP) RPDs							
EP231A: Perfluoroalkyl Sulfonic Acids	EP2403250--003	0089_SW305_240312	**Perfluorooctane sulfonic acid (PFOS)**	1763-23-1	72.6 %	0% - 20%	**RPD exceeds LOR based limits**
EP231P: PFAS Sums	EP2403250--003	0089_SW305_240312	**Sum of PFAS**	----	70.0 %	0% - 20%	**RPD exceeds LOR based limits**
EP231P: PFAS Sums	EP2403250--003	0089_SW305_240312	**Sum of PFHxS and PFOS**	355-46-4/1763-23-1	67.8 %	0% - 20%	**RPD exceeds LOR based limits**
EP231P: PFAS Sums	EP2403250--003	0089_SW305_240312	**Sum of PFAS (WA DER List)**	----	70.0 %	0% - 20%	**RPD exceeds LOR based limits**
Matrix Spike (MS) Recoveries							
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA	EP2403250--001	0089_SW371_240312	**Sulfate as SO4 - Turbidimetric**	14808-79-8	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
ED045G: Chloride by Discrete Analyser	EP2403250--001	0089_SW371_240312	**Chloride**	16887-00-6	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**

Outliers : Frequency of Quality Control Samples

Matrix: **WATER**

Quality Control Sample Type		Count		Rate (%)		Quality Control Specification
Analytical Methods	Method	QC	Regular	Actual	Expected	
Matrix Spikes (MS)						
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	0	8	0.00	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*			*Analysis*		
			Date extracted	*Due for extraction*	*Evaluation*	*Date analysed*	*Due for analysis*	*Evaluation*
ED037P: Alkalinity by PC Titrator								
Clear Plastic Bottle - Natural (ED037-P)								
0089_SW371_240312,	0089_PW368_240312,	**12-Mar-2024**	**----**	----	----	**19-Mar-2024**	26-Mar-2024	✓
0089_SW305_240312,	0089_QC112_240312,							
0089_PW304_240312,	0089_QC111_240312							

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
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA							
Clear Plastic Bottle - Natural (ED041G)							
0089_SW371_240312, 0089_PW368_240312, 0089_SW305_240312, 0089_QC112_240312, 0089_PW304_240312, 0089_QC111_240312	**12-Mar-2024**	**----**	----	----	**23-Mar-2024**	09-Apr-2024	✓
ED045G: Chloride by Discrete Analyser							
Clear Plastic Bottle - Natural (ED045G)							
0089_SW371_240312, 0089_PW368_240312, 0089_SW305_240312, 0089_QC112_240312, 0089_PW304_240312, 0089_QC111_240312	**12-Mar-2024**	**----**	----	----	**23-Mar-2024**	09-Apr-2024	✓
ED093F: Dissolved Major Cations							
Clear Plastic Bottle - Natural (ED093F)							
0089_SW371_240312, 0089_PW368_240312, 0089_SW305_240312, 0089_QC112_240312, 0089_PW304_240312, 0089_QC111_240312	**12-Mar-2024**	**----**	----	----	**19-Mar-2024**	19-Mar-2024	✓
EP231A: Perfluoroalkyl Sulfonic Acids							
HDPE (no PTFE) (EP231X)							
0089_SW371_240312, 0089_PW368_240312, 0089_SW305_240312, 0089_QC112_240312, 0089_PW304_240312, 0089_QC111_240312	**12-Mar-2024**	**18-Mar-2024**	08-Sep-2024	✓	**18-Mar-2024**	08-Sep-2024	✓
EP231B: Perfluoroalkyl Carboxylic Acids							
HDPE (no PTFE) (EP231X)							
0089_SW371_240312, 0089_PW368_240312, 0089_SW305_240312, 0089_QC112_240312, 0089_PW304_240312, 0089_QC111_240312	**12-Mar-2024**	**18-Mar-2024**	08-Sep-2024	✓	**18-Mar-2024**	08-Sep-2024	✓
EP231C: Perfluoroalkyl Sulfonamides							
HDPE (no PTFE) (EP231X)							
0089_SW371_240312, 0089_PW368_240312, 0089_SW305_240312, 0089_QC112_240312, 0089_PW304_240312, 0089_QC111_240312	**12-Mar-2024**	**18-Mar-2024**	08-Sep-2024	✓	**18-Mar-2024**	08-Sep-2024	✓
EP231D: (n:2) Fluorotelomer Sulfonic Acids							
HDPE (no PTFE) (EP231X)							
0089_SW371_240312, 0089_PW368_240312, 0089_SW305_240312, 0089_QC112_240312, 0089_PW304_240312, 0089_QC111_240312	**12-Mar-2024**	**18-Mar-2024**	08-Sep-2024	✓	**18-Mar-2024**	08-Sep-2024	✓
EP231P: PFAS Sums							
HDPE (no PTFE) (EP231X)							
0089_SW371_240312, 0089_PW368_240312, 0089_SW305_240312, 0089_QC112_240312, 0089_PW304_240312, 0089_QC111_240312	**12-Mar-2024**	**18-Mar-2024**	08-Sep-2024	✓	**18-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)							
Alkalinity by Auto Titrator	ED037-P	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	2	11	**18.18**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	8	**12.50**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Alkalinity by Auto Titrator	ED037-P	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	1	11	**9.09**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	8	**12.50**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Alkalinity by Auto Titrator	ED037-P	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	1	11	**9.09**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	8	**12.50**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Chloride by Discrete Analyser	ED045G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	0	8	**0.00**	**5.00**	×	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	20	**5.00**	**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
Alkalinity by Auto Titrator	ED037-P	WATER	In house: Referenced to APHA 2320 B This procedure determines alkalinity by automated measurement (e.g. PC Titrate) on a settled supernatant aliquot of the sample using pH 4.5 for indicating the total alkalinity end-point. This method is compliant with NEPM Schedule B(3)
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	WATER	In house: Referenced to APHA 4500-SO4. Dissolved sulfate is determined in a 0.45um filtered sample. Sulfate ions are converted to a barium sulfate suspension in an acetic acid medium with barium chloride. Light absorbance of the BaSO4 suspension is measured by a photometer and the SO4-2 concentration is determined by comparison of the reading with a standard curve. This method is compliant with NEPM Schedule B(3)
Chloride by Discrete Analyser	ED045G	WATER	In house: Referenced to APHA 4500 Cl - G.The thiocyanate ion is liberated from mercuric thiocyanate through sequestration of mercury by the chloride ion to form non-ionised mercuric chloride. In the presence of ferric ions the liberated thiocynate forms highly-coloured ferric thiocynate which is measured at 480 nm.
Major Cations - Dissolved	ED093F	WATER	In house: Referenced to APHA 3120 and 3125; USEPA SW 846 - 6010 and 6020; Cations are determined by either ICP-AES or ICP-MS techniques. This method is compliant with NEPM Schedule B(3) Sodium Adsorption Ratio is calculated from Ca, Mg and Na which determined by ALS in house method QWI-EN/ED093F. This method is compliant with NEPM Schedule B(3) Hardness parameters are calculated based on APHA 2340 B. This method is compliant with NEPM Schedule B(3)
Ionic Balance by PCT DA and Turbi SO4 DA	* EN055 - PG	WATER	In house: Referenced to APHA 1030F. This method is compliant with NEPM Schedule B(3)
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.

ALSCompass
SAMPLING *Intelligence*

Environmental Division
Perth
Work Order Reference
EP2403295

Telephone +61-8-9406 1301

Custody Document for Submissions via ALS Compass App

Project: WA_00881_PFASOMP_24 **Client:** Stantec **Project Manager:** [redacted]

ALS Compass COC Reference: 65035, 65034, 65032, 65036 **# Samples:** 1 ESKs **Sampler:** [redacted]

Turnaround Requirements: Standard ~~Standard~~ Urgent **Phone:** [redacted]

Special Instructions:

Custody:

Relinquished by: [redacted]	Received by: [redacted]	Relinquished by:	Received by:
Date / Time: 13/3/24	Date / Time: 13/3 1630	Date / Time:	Date / Time:

CHAIN OF CUSTODY

COC#: 65032 ALS Laboratory: EP Perth Environmental

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

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP_24

SITE: Stirling SD - CG

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER:

CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO:

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 Sediments SEDIMENT	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
001	0089_SD369		13/03/2024 08:09 AM	SOIL	ALS: 1 Non ALS: 0	No	X		
002	0089_SD367		13/03/2024 08:10 AM	SOIL	ALS: 1 Non ALS: 0	No	X		
003	0089_SD345		13/03/2024 08:10 AM	SOIL	ALS: 1 Non ALS: 0	No	X		

CHAIN OF CUSTODY

COC#: **65032** *ALS Laboratory:* EP Perth Environmental

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

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP_24

SITE: Stirling SD - CG

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted] SAMPLER MOBILE [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted] derp.labreports@esdat.com.au

EMAIL INVOICES 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	0089_SD369	HDPE Soil Jar	200 mL	00621222089122	Grey	No	
002	0089_SD367	HDPE Soil Jar	200 mL	00621222089098	Grey	No	
003	0089_SD345	HDPE Soil Jar	200 mL	00621222089092	Grey	No	

Total Bottle Count: ALS: 3, Non ALS: 0

SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : **EP2403295**

Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: Customer Services EP
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
E-mail	: [redacted]stantec.com	E-mail	: ALSEnviro.Perth@alsglobal.com
Telephone	: ----	Telephone	: +61-8-9406 1301
Facsimile	: ----	Facsimile	: +61-8-9406 1399
Project	: WA_0089_PFASOMP_24	Page	: 1 of 2
Order number	: pfas-omp/Stirling	Quote number	: ES2022MWHAUS0002 (SY/139/19 B)
C-O-C number	: 65032	QC Level	: NEPM 2013 B3 & ALS QC Standard
Site	: Stirling SD - CG		
Sampler	: [redacted]		

Dates

Date Samples Received	: 13-Mar-2024 16:30	Issue Date	: 15-Mar-2024
Client Requested Due Date	: 21-Mar-2024	Scheduled Reporting Date	: **21-Mar-2024**

Delivery Details

Mode of Delivery	: Carrier	Security Seal	: Not Available
No. of coolers/boxes	: 1	Temperature	: 7.6 - Ice present
Receipt Detail	:	No. of samples received / analysed	: 3 / 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 see scanned COC for sample discrepencies: extra samples , samples not received etc.
- Please direct any queries related to sample condition / numbering / breakages to Sample Receipt (Samples.Perth@alsglobal.com)
- Analytical work for this work order will be conducted at ALS Environmental Perth.
- Please direct any turnaround / technical queries to the laboratory contact designated above.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months) from receipt of samples.
- **pH analysis should be conducted within 6 hours of sampling.**
- **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.**
- 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: **SOIL**

Laboratory sample ID	Sampling date / time	Sample ID	SOIL - EA055-103 Moisture Content	SOIL - EP231X (solids) PFAS - Full Suite (28 analytes)
EP2403295-001	13-Mar-2024 08:09	0089_SD369_240313	✓	✓
EP2403295-002	13-Mar-2024 08:10	0089_SD367_240313	✓	✓
EP2403295-003	13-Mar-2024 08:10	0089_SD345_240313	✓	✓

Proactive Holding Time Report

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

Requested Deliverables

[redacted]
- A4 - AU Tax Invoice (INV) — Email — [redacted]cardno.com.au

DERP LAB REPORTS
- *AU Certificate of Analysis - NATA (COA) — Email — derp.labreports@esdat.com.au
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI) — Email — derp.labreports@esdat.com.au
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC) — Email — derp.labreports@esdat.com.au
- A4 - AU Sample Receipt Notification - Environmental HT (SRN) — Email — derp.labreports@esdat.com.au
- Chain of Custody (CoC) (COC) — Email — derp.labreports@esdat.com.au
- EDI Format - ESDAT (ESDAT) — Email — derp.labreports@esdat.com.au
- EDI Format - XTab (XTAB) — Email — derp.labreports@esdat.com.au

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

CERTIFICATE OF ANALYSIS

Work Order	: **EP2403295**	Page	: 1 of 5
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: Customer Services EP
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: +61-8-9406 1301
Project	: WA_0089_PFASOMP_24	Date Samples Received	: 13-Mar-2024 16:30
Order number	: pfas-omp/Stirling	Date Analysis Commenced	: 15-Mar-2024
C-O-C number	: 65032	Issue Date	: 21-Mar-2024 22:56
Sampler	: [redacted] [redacted]		
Site	: Stirling SD - CG		
Quote number	: SY/139/19 B		
No. of samples received	: 3		
No. of samples analysed	: 3		

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]	Inorganics Analyst	Perth Inorganics, Wangara, WA
[redacted]	Senior Organic Chemist	Perth Organics, Wangara, WA

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.

- 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: SEDIMENT (Matrix: SOIL)				Sample ID	0089_SD369_240313	0089_SD367_240313	0089_SD345_240313	----	----
				Sampling date / time	13-Mar-2024 08:09	13-Mar-2024 08:10	13-Mar-2024 08:10	----	----
Compound	CAS Number	LOR	Unit		EP2403295-001	EP2403295-002	EP2403295-003	--------	--------
					Result	Result	Result	----	----
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content	----	0.1	%		**35.1**	**25.3**	**22.6**	**----**	**----**
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	**----**	**----**
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	**----**	**----**
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	**----**	**----**
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	**----**	**----**
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg		**0.0002**	<0.0002	**0.0003**	**----**	**----**
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	**----**	**----**
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg		<0.001	<0.001	<0.001	**----**	**----**
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	**----**	**----**
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	**----**	**----**
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	**----**	**----**
Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	**----**	**----**
Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	**----**	**----**
Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	**----**	**----**
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	**----**	**----**
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	**----**	**----**
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	**----**	**----**
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	**----**	**----**
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	**----**	**----**

Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)				Sample ID	0089_SD369_240313	0089_SD367_240313	0089_SD345_240313	----	----
				Sampling date / time	13-Mar-2024 08:09	13-Mar-2024 08:10	13-Mar-2024 08:10	----	----
Compound	CAS Number	LOR	Unit		EP2403295-001	EP2403295-002	EP2403295-003	--------	--------
					Result	Result	Result	----	----
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	----	----
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	----	----
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	----	----
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	----	----
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	----	----
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	----	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	----	----
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	----	----
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	----	----
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	----	----
EP231P: PFAS Sums									
Sum of PFAS	----	0.0002	mg/kg		**0.0002**	<0.0002	**0.0003**	----	----
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg		**0.0002**	<0.0002	**0.0003**	----	----
Sum of PFAS (WA DER List)	----	0.0002	mg/kg		**0.0002**	<0.0002	**0.0003**	----	----
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.0002	%		**94.0**	**92.0**	**107**	----	----
13C8-PFOA	----	0.0002	%		**94.5**	**99.0**	**106**	----	----

Surrogate Control Limits

Sub-Matrix: **SEDIMENT**		Recovery Limits (%)	
Compound	*CAS Number*	*Low*	*High*
EP231S: PFAS Surrogate			
13C4-PFOS	----	76	136
13C8-PFOA	----	78	131

QUALITY CONTROL REPORT

Work Order	: **EP2403295**	Page	: 1 of 7
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: Customer Services EP
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: +61-8-9406 1301
Project	: WA_0089_PFASOMP_24	Date Samples Received	: 13-Mar-2024
Order number	: pfas-omp/Stirling	Date Analysis Commenced	: 15-Mar-2024
C-O-C number	: 65032	Issue Date	: 21-Mar-2024
Sampler	: [redacted]		
Site	: Stirling SD - CG		
Quote number	: SY/139/19 B		
No. of samples received	: 3		
No. of samples analysed	: 3		

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]	Inorganics Analyst	Perth Inorganics, Wangara, WA
[redacted]	Senior Organic Chemist	Perth Organics, Wangara, WA

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: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
EA055: Moisture Content (Dried @ 105-110°C) (QC Lot: 5669935)									
EP2403295-001	0089_SD369_240313	EA055: Moisture Content	----	0.1	%	35.1	36.5	3.9	0% - 20%
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 5664832)									
EP2403150-003	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
EP2403346-001	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 5664832)									
EP2403150-003	Anonymous	EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit

Sub-Matrix: **SOIL**

				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: 5664832) - continued									
EP2403150-003	Anonymous	EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	<0.001	0.0	No Limit
EP2403346-001	Anonymous	EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	<0.001	0.0	No Limit
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 5664832)									
EP2403150-003	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
EP2403346-001	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit

Sub-Matrix: **SOIL**

				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: 5664832) - continued									
EP2403346-001	Anonymous	EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 5664832)									
EP2403150-003	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
EP2403346-001	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
EP231P: PFAS Sums (QC Lot: 5664832)									
EP2403150-003	Anonymous	EP231X: Sum of PFAS	----	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Sum of PFAS (WA DER List)	----	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
EP2403346-001	Anonymous	EP231X: Sum of PFAS	----	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Sum of PFAS (WA DER List)	----	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit

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: **SOIL**

				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: 5664832)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	0.0011 mg/kg	98.2	72.0	128
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	0.00125 mg/kg	86.8	73.0	123
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	0.00118 mg/kg	90.2	67.0	130
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	0.00119 mg/kg	89.9	70.0	132
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	0.00116 mg/kg	88.4	68.0	136
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	0.0012 mg/kg	87.9	59.0	134
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5664832)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	0.00625 mg/kg	76.4	71.0	135
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	0.00125 mg/kg	101	69.0	132
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	0.00125 mg/kg	94.4	70.0	132
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	0.00125 mg/kg	93.6	71.0	131
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	98.4	69.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	97.6	72.0	129
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	0.00125 mg/kg	89.6	69.0	133
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	104	64.0	136
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	86.4	69.0	135
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	90.4	66.0	139
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	0.00125 mg/kg	99.2	69.0	133
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5664832)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	0.00125 mg/kg	88.8	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	0.00312 mg/kg	91.0	59.6	143
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	0.00312 mg/kg	93.8	62.8	140
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	0.00312 mg/kg	90.9	61.5	139
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	0.00312 mg/kg	94.1	61.9	139
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	0.00125 mg/kg	90.0	63.0	144
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	0.00125 mg/kg	92.4	61.0	139
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5664832)								

Sub-Matrix: **SOIL**

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: 5664832) - continued								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	0.00117 mg/kg	101	62.0	145
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	0.00118 mg/kg	95.8	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	0.0012 mg/kg	98.8	65.0	137
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	0.0012 mg/kg	86.2	54.8	124
EP231P: PFAS Sums (QCLot: 5664832)								
EP231X: Sum of PFAS	----	0.0002	mg/kg	<0.0002	----	----	----	----
EP231X: Sum of PFHxS and PFOS	355-46-4/17 63-23-1	0.0002	mg/kg	<0.0002	----	----	----	----
EP231X: Sum of PFAS (WA DER List)	----	0.0002	mg/kg	<0.0002	----	----	----	----

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: **SOIL**

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: 5664832)							
EP2403150-004	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0011 mg/kg	91.8	72.0	128
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.00117 mg/kg	82.5	73.0	123
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.00118 mg/kg	89.4	67.0	130
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.00119 mg/kg	92.8	70.0	132
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.00116 mg/kg	90.5	68.0	136
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0012 mg/kg	88.3	59.0	134
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5664832)							
EP2403150-004	Anonymous	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.00625 mg/kg	105	71.0	135
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.00125 mg/kg	92.8	69.0	132
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.00125 mg/kg	97.2	70.0	132
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.00125 mg/kg	96.4	71.0	131
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.00125 mg/kg	100	69.0	133
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.00125 mg/kg	94.8	72.0	129
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.00125 mg/kg	91.2	69.0	133
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.00125 mg/kg	102	64.0	136
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.00125 mg/kg	94.8	69.0	135
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.00125 mg/kg	89.2	66.0	139
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.00125 mg/kg	95.6	69.0	133
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5664832)							

Sub-Matrix: **SOIL**

				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: 5664832) - continued							
EP2403150-004	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.00125 mg/kg	92.8	48.0	128
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.00312 mg/kg	101	60.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.00312 mg/kg	105	60.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.00312 mg/kg	87.7	60.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.00312 mg/kg	86.2	60.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.00125 mg/kg	100	63.0	144
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.00125 mg/kg	86.0	61.0	139
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5664832)							
EP2403150-004	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.00117 mg/kg	98.8	62.0	145
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.00118 mg/kg	96.6	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0012 mg/kg	104	65.0	137
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0012 mg/kg	91.6	60.0	130

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **EP2403295**	Page	: 1 of 4
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Telephone	: +61-8-9406 1301
Project	: WA_0089_PFASOMP_24	Date Samples Received	: 13-Mar-2024
Site	: Stirling SD - CG	Issue Date	: 21-Mar-2024
Sampler	: [redacted]	No. of samples received	: 3
Order number	: pfas-omp/Stirling	No. of samples analysed	: 3

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: **SOIL**

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
EA055: Moisture Content (Dried @ 105-110°C)								
HDPE Soil Jar (EA055)								
0089_SD369_240313, 0089_SD345_240313	0089_SD367_240313,	**13-Mar-2024**	**----**	----	----	**18-Mar-2024**	27-Mar-2024	✓
EP231A: Perfluoroalkyl Sulfonic Acids								
HDPE Soil Jar (EP231X)								
0089_SD369_240313, 0089_SD345_240313	0089_SD367_240313,	**13-Mar-2024**	**15-Mar-2024**	09-Sep-2024	✓	**15-Mar-2024**	24-Apr-2024	✓
EP231B: Perfluoroalkyl Carboxylic Acids								
HDPE Soil Jar (EP231X)								
0089_SD369_240313, 0089_SD345_240313	0089_SD367_240313,	**13-Mar-2024**	**15-Mar-2024**	09-Sep-2024	✓	**15-Mar-2024**	24-Apr-2024	✓
EP231C: Perfluoroalkyl Sulfonamides								
HDPE Soil Jar (EP231X)								
0089_SD369_240313, 0089_SD345_240313	0089_SD367_240313,	**13-Mar-2024**	**15-Mar-2024**	09-Sep-2024	✓	**15-Mar-2024**	24-Apr-2024	✓
EP231D: (n:2) Fluorotelomer Sulfonic Acids								
HDPE Soil Jar (EP231X)								
0089_SD369_240313, 0089_SD345_240313	0089_SD367_240313,	**13-Mar-2024**	**15-Mar-2024**	09-Sep-2024	✓	**15-Mar-2024**	24-Apr-2024	✓
EP231P: PFAS Sums								
HDPE Soil Jar (EP231X)								
0089_SD369_240313, 0089_SD345_240313	0089_SD367_240313,	**13-Mar-2024**	**15-Mar-2024**	09-Sep-2024	✓	**15-Mar-2024**	24-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: **SOIL**

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)							
Moisture Content	EA055	1	3	**33.33**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	18	**11.11**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	18	**5.56**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	18	**5.56**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	18	**5.56**	**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
Moisture Content	EA055	SOIL	In house: A gravimetric procedure based on weight loss over a 12 hour drying period at 105-110 degrees C. This method is compliant with NEPM Schedule B(3).
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	SOIL	In-house: Analysis of soils by solvent extraction followed by LC-Electrospray-MS-MS, Negative Mode using MRM using internal standard quantitation. Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to a portion of soil which is then extracted with MTBE and an ion pairing reagent. A portion of extract is exchanged into the analytical solvent mixture, combined with an equal volume reagent water and 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
QuECheRS Extraction of Solids	* ORG71	SOIL	In house: Sequential extractions with Acetonitrile/Methanol by shaking. Extraction efficiency aided by the addition of salts under acidic conditions. Where relevant, interferences from co-extracted organics are removed with dispersive clean-up media (dSPE). The extract is either diluted or concentrated and exchanged into the analytical solvent.

ALSCompass
SAMPLING *Intelligence*

ALS

Environmental Division
Perth
Work Order Reference
EP2403297

Telephone : 61-8-9406 1301

Custody Document for Submissions via ALS Compass App

Project: WA_0081_PFASOMP_24 **Client:** Stantec

Project Manager: [redacted]

ALS Compass COC Reference: 65035, 65034, 65032, 65036 **# Samples:** 1 ESKY

Phone: ( )

Sampler: [redacted]

Turnaround Requirements: Standard ~~Standard~~ Urgent

Phone: ( )

Special Instructions:

Custody:

Relinquished by:	Received by:	Relinquished by:	Received by:
[redacted]	[redacted]		
Date / Time: 13/3/24	Date / Time: 13/3 1630	Date / Time:	Date / Time:

CHAIN OF CUSTODY

ALS COC#: 65034 ALS Laboratory: EP Perth Environmental

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP_24

SITE: Stirling SW/PW - CG

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted]

SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B

/ ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO: [redacted]

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

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	WA OMP Water Suite WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
001	0089_PW345		13/03/2024 08:15 AM	WATER	ALS: 3 Non ALS: 0	No	X		
002	0089_PW367		13/03/2024 08:16 AM	WATER	ALS: 3 Non ALS: 0	No	X		
003	0089_PW369		13/03/2024 08:17 AM	WATER	ALS: 3 Non ALS: 0	No	X		
004	0089_SW370		13/03/2024 08:18 AM	WATER	ALS: 5 Non ALS: 0	No	X		

CHAIN OF CUSTODY

COC#: 65034 ALS Laboratory: EP Perth Environmental

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

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP_24

SITE: Stirling SW/PW - CG

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES 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	0089_PW345	Clear Plastic Bottle - Natural	125 mL	00070821217477	Green	No	
001	0089_PW345	HDPE (no PTFE)	20 mL	00352309065819	Grey	No	
001	0089_PW345	HDPE (no PTFE)	20 mL	00352309065814	Grey	No	
002	0089_PW367	HDPE (no PTFE)	20 mL	00352309065805	Grey	No	
002	0089_PW367	Clear Plastic Bottle - Natural	125 mL	00070821217534	Green	No	
002	0089_PW367	HDPE (no PTFE)	20 mL	00352309065922	Grey	No	
003	0089_PW369	HDPE (no PTFE)	20 mL	00352309065925	Grey	No	
003	0089_PW369	HDPE (no PTFE)	20 mL	00352309065827	Grey	No	
003	0089_PW369	Clear Plastic Bottle - Natural	125 mL	00070821217395	Green	No	
004	0089_SW370	HDPE (no PTFE)	20 mL	00352312003869	Grey	No	
004	0089_SW370	HDPE (no PTFE)	20 mL	00352312004221	Grey	No	
004	0089_SW370	Clear Plastic Bottle - Natural	125 mL	00070821217530	Green	No	
004	0089_SW370	HDPE (no PTFE)	20 mL	00352309065943	Grey	No	
004	0089_SW370	HDPE (no PTFE)	20 mL	00352309065879	Grey	No	

Total Bottle Count: ALS: 14, Non ALS: 0

SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : **EP2403297**

Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: Customer Services EP
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
E-mail	: [redacted]stantec.com	E-mail	: ALSEnviro.Perth@alsglobal.com
Telephone	: ----	Telephone	: +61-8-9406 1301
Facsimile	: ----	Facsimile	: +61-8-9406 1399
Project	: WA_0089_PFASOMP_24	Page	: 1 of 2
Order number	: pfas-omp/Stirling	Quote number	: ES2022MWHAUS0002 (SY/139/19 B)
C-O-C number	: 65034	QC Level	: NEPM 2013 B3 & ALS QC Standard
Site	: Stirling SW/PW - CG		
Sampler	: [redacted]		

Dates

Date Samples Received	: 13-Mar-2024 16:30	Issue Date	: 14-Mar-2024
Client Requested Due Date	: 21-Mar-2024	Scheduled Reporting Date	: **21-Mar-2024**

Delivery Details

Mode of Delivery	: Carrier	Security Seal	: Not Available
No. of coolers/boxes	: 1	Temperature	: 7.6 - Ice present
Receipt Detail	:	No. of samples received / analysed	: 4 / 4

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 see scanned COC for sample discrepencies: extra samples , samples not received etc.
- Please direct any queries related to sample condition / numbering / breakages to Sample Receipt (Samples.Perth@alsglobal.com)
- Analytical work for this work order will be conducted at ALS Environmental Perth.
- Please direct any turnaround / technical queries to the laboratory contact designated above.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months) from receipt of samples.
- **pH analysis should be conducted within 6 hours of sampling.**
- **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.**
- 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)	WATER - NT-01 & 02 Ca, Mg, Na, K, Cl, SO4, Alkalinity
EP2403297-001	13-Mar-2024 08:15	0089_PW345_240313	✓	✓
EP2403297-002	13-Mar-2024 08:16	0089_PW367_240313	✓	✓
EP2403297-003	13-Mar-2024 08:17	0089_PW369_240313	✓	✓
EP2403297-004	13-Mar-2024 08:18	0089_SW370_240313	✓	✓

Proactive Holding Time Report

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

Requested Deliverables

[redacted]
- A4 - AU Tax Invoice (INV) — Email — [redacted]cardno.com.au

DERP LAB REPORTS
- *AU Certificate of Analysis - NATA (COA) — Email — derp.labreports@esdat.com.au
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI) — Email — derp.labreports@esdat.com.au
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC) — Email — derp.labreports@esdat.com.au
- A4 - AU Sample Receipt Notification - Environmental HT (SRN) — Email — derp.labreports@esdat.com.au
- Chain of Custody (CoC) (COC) — Email — derp.labreports@esdat.com.au
- EDI Format - ESDAT (ESDAT) — Email — derp.labreports@esdat.com.au

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

CERTIFICATE OF ANALYSIS

Work Order	: **EP2403297**	Page	: 1 of 6
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: Customer Services EP
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: +61-8-9406 1301
Project	: WA_0089_PFASOMP_24	Date Samples Received	: 13-Mar-2024 16:30
Order number	: pfas-omp/Stirling	Date Analysis Commenced	: 14-Mar-2024
C-O-C number	: 65034	Issue Date	: 21-Mar-2024 23:36
Sampler	: [redacted] [redacted]		
Site	: Stirling SW/PW - CG		
Quote number	: SY/139/19 B		
No. of samples received	: 4		
No. of samples analysed	: 4		

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]	Inorganics Supervisor	Perth Inorganics, Wangara, WA
[redacted]	Inorganics Analyst	Perth Inorganics, Wangara, WA
[redacted]	Senior Organic Chemist	Perth Organics, Wangara, WA

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.
- As per QWI – EN55-3 Data Interpreting Procedures, Ionic balances are typically calculated using Major Anions - Chloride, Alkalinity and Sulfate; and Major Cations - Calcium, Magnesium, Potassium and Sodium. Where applicable and dependent upon sample matrix, the Ionic Balance may also include the additional contribution of Ammonia, Dissolved Metals by ICPMS and H+ to the Cations and Nitrate, SiO2 and Fluoride to the Anions.
- Sodium Adsorption Ratio (where reported): Where results for Na, Ca or Mg are <LOR, a concentration at half the reported LOR is incorporated into the SAR calculation. This represents a conservative approach for Na relative to the assumption that <LOR = zero concentration and a conservative approach for Ca & Mg relative to the assumption that <LOR is equivalent to the LOR concentration.
- 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.
- ED045G: The presence of Thiocyanate, Thiosulfate and Sulfite can positively contribute to the chloride result, thereby may bias results higher than expected. Results should be scrutinised accordingly.

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_PW345_240313	0089_PW367_240313	0089_PW369_240313	0089_SW370_240313	----
				Sampling date / time	13-Mar-2024 08:15	13-Mar-2024 08:16	13-Mar-2024 08:17	13-Mar-2024 08:18	----
Compound	CAS Number	LOR	Unit		EP2403297-001	EP2403297-002	EP2403297-003	EP2403297-004	--------
					Result	Result	Result	Result	----
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	<1	<1	<1	----
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	<1	<1	<1	----
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		443	158	362	234	----
Total Alkalinity as CaCO3	----	1	mg/L		443	158	362	234	----
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		2430	2300	2260	2340	----
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		18300	17700	18200	17800	----
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		518	466	502	489	----
Magnesium	7439-95-4	1	mg/L		1450	1470	1420	1480	----
Sodium	7440-23-5	1	mg/L		10900	10700	10300	10700	----
Potassium	7440-09-7	1	mg/L		570	540	533	544	----
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		576	550	568	556	----
ø Total Cations	----	0.01	meq/L		634	623	604	626	----
ø Ionic Balance	----	0.01	%		4.81	6.23	3.06	5.93	----
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		<0.01	0.02	<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		0.01	0.08	0.02	0.06	----
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)			Sample ID	0089_PW345_240313	0089_PW367_240313	0089_PW369_240313	0089_SW370_240313	----
			Sampling date / time	13-Mar-2024 08:15	13-Mar-2024 08:16	13-Mar-2024 08:17	13-Mar-2024 08:18	----
Compound	CAS Number	LOR	Unit	EP2403297-001	EP2403297-002	EP2403297-003	EP2403297-004	--------
				Result	Result	Result	Result	----
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	<0.02	<0.02	<0.02	<0.02	----
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	----
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	----
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								

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_PW345_240313	0089_PW367_240313	0089_PW369_240313	0089_SW370_240313	----
				Sampling date / time	13-Mar-2024 08:15	13-Mar-2024 08:16	13-Mar-2024 08:17	13-Mar-2024 08:18	----
Compound	CAS Number	LOR	Unit		EP2403297-001	EP2403297-002	EP2403297-003	EP2403297-004	--------
					Result	Result	Result	Result	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
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		**0.01**	**0.10**	**0.02**	**0.06**	----
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		**0.01**	**0.10**	**0.02**	**0.06**	----
Sum of PFAS (WA DER List)	----	0.01	µg/L		**0.01**	**0.10**	**0.02**	**0.06**	----
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**93.0**	**98.1**	**97.5**	**91.2**	----
13C8-PFOA	----	0.02	%		**104**	**99.7**	**84.7**	**97.4**	----

Surrogate Control Limits

Sub-Matrix: SURFACE WATER		Recovery Limits (%)	
Compound	CAS Number	Low	High
EP231S: PFAS Surrogate			
13C4-PFOS	----	65	140
13C8-PFOA	----	71	133

QUALITY CONTROL REPORT

Work Order	: **EP2403297**	Page	: 1 of 10
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: Customer Services EP
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: +61-8-9406 1301
Project	: WA_0089_PFASOMP_24	Date Samples Received	: 13-Mar-2024
Order number	: pfas-omp/Stirling	Date Analysis Commenced	: 14-Mar-2024
C-O-C number	: 65034	Issue Date	: 21-Mar-2024
Sampler	: [redacted]		
Site	: Stirling SW/PW - CG		
Quote number	: SY/139/19 B		
No. of samples received	: 4		
No. of samples analysed	: 4		

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]	Inorganics Supervisor	Perth Inorganics, Wangara, WA
[redacted]	Inorganics Analyst	Perth Inorganics, Wangara, WA
[redacted]	Senior Organic Chemist	Perth Organics, Wangara, WA

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 (%)
ED037P: Alkalinity by PC Titrator (QC Lot: 5665216)									
EP2403186-002	Anonymous	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	7	8	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	260	261	0.6	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	267	269	0.9	0% - 20%
EP2403298-002	Anonymous	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	490	494	0.8	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	490	494	0.8	0% - 20%
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QC Lot: 5663481)									
EP2403297-001	0089_PW345_240313	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	2430	2390	1.9	0% - 20%
EP2403368-001	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	64	66	3.0	0% - 20%
ED045G: Chloride by Discrete Analyser (QC Lot: 5663482)									
EP2403297-001	0089_PW345_240313	ED045G: Chloride	16887-00-6	1	mg/L	18300	18800	2.7	0% - 20%
EP2403368-001	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	383	378	1.1	0% - 20%
ED093F: Dissolved Major Cations (QC Lot: 5663411)									
EP2403297-001	0089_PW345_240313	ED093F: Calcium	7440-70-2	1	mg/L	518	547	5.4	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	1450	1530	5.0	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	10900	11500	5.4	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	570	595	4.3	0% - 20%
EP2403298-007	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	67	66	0.0	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	35	35	0.0	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	146	145	0.0	0% - 20%

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 (%)
ED093F: Dissolved Major Cations (QC Lot: 5663411) - continued									
EP2403298-007	Anonymous	ED093F: Potassium	7440-09-7	1	mg/L	15	15	0.0	0% - 50%
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 5665735)									
EP2403138-010	Anonymous	EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	1.31	1.28	2.6	0% - 20%
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	1.44	1.49	3.2	0% - 20%
		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	0.03	0.03	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	0.18	0.17	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: 5665736)									
EP2403297-004	0089_SW370_240313	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
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 5665735)									
EP2403138-010	Anonymous	EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	0.07	0.07	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	0.07	0.07	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: 5665736)									
EP2403297-004	0089_SW370_240313	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

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: 5665736) - continued									
EP2403297-004	0089_SW370_240313	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: 5665735)									
EP2403138-010	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
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 5665736)									
EP2403297-004	0089_SW370_240313	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: 5665735)									
EP2403138-010	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
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 5665736)									

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: 5665736) - continued									
EP2403297-004	0089_SW370_240313	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: 5665735)									
EP2403138-010	Anonymous	EP231X: Sum of PFAS	----	0.01	µg/L	3.10	3.11	0.3	0% - 20%
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	2.75	2.77	0.7	0% - 20%
		EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	2.89	2.91	0.7	0% - 20%
EP231P: PFAS Sums (QC Lot: 5665736)									
EP2403297-004	0089_SW370_240313	EP231X: Sum of PFAS	----	0.01	µg/L	0.06	0.06	0.0	No Limit
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	0.06	0.06	0.0	No Limit
		EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	0.06	0.06	0.0	No Limit

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
ED037P: Alkalinity by PC Titrator (QCLot: 5665216)								
ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	----	----	----	----
ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	----	----	----	----
ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	<1	----	----	----	----
ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	<1	20 mg/L	113	85.1	126
				<1	200 mg/L	108	90.5	111
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 5663481)								
ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<1	25 mg/L	95.6	89.9	112
				<1	500 mg/L	97.7	89.9	112
ED045G: Chloride by Discrete Analyser (QCLot: 5663482)								
ED045G: Chloride	16887-00-6	1	mg/L	<1	10 mg/L	96.0	88.6	113
				<1	1000 mg/L	96.5	88.6	113
ED093F: Dissolved Major Cations (QCLot: 5663411)								
ED093F: Calcium	7440-70-2	1	mg/L	<1	50 mg/L	96.0	86.5	117
ED093F: Magnesium	7439-95-4	1	mg/L	<1	50 mg/L	107	88.4	110
ED093F: Sodium	7440-23-5	1	mg/L	<1	50 mg/L	99.3	91.4	113
ED093F: Potassium	7440-09-7	1	mg/L	<1	50 mg/L	99.2	84.6	108
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5665735)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.2218 µg/L	93.3	72.0	130
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.2352 µg/L	84.2	71.0	127
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	0.2373 µg/L	82.8	68.0	131
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.238 µg/L	79.4	69.0	134
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.232 µg/L	89.4	65.0	140
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.241 µg/L	86.1	53.0	142
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5665736)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.2218 µg/L	90.6	72.0	130
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.2352 µg/L	85.9	71.0	127
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	0.2373 µg/L	88.3	68.0	131
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.238 µg/L	86.1	69.0	134
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.232 µg/L	88.6	65.0	140
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.241 µg/L	89.2	53.0	142

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: 5665735)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	1.25 µg/L	106	73.0	129
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	0.25 µg/L	91.2	72.0	129
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	0.25 µg/L	106	72.0	129
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	0.25 µg/L	89.8	72.0	130
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	0.25 µg/L	92.8	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	87.6	71.0	129
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	0.25 µg/L	92.4	69.0	133
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	0.25 µg/L	92.6	72.0	134
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	0.25 µg/L	92.2	65.0	144
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	0.25 µg/L	100	71.0	132
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5665736)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	1.25 µg/L	93.9	73.0	129
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	0.25 µg/L	88.8	72.0	129
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	0.25 µg/L	105	72.0	129
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	0.25 µg/L	91.6	72.0	130
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	0.25 µg/L	93.2	71.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	0.25 µg/L	94.0	69.0	130
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	0.25 µg/L	96.0	71.0	129
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	0.25 µg/L	86.0	69.0	133
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	0.25 µg/L	95.0	72.0	134
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	0.25 µg/L	98.0	65.0	144
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	0.25 µg/L	93.8	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5665735)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.25 µg/L	88.0	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	0.625 µg/L	105	68.0	141
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	0.625 µg/L	89.4	60.5	138
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	0.625 µg/L	94.0	68.3	134
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	0.625 µg/L	91.6	62.2	138
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	0.25 µg/L	109	65.0	136
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	0.25 µg/L	86.6	61.0	135

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: 5665736)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.25 µg/L	88.2	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	0.625 µg/L	104	68.0	141
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	0.625 µg/L	101	60.5	138
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	0.625 µg/L	93.4	68.3	134
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	0.625 µg/L	86.8	62.2	138
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	0.25 µg/L	92.8	65.0	136
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	0.25 µg/L	70.8	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5665735)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.2343 µg/L	98.2	63.0	143
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	0.2378 µg/L	101	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	0.24 µg/L	94.4	67.0	138
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	0.241 µg/L	81.1	64.2	133
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5665736)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.2343 µg/L	103	63.0	143
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	0.2378 µg/L	110	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	0.24 µg/L	111	67.0	138
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	0.241 µg/L	88.8	64.2	133
EP231P: PFAS Sums (QCLot: 5665735)								
EP231X: Sum of PFAS	----	0.01	µg/L	<0.01	----	----	----	----
EP231X: Sum of PFHxS and PFOS	355-46-4/17 63-23-1	0.01	µg/L	<0.01	----	----	----	----
EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	<0.01	----	----	----	----
EP231P: PFAS Sums (QCLot: 5665736)								
EP231X: Sum of PFAS	----	0.01	µg/L	<0.01	----	----	----	----
EP231X: Sum of PFHxS and PFOS	355-46-4/17 63-23-1	0.01	µg/L	<0.01	----	----	----	----
EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	<0.01	----	----	----	----

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**

Matrix Spike (MS) Report

Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 5663481)							
EP2403297-001	0089_PW345_240313	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	100 mg/L	# Not Determined	70.4	130
ED045G: Chloride by Discrete Analyser (QCLot: 5663482)							
EP2403297-001	0089_PW345_240313	ED045G: Chloride	16887-00-6	200 mg/L	# Not Determined	70.0	130
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5665735)							
EP2403138-012	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.2218 µg/L	91.6	72.0	129
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.232 µg/L	77.2	71.0	127
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.2352 µg/L	71.3	68.0	129
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.238 µg/L	87.4	69.0	134
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.232 µg/L	85.6	65.0	140
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.241 µg/L	87.8	53.0	129
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5665735)							
EP2403138-012	Anonymous	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	1.25 µg/L	93.8	73.0	142
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.25 µg/L	93.0	72.0	129
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.25 µg/L	105	72.0	129
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.25 µg/L	87.0	72.0	130
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.25 µg/L	94.0	71.0	133
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.25 µg/L	94.4	69.0	130
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.25 µg/L	89.8	71.0	134
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.25 µg/L	99.2	69.0	133
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.25 µg/L	97.6	72.0	134
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.25 µg/L	98.2	65.0	144
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.25 µg/L	95.6	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5665735)							
EP2403138-012	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.25 µg/L	93.4	59.0	135
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.625 µg/L	109	70.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.625 µg/L	75.5	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.625 µg/L	99.8	70.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.625 µg/L	90.5	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.25 µg/L	99.8	65.0	136
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.25 µg/L	79.6	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5665735)							

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: 5665735) - continued							
EP2403138-012	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.234 µg/L	98.7	63.0	143
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.2378 µg/L	96.7	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.24 µg/L	111	67.0	138
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.2415 µg/L	91.3	70.0	130

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **EP2403297**	Page	: 1 of 5
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Telephone	: +61-8-9406 1301
Project	: WA_0089_PFASOMP_24	Date Samples Received	: 13-Mar-2024
Site	: Stirling SW/PW - CG	Issue Date	: 21-Mar-2024
Sampler	: [redacted]	No. of samples received	: 4
Order number	: pfas-omp/Stirling	No. of samples analysed	: 4

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.**
- **Matrix Spike outliers exist - please see following pages for full details.**
- **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.**

Outliers : Quality Control Samples

Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

Matrix: **WATER**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
Matrix Spike (MS) Recoveries							
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA	EP2403297--001	0089_PW345_240313	**Sulfate as SO4 - Turbidimetric**	14808-79-8	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
ED045G: Chloride by Discrete Analyser	EP2403297--001	0089_PW345_240313	**Chloride**	16887-00-6	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**

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
ED037P: Alkalinity by PC Titrator							
Clear Plastic Bottle - Natural (ED037-P)							
0089_PW345_240313, 0089_PW367_240313, 0089_PW369_240313, 0089_SW370_240313	**13-Mar-2024**	**----**	----	**----**	**19-Mar-2024**	27-Mar-2024	✓
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA							
Clear Plastic Bottle - Natural (ED041G)							
0089_PW345_240313, 0089_PW367_240313, 0089_PW369_240313, 0089_SW370_240313	**13-Mar-2024**	**----**	----	**----**	**21-Mar-2024**	10-Apr-2024	✓
ED045G: Chloride by Discrete Analyser							
Clear Plastic Bottle - Natural (ED045G)							
0089_PW345_240313, 0089_PW367_240313, 0089_PW369_240313, 0089_SW370_240313	**13-Mar-2024**	**----**	----	**----**	**21-Mar-2024**	10-Apr-2024	✓
ED093F: Dissolved Major Cations							
Clear Plastic Bottle - Natural (ED093F)							
0089_PW345_240313, 0089_PW367_240313, 0089_PW369_240313, 0089_SW370_240313	**13-Mar-2024**	**----**	----	**----**	**15-Mar-2024**	20-Mar-2024	✓
EP231A: Perfluoroalkyl Sulfonic Acids							
HDPE (no PTFE) (EP231X)							
0089_PW345_240313, 0089_PW367_240313, 0089_PW369_240313, 0089_SW370_240313	**13-Mar-2024**	**15-Mar-2024**	09-Sep-2024	✓	**15-Mar-2024**	09-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)							
0089_PW345_240313, 0089_PW367_240313, 0089_PW369_240313, 0089_SW370_240313	**13-Mar-2024**	**15-Mar-2024**	09-Sep-2024	✓	**15-Mar-2024**	09-Sep-2024	✓
EP231C: Perfluoroalkyl Sulfonamides							
HDPE (no PTFE) (EP231X)							
0089_PW345_240313, 0089_PW367_240313, 0089_PW369_240313, 0089_SW370_240313	**13-Mar-2024**	**15-Mar-2024**	09-Sep-2024	✓	**15-Mar-2024**	09-Sep-2024	✓
EP231D: (n:2) Fluorotelomer Sulfonic Acids							
HDPE (no PTFE) (EP231X)							
0089_PW345_240313, 0089_PW367_240313, 0089_PW369_240313, 0089_SW370_240313	**13-Mar-2024**	**15-Mar-2024**	09-Sep-2024	✓	**15-Mar-2024**	09-Sep-2024	✓
EP231P: PFAS Sums							
HDPE (no PTFE) (EP231X)							
0089_PW345_240313, 0089_PW367_240313, 0089_PW369_240313, 0089_SW370_240313	**13-Mar-2024**	**15-Mar-2024**	09-Sep-2024	✓	**15-Mar-2024**	09-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)							
Alkalinity by Auto Titrator	ED037-P	2	19	**10.53**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	12	**16.67**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Alkalinity by Auto Titrator	ED037-P	2	19	**10.53**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	12	**16.67**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Alkalinity by Auto Titrator	ED037-P	1	19	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	12	**16.67**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Chloride by Discrete Analyser	ED045G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	12	**8.33**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	20	**5.00**	**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
Alkalinity by Auto Titrator	ED037-P	WATER	In house: Referenced to APHA 2320 B This procedure determines alkalinity by automated measurement (e.g. PC Titrate) on a settled supernatant aliquot of the sample using pH 4.5 for indicating the total alkalinity end-point. This method is compliant with NEPM Schedule B(3)
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	WATER	In house: Referenced to APHA 4500-SO4. Dissolved sulfate is determined in a 0.45um filtered sample. Sulfate ions are converted to a barium sulfate suspension in an acetic acid medium with barium chloride. Light absorbance of the BaSO4 suspension is measured by a photometer and the SO4-2 concentration is determined by comparison of the reading with a standard curve. This method is compliant with NEPM Schedule B(3)
Chloride by Discrete Analyser	ED045G	WATER	In house: Referenced to APHA 4500 Cl - G.The thiocyanate ion is liberated from mercuric thiocyanate through sequestration of mercury by the chloride ion to form non-ionised mercuric chloride. In the presence of ferric ions the liberated thiocynate forms highly-coloured ferric thiocynate which is measured at 480 nm.
Major Cations - Dissolved	ED093F	WATER	In house: Referenced to APHA 3120 and 3125; USEPA SW 846 - 6010 and 6020; Cations are determined by either ICP-AES or ICP-MS techniques. This method is compliant with NEPM Schedule B(3) Sodium Adsorption Ratio is calculated from Ca, Mg and Na which determined by ALS in house method QWI-EN/ED093F. This method is compliant with NEPM Schedule B(3) Hardness parameters are calculated based on APHA 2340 B. This method is compliant with NEPM Schedule B(3)
Ionic Balance by PCT DA and Turbi SO4 DA	* EN055 - PG	WATER	In house: Referenced to APHA 1030F. This method is compliant with NEPM Schedule B(3)
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.

ALSCompass
SAMPLING *Intelligence*

ALS

Environmental Division
Perth
Work Order Reference
EP2403298

Telephone 61-8-9406 1301

Custody Document for Submissions via ALS Compass App

Project: WA_00881_PBASOMP_24 **Client:** Stantec **Project Manager:** [redacted]

ALS Compass COC Reference: 65035, 65037, 65032, 65036 **# Samples:** 1 Esky **Phone:** [redacted]

Turnaround Requirements: Standard ~~Standard~~ Urgent **Sampler:** [redacted]

Phone: [redacted]

Special Instructions:

Custody:

Relinquished by:	Received by:	Relinquished by:	Received by:
[redacted]	[redacted]		
Date / Time: 13/3/24	**Date / Time:** 13/3 1630	**Date / Time:**	**Date / Time:**

CHAIN OF CUSTODY

COC#: 65035 ALS Laboratory: EP Perth Environmental

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

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP_24

SITE: Stirling GW - JS

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted]

QUOTE NO: SY/139/19 B

SAMPLER MOBILE: [redacted] / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES 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	WA OMP Water Suite WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
001	0089_MW224		13/03/2024 08:17 AM	WATER	ALS: 5 Non ALS: 0	No	X		
002	0089_MW282		13/03/2024 08:32 AM	WATER	ALS: 5 Non ALS: 0	No	X		
003	0089_MW220		13/03/2024 08:55 AM	WATER	ALS: 3 Non ALS: 0	No	X		
004	0089_MW217		13/03/2024 09:07 AM	WATER	ALS: 5 Non ALS: 0	No	X		
005	0089_MW249		13/03/2024 09:26 AM	WATER	ALS: 3 Non ALS: 0	No	X		
006	0089_MW516		13/03/2024 09:38 AM	WATER	ALS: 3 Non ALS: 0	No	X		
007	0089_MW496		13/03/2024 09:47 AM	WATER	ALS: 5 Non ALS: 0	No	X		

CHAIN OF CUSTODY

ALS COC#: 65035 ALS Laboratory: EP Perth Environmental

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

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP_24

SITE: Stirling GW - JS

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted] SAMPLER MOBILE [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES 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	0089_MW224	Clear Plastic Bottle - Natural	125 mL	00070821217431	Green	No	
001	0089_MW224	HDPE (no PTFE)	20 mL	00350822058929	Grey	No	
001	0089_MW224	HDPE (no PTFE)	20 mL	00350822058862	Grey	No	
001	0089_MW224	HDPE (no PTFE)	20 mL	00352309065857	Grey	No	
001	0089_MW224	HDPE (no PTFE)	20 mL	00352309065932	Grey	No	
002	0089_MW282	Clear Plastic Bottle - Natural	125 mL	00070821217540	Green	No	
002	0089_MW282	HDPE (no PTFE)	20 mL	00352309050505	Grey	No	
002	0089_MW282	HDPE (no PTFE)	20 mL	00352309050514	Grey	No	
002	0089_MW282	HDPE (no PTFE)	20 mL	00350822058932	Grey	No	
002	0089_MW282	HDPE (no PTFE)	20 mL	00350822058894	Grey	No	
003	0089_MW220	Clear Plastic Bottle - Natural	125 mL	00070821217548	Green	No	
003	0089_MW220	HDPE (no PTFE)	20 mL	00352309050379	Grey	No	
003	0089_MW220	HDPE (no PTFE)	20 mL	00352309050377	Grey	No	
004	0089_MW217	HDPE (no PTFE)	20 mL	00350822058785	Grey	No	
004	0089_MW217	HDPE (no PTFE)	20 mL	00350822058825	Grey	No	
004	0089_MW217	Clear Plastic Bottle - Natural	125 mL	00070821217584	Green	No	
004	0089_MW217	HDPE (no PTFE)	20 mL	00352309050615	Grey	No	
004	0089_MW217	HDPE (no PTFE)	20 mL	00352309050672	Grey	No	
005	0089_MW249	Clear Plastic Bottle - Natural	125 mL	00070821217566	Green	No	
005	0089_MW249	HDPE (no PTFE)	20 mL	00352309050657	Grey	No	
005	0089_MW249	HDPE (no PTFE)	20 mL	00352309050644	Grey	No	
006	0089_MW516	Clear Plastic Bottle - Natural	125 mL	00070821217618	Green	No	
006	0089_MW516	HDPE (no PTFE)	20 mL	00352309050526	Grey	No	
006	0089_MW516	HDPE (no PTFE)	20 mL	00352309050521	Grey	No	
007	0089_MW496	HDPE (no PTFE)	20 mL	00352309050510	Grey	No	
007	0089_MW496	Clear Plastic Bottle - Natural	125 mL	00070821217628	Green	No	

CHAIN OF CUSTODY

COC#: **65035** *ALS Laboratory:* EP Perth Environmental

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

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP_24

SITE: Stirling GW - JS

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted]

QUOTE NO: SY/139/19 B

SAMPLER MOBILE: [redacted] / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES 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:			

007	0089_MW496	HDPE (no PTFE)	20 mL	00352309050462	Grey	No	
007	0089_MW496	HDPE (no PTFE)	20 mL	00350822058912	Grey	No	
007	0089_MW496	HDPE (no PTFE)	20 mL	00350822058922	Grey	No	

Total Bottle Count: ALS: 29, Non ALS: 0

SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : **EP2403298**

Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: Customer Services EP
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
E-mail	: [redacted]stantec.com	E-mail	: ALSEnviro.Perth@alsglobal.com
Telephone	: ----	Telephone	: +61-8-9406 1301
Facsimile	: ----	Facsimile	: +61-8-9406 1399
Project	: WA_0089_PFASOMP_24	Page	: 1 of 2
Order number	: pfas-omp/Stirling	Quote number	: ES2022MWHAUS0002 (SY/139/19 B)
C-O-C number	: 65035	QC Level	: NEPM 2013 B3 & ALS QC Standard
Site	: Stirling GW - JS		
Sampler	: [redacted]		

Dates

Date Samples Received	: 13-Mar-2024 16:30	Issue Date	: 14-Mar-2024
Client Requested Due Date	: 21-Mar-2024	Scheduled Reporting Date	: **21-Mar-2024**

Delivery Details

Mode of Delivery	: Carrier	Security Seal	: Not Available
No. of coolers/boxes	: 1	Temperature	: 7.6 - Ice present
Receipt Detail	:	No. of samples received / analysed	: 7 / 7

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 see scanned COC for sample discrepencies: extra samples , samples not received etc.
- Please direct any queries related to sample condition / numbering / breakages to Sample Receipt (Samples.Perth@alsglobal.com)
- Analytical work for this work order will be conducted at ALS Environmental Perth.
- Please direct any turnaround / technical queries to the laboratory contact designated above.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months) from receipt of samples.
- **pH analysis should be conducted within 6 hours of sampling.**
- **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.**
- 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)	WATER - NT-01 & 02 Ca, Mg, Na, K, Cl, SO4, Alkalinity
EP2403298-001	13-Mar-2024 08:17	0089_MW224_240313	✓	✓
EP2403298-002	13-Mar-2024 08:32	0089_MW282_240313	✓	✓
EP2403298-003	13-Mar-2024 08:55	0089_MW220_240313	✓	✓
EP2403298-004	13-Mar-2024 09:07	0089_MW217_240313	✓	✓
EP2403298-005	13-Mar-2024 09:26	0089_MW249_240313	✓	✓
EP2403298-006	13-Mar-2024 09:38	0089_MW516_240313	✓	✓
EP2403298-007	13-Mar-2024 09:47	0089_MW496_240313	✓	✓

Proactive Holding Time Report

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

Requested Deliverables

[redacted]
- A4 - AU Tax Invoice (INV) — Email — [redacted]cardno.com.au

DERP LAB REPORTS
- *AU Certificate of Analysis - NATA (COA) — Email — derp.labreports@esdat.com.au
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI) — Email — derp.labreports@esdat.com.au
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC) — Email — derp.labreports@esdat.com.au
- A4 - AU Sample Receipt Notification - Environmental HT (SRN) — Email — derp.labreports@esdat.com.au
- Chain of Custody (CoC) (COC) — Email — derp.labreports@esdat.com.au
- EDI Format - ESDAT (ESDAT) — Email — derp.labreports@esdat.com.au
- EDI Format - XTab (XTAB) — Email — derp.labreports@esdat.com.au

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

CERTIFICATE OF ANALYSIS

Work Order	: **EP2403298**	Page	: 1 of 9
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: Customer Services EP
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: +61-8-9406 1301
Project	: WA_0089_PFASOMP_24	Date Samples Received	: 13-Mar-2024 16:30
Order number	: pfas-omp/Stirling	Date Analysis Commenced	: 14-Mar-2024
C-O-C number	: 65035	Issue Date	: 21-Mar-2024 23:37
Sampler	: [redacted] [redacted]		
Site	: Stirling GW - JS		
Quote number	: SY/139/19 B		
No. of samples received	: 7		
No. of samples analysed	: 7		

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]	Inorganics Supervisor	Perth Inorganics, Wangara, WA
[redacted]	Inorganics Analyst	Perth Inorganics, Wangara, WA
[redacted]	Senior Organic Chemist	Perth Organics, Wangara, WA

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.
- As per QWI – EN55-3 Data Interpreting Procedures, Ionic balances are typically calculated using Major Anions - Chloride, Alkalinity and Sulfate; and Major Cations - Calcium, Magnesium, Potassium and Sodium. Where applicable and dependent upon sample matrix, the Ionic Balance may also include the additional contribution of Ammonia, Dissolved Metals by ICPMS and H+ to the Cations and Nitrate, SiO2 and Fluoride to the Anions.
- Sodium Adsorption Ratio (where reported): Where results for Na, Ca or Mg are <LOR, a concentration at half the reported LOR is incorporated into the SAR calculation. This represents a conservative approach for Na relative to the assumption that <LOR = zero concentration and a conservative approach for Ca & Mg relative to the assumption that <LOR is equivalent to the LOR concentration.
- 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.
- ED045G: The presence of Thiocyanate, Thiosulfate and Sulfite can positively contribute to the chloride result, thereby may bias results higher than expected. Results should be scrutinised accordingly.

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW224_240313	0089_MW282_240313	0089_MW220_240313	0089_MW217_240313	0089_MW249_240313
				Sampling date / time	13-Mar-2024 08:17	13-Mar-2024 08:32	13-Mar-2024 08:55	13-Mar-2024 09:07	13-Mar-2024 09:26
Compound	CAS Number	LOR	Unit		EP2403298-001	EP2403298-002	EP2403298-003	EP2403298-004	EP2403298-005
					Result	Result	Result	Result	Result
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	<1	<1	<1	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	<1	<1	<1	<1
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		226	490	240	249	437
Total Alkalinity as CaCO3	----	1	mg/L		226	490	240	249	437
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		37	54	18	19	46
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		110	64	55	38	212
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		58	162	90	90	97
Magnesium	7439-95-4	1	mg/L		22	30	13	12	42
Sodium	7440-23-5	1	mg/L		75	45	33	32	124
Potassium	7440-09-7	1	mg/L		4	4	6	6	10
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		8.39	12.7	6.72	6.44	15.7
ø Total Cations	----	0.01	meq/L		8.07	12.6	7.15	7.02	13.9
ø Ionic Balance	----	0.01	%		1.94	0.42	3.09	4.32	5.82
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		<0.02	1.62	0.05	<0.02	<0.02
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		<0.02	6.18	0.02	<0.02	<0.02
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		<0.01	36.8	0.18	0.02	0.26
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		<0.02	5.55	0.02	<0.02	<0.02
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		<0.01	62.9	3.69	0.06	0.03
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW224_240313	0089_MW282_240313	0089_MW220_240313	0089_MW217_240313	0089_MW249_240313
				Sampling date / time	13-Mar-2024 08:17	13-Mar-2024 08:32	13-Mar-2024 08:55	13-Mar-2024 09:07	13-Mar-2024 09:26
Compound	CAS Number	LOR	Unit		EP2403298-001	EP2403298-002	EP2403298-003	EP2403298-004	EP2403298-005
					Result	Result	Result	Result	Result
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		<0.1	**0.7**	<0.1	**1.3**	<0.1
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		<0.02	**1.26**	**0.10**	**5.32**	<0.02
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		<0.02	**7.94**	**0.11**	**4.55**	**0.02**
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		<0.02	**2.41**	**0.05**	**1.06**	<0.02
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		<0.01	**5.24**	**0.04**	**0.30**	<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
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									

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW224_240313	0089_MW282_240313	0089_MW220_240313	0089_MW217_240313	0089_MW249_240313
				Sampling date / time	13-Mar-2024 08:17	13-Mar-2024 08:32	13-Mar-2024 08:55	13-Mar-2024 09:07	13-Mar-2024 09:26
Compound	CAS Number	LOR	Unit		EP2403298-001	EP2403298-002	EP2403298-003	EP2403298-004	EP2403298-005
					Result	Result	Result	Result	Result
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
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	**27.2**	<0.05
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		<0.05	<0.05	<0.05	**0.33**	<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	**131**	**4.26**	**40.1**	**0.31**
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		<0.01	**99.7**	**3.87**	**0.08**	**0.29**
Sum of PFAS (WA DER List)	----	0.01	µg/L		<0.01	**119**	**4.22**	**40.1**	**0.31**
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**89.4**	**70.1**	**91.6**	**98.8**	**92.6**
13C8-PFOA	----	0.02	%		**92.6**	**88.9**	**94.2**	**92.3**	**82.4**

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW516_240313	0089_MW496_240313	----	----	----
				Sampling date / time	13-Mar-2024 09:38	13-Mar-2024 09:47	----	----	----
Compound	CAS Number	LOR	Unit		EP2403298-006	EP2403298-007	--------	--------	--------
					Result	Result	----	----	----
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	<1	----	----	----
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	<1	----	----	----
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		**500**	**407**	----	----	----
Total Alkalinity as CaCO3	----	1	mg/L		**500**	**407**	----	----	----
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		**26**	**55**	----	----	----
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		**66**	**207**	----	----	----
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		**112**	**67**	----	----	----
Magnesium	7439-95-4	1	mg/L		**40**	**35**	----	----	----
Sodium	7440-23-5	1	mg/L		**58**	**146**	----	----	----
Potassium	7440-09-7	1	mg/L		**10**	**15**	----	----	----
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		**12.4**	**15.1**	----	----	----
ø Total Cations	----	0.01	meq/L		**11.6**	**13.0**	----	----	----
ø Ionic Balance	----	0.01	%		**3.05**	**7.69**	----	----	----
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		**0.03**	**0.05**	----	----	----
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		<0.02	**0.06**	----	----	----
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		**0.23**	**0.96**	----	----	----
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		<0.02	**0.08**	----	----	----
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		**3.22**	**5.28**	----	----	----
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	<0.02	----	----	----

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW516_240313	0089_MW496_240313	----	----	----
				Sampling date / time	13-Mar-2024 09:38	13-Mar-2024 09:47	----	----	----
Compound	CAS Number	LOR	Unit		EP2403298-006	EP2403298-007	--------	--------	--------
					Result	Result	----	----	----
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		<0.1	<0.1	----	----	----
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		<0.02	**0.02**	----	----	----
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		**0.02**	**0.16**	----	----	----
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		<0.02	**0.03**	----	----	----
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		**0.01**	**0.09**	----	----	----
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		<0.05	<0.05	----	----	----
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L		<0.02	<0.02	----	----	----
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L		<0.05	<0.05	----	----	----
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L		<0.05	<0.05	----	----	----
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L		<0.05	<0.05	----	----	----
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L		<0.05	<0.05	----	----	----
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L		<0.02	<0.02	----	----	----
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L		<0.02	<0.02	----	----	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids									

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW516_240313	0089_MW496_240313	----	----	----
				Sampling date / time	13-Mar-2024 09:38	13-Mar-2024 09:47	----	----	----
Compound	CAS Number	LOR	Unit		EP2403298-006	EP2403298-007	--------	--------	--------
					Result	Result	----	----	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L		<0.05	<0.05	----	----	----
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		<0.05	<0.05	----	----	----
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		<0.05	<0.05	----	----	----
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L		<0.05	<0.05	----	----	----
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L		**3.51**	**6.73**	----	----	----
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		**3.45**	**6.24**	----	----	----
Sum of PFAS (WA DER List)	----	0.01	µg/L		**3.51**	**6.59**	----	----	----
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**88.2**	**89.2**	----	----	----
13C8-PFOA	----	0.02	%		**91.8**	**88.2**	----	----	----

Surrogate Control Limits

Sub-Matrix: **GROUNDWATER**		Recovery Limits (%)	
Compound	*CAS Number*	*Low*	*High*
EP231S: PFAS Surrogate			
13C4-PFOS	----	65	140
13C8-PFOA	----	71	133

QUALITY CONTROL REPORT

Work Order	: **EP2403298**	Page	: 1 of 10
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: Customer Services EP
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: +61-8-9406 1301
Project	: WA_0089_PFASOMP_24	Date Samples Received	: 13-Mar-2024
Order number	: pfas-omp/Stirling	Date Analysis Commenced	: 14-Mar-2024
C-O-C number	: 65035	Issue Date	: 21-Mar-2024
Sampler	: [redacted]		
Site	: Stirling GW - JS		
Quote number	: SY/139/19 B		
No. of samples received	: 7		
No. of samples analysed	: 7		

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]	Inorganics Supervisor	Perth Inorganics, Wangara, WA
[redacted]	Inorganics Analyst	Perth Inorganics, Wangara, WA
[redacted]	Senior Organic Chemist	Perth Organics, Wangara, WA

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 (%)*
ED037P: Alkalinity by PC Titrator (QC Lot: 5665216)									
EP2403186-002	Anonymous	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	7	8	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	260	261	0.6	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	267	269	0.9	0% - 20%
EP2403298-002	0089_MW282_240313	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	490	494	0.8	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	490	494	0.8	0% - 20%
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QC Lot: 5663481)									
EP2403297-001	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	2430	2390	1.9	0% - 20%
EP2403368-001	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	64	66	3.0	0% - 20%
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QC Lot: 5663714)									
EP2403298-007	0089_MW496_240313	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	55	55	0.0	0% - 20%
EP2403371-018	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	146	149	1.7	0% - 20%
ED045G: Chloride by Discrete Analyser (QC Lot: 5663482)									
EP2403297-001	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	18300	18800	2.7	0% - 20%
EP2403368-001	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	383	378	1.1	0% - 20%
ED045G: Chloride by Discrete Analyser (QC Lot: 5663715)									
EP2403298-007	0089_MW496_240313	ED045G: Chloride	16887-00-6	1	mg/L	207	210	1.5	0% - 20%
EP2403371-018	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	1100	1060	3.1	0% - 20%

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 (%)
ED093F: Dissolved Major Cations (QC Lot: 5663411)									
EP2403297-001	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	518	547	5.4	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	1450	1530	5.0	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	10900	11500	5.4	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	570	595	4.3	0% - 20%
EP2403298-007	0089_MW496_240313	ED093F: Calcium	7440-70-2	1	mg/L	67	66	0.0	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	35	35	0.0	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	146	145	0.0	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	15	15	0.0	0% - 50%
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 5665711)									
EP2403138-013	Anonymous	EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01 (0.40)*	µg/L	18.6	21.7	15.6	0% - 20%
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01 (0.40)*	µg/L	50.6	56.5	11.1	0% - 20%
		EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	0.41	0.37	9.9	0% - 20%
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	0.86	0.79	7.7	0% - 20%
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	4.04	3.98	1.7	0% - 20%
		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: 5665735)									
EP2403138-010	Anonymous	EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	1.31	1.28	2.6	0% - 20%
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	1.44	1.49	3.2	0% - 20%
		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	0.03	0.03	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	0.18	0.17	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: 5665711)									
EP2403138-013	Anonymous	EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	1.20	0.98	19.8	0% - 20%
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	0.50	0.45	11.2	0% - 20%
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	2.68	2.52	6.1	0% - 20%
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	0.29	0.27	7.7	0% - 50%
		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	0.3	0.2	0.0	No Limit
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 5665735)									
EP2403138-010	Anonymous	EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	0.07	0.07	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: 5665735) - continued									
EP2403138-010	Anonymous	EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	0.07	0.07	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: 5665711)									
EP2403138-013	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
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 5665735)									
EP2403138-010	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: 5665711)									
EP2403138-013	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

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: 5665711) - continued									
EP2403138-013	Anonymous	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: 5665735)									
EP2403138-010	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: 5665711)									
EP2403138-013	Anonymous	EP231X: Sum of PFAS	----	0.01 (0.40)*	µg/L	79.5	87.8	9.9	0% - 20%
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01 (0.40)*	µg/L	69.2	78.2	12.2	0% - 20%
		EP231X: Sum of PFAS (WA DER List)	----	0.01 (0.40)*	µg/L	74.6	83.0	10.7	0% - 20%
EP231P: PFAS Sums (QC Lot: 5665735)									
EP2403138-010	Anonymous	EP231X: Sum of PFAS	----	0.01	µg/L	3.10	3.11	0.3	0% - 20%
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	2.75	2.77	0.7	0% - 20%
		EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	2.89	2.91	0.7	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
ED037P: Alkalinity by PC Titrator (QCLot: 5665216)								
ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	----	----	----	----
ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	----	----	----	----
ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	<1	----	----	----	----
ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	<1	20 mg/L	113	85.1	126
				<1	200 mg/L	108	90.5	111
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 5663481)								
ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<1	25 mg/L	95.6	89.9	112
				<1	500 mg/L	97.7	89.9	112
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 5663714)								
ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<1	25 mg/L	94.6	89.9	112
				<1	500 mg/L	93.4	89.9	112
ED045G: Chloride by Discrete Analyser (QCLot: 5663482)								
ED045G: Chloride	16887-00-6	1	mg/L	<1	10 mg/L	96.0	88.6	113
				<1	1000 mg/L	96.5	88.6	113
ED045G: Chloride by Discrete Analyser (QCLot: 5663715)								
ED045G: Chloride	16887-00-6	1	mg/L	<1	10 mg/L	95.9	88.6	113
				<1	1000 mg/L	94.0	88.6	113
ED093F: Dissolved Major Cations (QCLot: 5663411)								
ED093F: Calcium	7440-70-2	1	mg/L	<1	50 mg/L	96.0	86.5	117
ED093F: Magnesium	7439-95-4	1	mg/L	<1	50 mg/L	107	88.4	110
ED093F: Sodium	7440-23-5	1	mg/L	<1	50 mg/L	99.3	91.4	113
ED093F: Potassium	7440-09-7	1	mg/L	<1	50 mg/L	99.2	84.6	108
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5665711)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.2218 µg/L	92.4	72.0	130
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.2352 µg/L	88.9	71.0	127
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	0.2373 µg/L	87.9	68.0	131
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.238 µg/L	84.9	69.0	134
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.232 µg/L	104	65.0	140
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.241 µg/L	92.7	53.0	142
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5665735)								

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
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5665735) - continued								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.2218 µg/L	93.3	72.0	130
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.2352 µg/L	84.2	71.0	127
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	0.2373 µg/L	82.8	68.0	131
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.238 µg/L	79.4	69.0	134
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.232 µg/L	89.4	65.0	140
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.241 µg/L	86.1	53.0	142
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5665711)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	1.25 µg/L	98.0	73.0	129
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	0.25 µg/L	92.8	72.0	129
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	0.25 µg/L	103	72.0	129
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	0.25 µg/L	92.8	72.0	130
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	0.25 µg/L	94.6	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	88.6	71.0	129
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	0.25 µg/L	89.0	69.0	133
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	0.25 µg/L	92.4	72.0	134
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	0.25 µg/L	99.2	65.0	144
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	0.25 µg/L	96.4	71.0	132
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5665735)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	1.25 µg/L	106	73.0	129
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	0.25 µg/L	91.2	72.0	129
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	0.25 µg/L	106	72.0	129
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	0.25 µg/L	89.8	72.0	130
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	0.25 µg/L	92.8	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	87.6	71.0	129
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	0.25 µg/L	92.4	69.0	133
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	0.25 µg/L	92.6	72.0	134
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	0.25 µg/L	92.2	65.0	144
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	0.25 µg/L	100	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5665711)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.25 µg/L	93.2	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	0.625 µg/L	116	68.0	141
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	0.625 µg/L	97.8	60.5	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
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5665711) - continued								
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	0.625 µg/L	97.9	68.3	134
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	0.625 µg/L	89.4	62.2	138
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	0.25 µg/L	99.6	65.0	136
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	0.25 µg/L	87.8	61.0	135
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5665735)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.25 µg/L	88.0	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	0.625 µg/L	105	68.0	141
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	0.625 µg/L	89.4	60.5	138
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	0.625 µg/L	94.0	68.3	134
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	0.625 µg/L	91.6	62.2	138
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	0.25 µg/L	109	65.0	136
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	0.25 µg/L	86.6	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5665711)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.2343 µg/L	107	63.0	143
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	0.2378 µg/L	107	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	0.24 µg/L	110	67.0	138
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	0.241 µg/L	94.2	64.2	133
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5665735)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.2343 µg/L	98.2	63.0	143
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	0.2378 µg/L	101	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	0.24 µg/L	94.4	67.0	138
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	0.241 µg/L	81.1	64.2	133
EP231P: PFAS Sums (QCLot: 5665711)								
EP231X: Sum of PFAS	----	0.01	µg/L	<0.01	----	----	----	----
EP231X: Sum of PFHxS and PFOS	355-46-4/17 63-23-1	0.01	µg/L	<0.01	----	----	----	----
EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	<0.01	----	----	----	----
EP231P: PFAS Sums (QCLot: 5665735)								
EP231X: Sum of PFAS	----	0.01	µg/L	<0.01	----	----	----	----

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	LCS: Spike Recovery (%)	Acceptable Limits (%): Low	Acceptable Limits (%): High
EP231P: PFAS Sums (QCLot: 5665735) - continued								
EP231X: Sum of PFHxS and PFOS	355-46-4/17 63-23-1	0.01	µg/L	<0.01	----	----	----	----
EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	<0.01	----	----	----	----

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
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 5663481)							
EP2403297-001	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	100 mg/L	# Not Determined	70.4	130
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 5663714)							
EP2403298-007	0089_MW496_240313	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	100 mg/L	88.8	70.4	130
ED045G: Chloride by Discrete Analyser (QCLot: 5663482)							
EP2403297-001	Anonymous	ED045G: Chloride	16887-00-6	200 mg/L	# Not Determined	70.0	130
ED045G: Chloride by Discrete Analyser (QCLot: 5663715)							
EP2403298-007	0089_MW496_240313	ED045G: Chloride	16887-00-6	200 mg/L	120	70.0	130
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5665735)							
EP2403138-012	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.2218 µg/L	91.6	72.0	129
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.232 µg/L	77.2	71.0	127
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.2352 µg/L	71.3	68.0	129
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.238 µg/L	87.4	69.0	134
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.232 µg/L	85.6	65.0	140
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.241 µg/L	87.8	53.0	129
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5665735)							
EP2403138-012	Anonymous	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	1.25 µg/L	93.8	73.0	142
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.25 µg/L	93.0	72.0	129
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.25 µg/L	105	72.0	129
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.25 µg/L	87.0	72.0	130
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.25 µg/L	94.0	71.0	133
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.25 µg/L	94.4	69.0	130
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.25 µg/L	89.8	71.0	134
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.25 µg/L	99.2	69.0	133

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: 5665735) - continued							
EP2403138-012	Anonymous	EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.25 µg/L	97.6	72.0	134
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.25 µg/L	98.2	65.0	144
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.25 µg/L	95.6	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5665735)							
EP2403138-012	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.25 µg/L	93.4	59.0	135
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.625 µg/L	109	70.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.625 µg/L	75.5	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.625 µg/L	99.8	70.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.625 µg/L	90.5	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.25 µg/L	99.8	65.0	136
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.25 µg/L	79.6	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5665735)							
EP2403138-012	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.234 µg/L	98.7	63.0	143
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.2378 µg/L	96.7	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.24 µg/L	111	67.0	138
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.2415 µg/L	91.3	70.0	130

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **EP2403298**	Page	: 1 of 5
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Telephone	: +61-8-9406 1301
Project	: WA_0089_PFASOMP_24	Date Samples Received	: 13-Mar-2024
Site	: Stirling GW - JS	Issue Date	: 21-Mar-2024
Sampler	: [redacted]	No. of samples received	: 7
Order number	: pfas-omp/Stirling	No. of samples analysed	: 7

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.**
- **Matrix Spike outliers exist - please see following pages for full details.**
- **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.**

Outliers : Quality Control Samples

Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

Matrix: **WATER**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
Matrix Spike (MS) Recoveries							
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA	EP2403297--001	Anonymous	**Sulfate as SO4 - Turbidimetric**	14808-79-8	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
ED045G: Chloride by Discrete Analyser	EP2403297--001	Anonymous	**Chloride**	16887-00-6	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**

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
ED037P: Alkalinity by PC Titrator							
Clear Plastic Bottle - Natural (ED037-P)							
0089_MW224_240313, 0089_MW282_240313, 0089_MW220_240313, 0089_MW217_240313, 0089_MW249_240313, 0089_MW516_240313, 0089_MW496_240313	**13-Mar-2024**	**----**	----	**----**	**19-Mar-2024**	27-Mar-2024	✓
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA							
Clear Plastic Bottle - Natural (ED041G)							
0089_MW224_240313, 0089_MW282_240313, 0089_MW220_240313, 0089_MW217_240313, 0089_MW249_240313, 0089_MW516_240313, 0089_MW496_240313	**13-Mar-2024**	**----**	----	**----**	**21-Mar-2024**	10-Apr-2024	✓
ED045G: Chloride by Discrete Analyser							
Clear Plastic Bottle - Natural (ED045G)							
0089_MW224_240313, 0089_MW282_240313, 0089_MW220_240313, 0089_MW217_240313, 0089_MW249_240313, 0089_MW516_240313, 0089_MW496_240313	**13-Mar-2024**	**----**	----	**----**	**21-Mar-2024**	10-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
ED093F: Dissolved Major Cations							
Clear Plastic Bottle - Natural (ED093F)							
0089_MW224_240313, 0089_MW220_240313, 0089_MW249_240313, 0089_MW496_240313, 0089_MW282_240313, 0089_MW217_240313, 0089_MW516_240313,	**13-Mar-2024**	**----**	----	----	**15-Mar-2024**	20-Mar-2024	✓
EP231A: Perfluoroalkyl Sulfonic Acids							
HDPE (no PTFE) (EP231X)							
0089_MW224_240313, 0089_MW220_240313, 0089_MW249_240313, 0089_MW496_240313, 0089_MW282_240313, 0089_MW217_240313, 0089_MW516_240313,	**13-Mar-2024**	**15-Mar-2024**	09-Sep-2024	✓	**15-Mar-2024**	09-Sep-2024	✓
EP231B: Perfluoroalkyl Carboxylic Acids							
HDPE (no PTFE) (EP231X)							
0089_MW224_240313, 0089_MW220_240313, 0089_MW249_240313, 0089_MW496_240313, 0089_MW282_240313, 0089_MW217_240313, 0089_MW516_240313,	**13-Mar-2024**	**15-Mar-2024**	09-Sep-2024	✓	**15-Mar-2024**	09-Sep-2024	✓
EP231C: Perfluoroalkyl Sulfonamides							
HDPE (no PTFE) (EP231X)							
0089_MW224_240313, 0089_MW220_240313, 0089_MW249_240313, 0089_MW496_240313, 0089_MW282_240313, 0089_MW217_240313, 0089_MW516_240313,	**13-Mar-2024**	**15-Mar-2024**	09-Sep-2024	✓	**15-Mar-2024**	09-Sep-2024	✓
EP231D: (n:2) Fluorotelomer Sulfonic Acids							
HDPE (no PTFE) (EP231X)							
0089_MW224_240313, 0089_MW220_240313, 0089_MW249_240313, 0089_MW496_240313, 0089_MW282_240313, 0089_MW217_240313, 0089_MW516_240313,	**13-Mar-2024**	**15-Mar-2024**	09-Sep-2024	✓	**15-Mar-2024**	09-Sep-2024	✓
EP231P: PFAS Sums							
HDPE (no PTFE) (EP231X)							
0089_MW224_240313, 0089_MW220_240313, 0089_MW249_240313, 0089_MW496_240313, 0089_MW282_240313, 0089_MW217_240313, 0089_MW516_240313,	**13-Mar-2024**	**15-Mar-2024**	09-Sep-2024	✓	**15-Mar-2024**	09-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)							
Alkalinity by Auto Titrator	ED037-P	2	19	**10.53**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	4	38	**10.53**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	16	**12.50**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	4	39	**10.26**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Alkalinity by Auto Titrator	ED037-P	2	19	**10.53**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	4	38	**10.53**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	16	**12.50**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	4	39	**10.26**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Alkalinity by Auto Titrator	ED037-P	1	19	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	38	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	16	**12.50**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	39	**5.13**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Chloride by Discrete Analyser	ED045G	2	38	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	16	**6.25**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	39	**5.13**	**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
Alkalinity by Auto Titrator	ED037-P	WATER	In house: Referenced to APHA 2320 B This procedure determines alkalinity by automated measurement (e.g. PC Titrate) on a settled supernatant aliquot of the sample using pH 4.5 for indicating the total alkalinity end-point. This method is compliant with NEPM Schedule B(3)
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	WATER	In house: Referenced to APHA 4500-SO4. Dissolved sulfate is determined in a 0.45um filtered sample. Sulfate ions are converted to a barium sulfate suspension in an acetic acid medium with barium chloride. Light absorbance of the BaSO4 suspension is measured by a photometer and the SO4-2 concentration is determined by comparison of the reading with a standard curve. This method is compliant with NEPM Schedule B(3)
Chloride by Discrete Analyser	ED045G	WATER	In house: Referenced to APHA 4500 Cl - G.The thiocyanate ion is liberated from mercuric thiocyanate through sequestration of mercury by the chloride ion to form non-ionised mercuric chloride. In the presence of ferric ions the liberated thiocynate forms highly-coloured ferric thiocynate which is measured at 480 nm.
Major Cations - Dissolved	ED093F	WATER	In house: Referenced to APHA 3120 and 3125; USEPA SW 846 - 6010 and 6020; Cations are determined by either ICP-AES or ICP-MS techniques. This method is compliant with NEPM Schedule B(3) Sodium Adsorption Ratio is calculated from Ca, Mg and Na which determined by ALS in house method QWI-EN/ED093F. This method is compliant with NEPM Schedule B(3) Hardness parameters are calculated based on APHA 2340 B. This method is compliant with NEPM Schedule B(3)
Ionic Balance by PCT DA and Turbi SO4 DA	* EN055 - PG	WATER	In house: Referenced to APHA 1030F. This method is compliant with NEPM Schedule B(3)
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.

ALSCompass
SAMPLING *Intelligence*

ALS

Environmental Division
Perth
Work Order Reference
EP2403299

Telephone : 61-8-9406 1301

Custody Document for Submissions via ALS Compass App

Project: WA_0089_PFASOMP_24 **Client:** Stantec **Project Manager:** [redacted]

ALS Compass COC Reference: 65035, 65034, 65032, 65036 **# Samples:** 1 ESKs **Sampler:** [redacted]

Turnaround Requirements: Standard ____ Urgent ____ **Phone:** [redacted]

Special Instructions:

Custody:

Relinquished by:	Received by:	Relinquished by:	Received by:
[redacted]	[redacted]		
Date / Time: 13/3/24	Date / Time: 13/3 1630	Date / Time:	Date / Time:

CHAIN OF CUSTODY

COC#: **65036** *ALS Laboratory:* EP Perth Environmental

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

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP_24

SITE: Stirling GW - CG

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted] SAMPLER MOBILE [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES 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	Rinsate WATER	WA OMP Water Suite WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
001	0089_MW200		13/03/2024 08:20 AM	WATER	ALS: 5 Non ALS: 0	No		X		
002	0089_MW173		13/03/2024 09:30 AM	WATER	ALS: 3 Non ALS: 0	No		X		
003	0089_MW203		13/03/2024 09:43 AM	WATER	ALS: 3 Non ALS: 0	No		X		
004	0089_QC301		13/03/2024 10:03 AM	WATER	ALS: 2 Non ALS: 0	No	X			
005	0089_QC401		13/03/2024 10:05 AM	WATER	ALS: 2 Non ALS: 0	No	X			
006	0089_QC302		13/03/2024 10:07 AM	WATER	ALS: 2 Non ALS: 0	No	X			
007	0089_QC402		13/03/2024 10:08 AM	WATER	ALS: 2 Non ALS: 0	No	X			

CHAIN OF CUSTODY

COC#: 65036 ALS Laboratory: EP Perth Environmental

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

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP_24

SITE: Stirling GW - CG

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted] derp.labreports@esdat.com.au

EMAIL INVOICES 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	0089_MW200	HDPE (no PTFE)	20 mL	00352312003992	Grey	No	
001	0089_MW200	Clear Plastic Bottle - Natural	125 mL	00070821217466	Green	No	
001	0089_MW200	HDPE (no PTFE)	20 mL	00352312004568	Grey	No	
001	0089_MW200	HDPE (no PTFE)	20 mL	00352309066002	Grey	No	
001	0089_MW200	HDPE (no PTFE)	20 mL	00352309065867	Grey	No	
002	0089_MW173	Clear Plastic Bottle - Natural	125 mL	00070821217523	Green	No	
002	0089_MW173	HDPE (no PTFE)	20 mL	00352309065822	Grey	No	
002	0089_MW173	HDPE (no PTFE)	20 mL	00352309065831	Grey	No	
003	0089_MW203	Clear Plastic Bottle - Natural	125 mL	00070821217522	Green	No	
003	0089_MW203	HDPE (no PTFE)	20 mL	00352309065834	Grey	No	
003	0089_MW203	HDPE (no PTFE)	20 mL	00352309065849	Grey	No	
004	0089_QC301	HDPE (no PTFE)	20 mL	00352309065841	Grey	No	
004	0089_QC301	HDPE (no PTFE)	20 mL	00352312003725	Grey	No	
005	0089_QC401	HDPE (no PTFE)	20 mL	00352312003933	Grey	No	
005	0089_QC401	HDPE (no PTFE)	20 mL	00352312004400	Grey	No	
006	0089_QC302	HDPE (no PTFE)	20 mL	00352309066025	Grey	No	
006	0089_QC302	HDPE (no PTFE)	20 mL	00352312003794	Grey	No	
007	0089_QC402	HDPE (no PTFE)	20 mL	00352309066020	Grey	No	
007	0089_QC402	HDPE (no PTFE)	20 mL	00352309065940	Grey	No	

Total Bottle Count: ALS: 19, Non ALS: 0

SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : **EP2403299**

Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: Customer Services EP
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
E-mail	: [redacted]stantec.com	E-mail	: ALSEnviro.Perth@alsglobal.com
Telephone	: ----	Telephone	: +61-8-9406 1301
Facsimile	: ----	Facsimile	: +61-8-9406 1399
Project	: WA_0089_PFASOMP_24	Page	: 1 of 2
Order number	: pfas-omp/Stirling	Quote number	: ES2022MWHAUS0002 (SY/139/19 B)
C-O-C number	: 65036	QC Level	: NEPM 2013 B3 & ALS QC Standard
Site	: Stirling GW - CG		
Sampler	: [redacted]		

Dates

Date Samples Received	: 13-Mar-2024 16:30	Issue Date	: 15-Mar-2024
Client Requested Due Date	: 21-Mar-2024	Scheduled Reporting Date	: **21-Mar-2024**

Delivery Details

Mode of Delivery	: Carrier	Security Seal	: Not Available
No. of coolers/boxes	: 1	Temperature	: 7.6 - Ice present
Receipt Detail	:	No. of samples received / analysed	: 7 / 7

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 see scanned COC for sample discrepencies: extra samples , samples not received etc.
- Please direct any queries related to sample condition / numbering / breakages to Sample Receipt (Samples.Perth@alsglobal.com)
- Analytical work for this work order will be conducted at ALS Environmental Perth.
- Please direct any turnaround / technical queries to the laboratory contact designated above.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months) from receipt of samples.
- **pH analysis should be conducted within 6 hours of sampling.**
- **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.**
- 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)	WATER - NT-01 & 02 Ca, Mg, Na, K, Cl, SO4, Alkalinity
EP2403299-001	13-Mar-2024 08:20	0089_MW200_240313	✓	✓
EP2403299-002	13-Mar-2024 09:30	0089_MW173_240313	✓	✓
EP2403299-003	13-Mar-2024 09:43	0089_MW203_240313	✓	✓
EP2403299-004	13-Mar-2024 10:03	0089_QC301_240313	✓	
EP2403299-005	13-Mar-2024 10:05	0089_QC401_240313	✓	
EP2403299-006	13-Mar-2024 10:07	0089_QC302_240313	✓	
EP2403299-007	13-Mar-2024 10:08	0089_QC402_240313	✓	

Proactive Holding Time Report

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

Requested Deliverables

[redacted]
- A4 - AU Tax Invoice (INV) — Email — [redacted]cardno.com.au

DERP LAB REPORTS
- *AU Certificate of Analysis - NATA (COA) — Email — derp.labreports@esdat.com.au
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI) — Email — derp.labreports@esdat.com.au
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC) — Email — derp.labreports@esdat.com.au
- A4 - AU Sample Receipt Notification - Environmental HT (SRN) — Email — derp.labreports@esdat.com.au
- Chain of Custody (CoC) (COC) — Email — derp.labreports@esdat.com.au
- EDI Format - ESDAT (ESDAT) — Email — derp.labreports@esdat.com.au
- EDI Format - XTab (XTAB) — Email — derp.labreports@esdat.com.au

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

CERTIFICATE OF ANALYSIS

Work Order	: **EP2403299**	Page	: 1 of 8
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: Customer Services EP
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: +61-8-9406 1301
Project	: WA_0089_PFASOMP_24	Date Samples Received	: 13-Mar-2024 16:30
Order number	: pfas-omp/Stirling	Date Analysis Commenced	: 15-Mar-2024
C-O-C number	: 65036	Issue Date	: 21-Mar-2024 23:38
Sampler	: [redacted] [redacted]		
Site	: Stirling GW - CG		
Quote number	: SY/139/19 B		
No. of samples received	: 7		
No. of samples analysed	: 7		

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]	Inorganics Supervisor	Perth Inorganics, Wangara, WA
[redacted]	Metals Chemist	Perth Inorganics, Wangara, WA
[redacted]	Senior Organic Chemist	Perth Organics, Wangara, WA

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.
- As per QWI – EN55-3 Data Interpreting Procedures, Ionic balances are typically calculated using Major Anions - Chloride, Alkalinity and Sulfate; and Major Cations - Calcium, Magnesium, Potassium and Sodium. Where applicable and dependent upon sample matrix, the Ionic Balance may also include the additional contribution of Ammonia, Dissolved Metals by ICPMS and H+ to the Cations and Nitrate, SiO2 and Fluoride to the Anions.
- EP231X: High LCS and MS recoveries deemed acceptable as all associated analyte results are less than LOR.
- Sodium Adsorption Ratio (where reported): Where results for Na, Ca or Mg are <LOR, a concentration at half the reported LOR is incorporated into the SAR calculation. This represents a conservative approach for Na relative to the assumption that <LOR = zero concentration and a conservative approach for Ca & Mg relative to the assumption that <LOR is equivalent to the LOR concentration.
- 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.
- ED045G: The presence of Thiocyanate, Thiosulfate and Sulfite can positively contribute to the chloride result, thereby may bias results higher than expected. Results should be scrutinised accordingly.

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW200_240313	0089_MW173_240313	0089_MW203_240313	----	----
				Sampling date / time	13-Mar-2024 08:20	13-Mar-2024 09:30	13-Mar-2024 09:43	----	----
Compound	CAS Number	LOR	Unit		EP2403299-001	EP2403299-002	EP2403299-003	--------	--------
					Result	Result	Result	----	----
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	<1	<1	----	----
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	<1	<1	----	----
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		439	393	337	----	----
Total Alkalinity as CaCO3	----	1	mg/L		439	393	337	----	----
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		194	64	99	----	----
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		2380	405	107	----	----
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		104	115	80	----	----
Magnesium	7439-95-4	1	mg/L		108	67	55	----	----
Sodium	7440-23-5	1	mg/L		1290	225	98	----	----
Potassium	7440-09-7	1	mg/L		72	17	10	----	----
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		79.9	20.6	11.8	----	----
ø Total Cations	----	0.01	meq/L		72.0	21.5	13.0	----	----
ø Ionic Balance	----	0.01	%		5.21	2.06	4.93	----	----
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		<0.02	0.12	<0.02	----	----
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		<0.02	0.07	0.02	----	----
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		<0.01	1.38	0.10	----	----
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		<0.02	0.23	<0.02	----	----
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		<0.01	2.70	<0.01	----	----
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	<0.02	<0.02	----	----

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW200_240313	0089_MW173_240313	0089_MW203_240313	----	----
				Sampling date / time	13-Mar-2024 08:20	13-Mar-2024 09:30	13-Mar-2024 09:43	----	----
Compound	CAS Number	LOR	Unit		EP2403299-001	EP2403299-002	EP2403299-003	--------	--------
					Result	Result	Result	----	----
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	**0.06**	<0.02	----	----
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		<0.02	**0.22**	<0.02	----	----
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		<0.02	**0.04**	<0.02	----	----
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		<0.01	**0.15**	<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	----	----
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									

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW200_240313	0089_MW173_240313	0089_MW203_240313	----	----
				Sampling date / time	13-Mar-2024 08:20	13-Mar-2024 09:30	13-Mar-2024 09:43	----	----
Compound	CAS Number	LOR	Unit		EP2403299-001	EP2403299-002	EP2403299-003	--------	--------
					Result	Result	Result	----	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
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	**4.97**	**0.12**	----	----
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		<0.01	**4.08**	**0.10**	----	----
Sum of PFAS (WA DER List)	----	0.01	µg/L		<0.01	**4.67**	**0.10**	----	----
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**123**	**118**	**119**	----	----
13C8-PFOA	----	0.02	%		**105**	**106**	**107**	----	----

Analytical Results

Sub-Matrix: RINSATE (Matrix: WATER)				Sample ID	0089_QC301_240313	0089_QC401_240313	0089_QC302_240313	0089_QC402_240313	----
				Sampling date / time	13-Mar-2024 10:03	13-Mar-2024 10:05	13-Mar-2024 10:07	13-Mar-2024 10:08	----
Compound	CAS Number	LOR	Unit		EP2403299-004	EP2403299-005	EP2403299-006	EP2403299-007	--------
					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		<0.01	<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	----
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		<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	----
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		<0.02	<0.02	<0.02	<0.02	----
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
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	----

Analytical Results

Sub-Matrix: RINSATE (Matrix: WATER)				Sample ID	0089_QC301_240313	0089_QC401_240313	0089_QC302_240313	0089_QC402_240313	----
				Sampling date / time	13-Mar-2024 10:03	13-Mar-2024 10:05	13-Mar-2024 10:07	13-Mar-2024 10:08	----
Compound	CAS Number	LOR	Unit		EP2403299-004	EP2403299-005	EP2403299-006	EP2403299-007	--------
					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	----
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		<0.01	<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	----
Sum of PFAS (WA DER List)	----	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	----
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**122**	**119**	**124**	**125**	----
13C8-PFOA	----	0.02	%		**110**	**121**	**110**	**108**	----

Surrogate Control Limits

Sub-Matrix: **GROUNDWATER**		Recovery Limits (%)	
Compound	*CAS Number*	**Low**	**High**
EP231S: PFAS Surrogate			
13C4-PFOS	----	65	140
13C8-PFOA	----	71	133

Sub-Matrix: **RINSATE**		Recovery Limits (%)	
Compound	*CAS Number*	**Low**	**High**
EP231S: PFAS Surrogate			
13C4-PFOS	----	65	140
13C8-PFOA	----	71	133

QUALITY CONTROL REPORT

Work Order	: **EP2403299**	Page	: 1 of 9
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: Customer Services EP
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: +61-8-9406 1301
Project	: WA_0089_PFASOMP_24	Date Samples Received	: 13-Mar-2024
Order number	: pfas-omp/Stirling	Date Analysis Commenced	: 15-Mar-2024
C-O-C number	: 65036	Issue Date	: 21-Mar-2024
Sampler	: [redacted] [redacted]		
Site	: Stirling GW - CG		
Quote number	: SY/139/19 B		
No. of samples received	: 7		
No. of samples analysed	: 7		

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]	Inorganics Supervisor	Perth Inorganics, Wangara, WA
[redacted]	Metals Chemist	Perth Inorganics, Wangara, WA
[redacted]	Senior Organic Chemist	Perth Organics, Wangara, WA

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 (%)
ED037P: Alkalinity by PC Titrator (QC Lot: 5665216)									
EP2403186-002	Anonymous	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	7	8	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	260	261	0.6	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	267	269	0.9	0% - 20%
EP2403298-002	Anonymous	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	490	494	0.8	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	490	494	0.8	0% - 20%
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QC Lot: 5665951)									
EP2403219-001	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	28	31	8.4	0% - 20%
EP2403224-008	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	2720	2720	0.0	0% - 20%
ED045G: Chloride by Discrete Analyser (QC Lot: 5665952)									
EP2403219-001	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	144	141	1.6	0% - 20%
EP2403224-008	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	21000	20800	1.3	0% - 20%
ED093F: Dissolved Major Cations (QC Lot: 5666301)									
EP2403299-001	0089_MW200_240313	ED093F: Calcium	7440-70-2	1	mg/L	104	105	0.0	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	108	108	0.0	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	1290	1290	0.2	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	72	73	0.0	0% - 20%
EP2403422-013	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	46	46	0.0	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	60	61	0.0	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	404	405	0.3	0% - 20%

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 (%)
ED093F: Dissolved Major Cations (QC Lot: 5666301) - continued									
EP2403422-013	Anonymous	ED093F: Potassium	7440-09-7	1	mg/L	18	19	0.0	0% - 50%
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 5669267)									
EP2403218-014	Anonymous	EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	0.34	0.32	7.1	0% - 20%
		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	<0.08	0.07	17.2	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	0.06	0.06	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
EP2403299-001	0089_MW200_240313	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
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 5669267)									
EP2403218-014	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	0.06	0.05	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
EP2403299-001	0089_MW200_240313	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 (%)*
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 5669267)									
EP2403218-014	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
EP2403299-001	0089_MW200_240313	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: 5669267)									
EP2403218-014	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
EP2403299-001	0089_MW200_240313	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

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: 5669267) - continued									
EP2403299-001	0089_MW200_240313	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: 5669267)									
EP2403218-014	Anonymous	EP231X: Sum of PFAS	----	0.01	µg/L	0.46	0.50	8.3	0% - 20%
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	0.34	0.32	6.1	0% - 20%
		EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	0.40	0.44	9.5	0% - 20%
EP2403299-001	0089_MW200_240313	EP231X: Sum of PFAS	----	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	<0.01	<0.01	0.0	No Limit

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
ED037P: Alkalinity by PC Titrator (QCLot: 5665216)								
ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	----	----	----	----
ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	----	----	----	----
ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	<1	----	----	----	----
ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	<1	20 mg/L	113	85.1	126
				<1	200 mg/L	108	90.5	111
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 5665951)								
ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<1	25 mg/L	102	89.9	112
				<1	500 mg/L	98.9	89.9	112
ED045G: Chloride by Discrete Analyser (QCLot: 5665952)								
ED045G: Chloride	16887-00-6	1	mg/L	<1	10 mg/L	97.1	88.6	113
				<1	1000 mg/L	93.8	88.6	113
ED093F: Dissolved Major Cations (QCLot: 5666301)								
ED093F: Calcium	7440-70-2	1	mg/L	<1	50 mg/L	100	86.5	117
ED093F: Magnesium	7439-95-4	1	mg/L	<1	50 mg/L	101	88.4	110
ED093F: Sodium	7440-23-5	1	mg/L	<1	50 mg/L	100.0	91.4	113
ED093F: Potassium	7440-09-7	1	mg/L	<1	50 mg/L	97.4	84.6	108
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5669267)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.2218 µg/L	102	72.0	130
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.2352 µg/L	93.3	71.0	127
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	0.2373 µg/L	95.4	68.0	131
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.238 µg/L	88.2	69.0	134
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.232 µg/L	97.0	65.0	140
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.241 µg/L	84.0	53.0	142
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5669267)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	1.25 µg/L	93.8	73.0	129
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	0.25 µg/L	101	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	96.2	72.0	130
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	0.25 µg/L	104	71.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	0.25 µg/L	100	69.0	130

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
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5669267) - continued								
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	0.25 µg/L	106	71.0	129
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	0.25 µg/L	113	69.0	133
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	0.25 µg/L	110	72.0	134
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	0.25 µg/L	108	65.0	144
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	0.25 µg/L	105	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5669267)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.25 µg/L	104	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	0.625 µg/L	96.8	68.0	141
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	0.625 µg/L	# 142	60.5	138
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	0.625 µg/L	100	68.3	134
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	0.625 µg/L	95.6	62.2	138
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	0.25 µg/L	114	65.0	136
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	0.25 µg/L	103	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5669267)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.2343 µg/L	103	63.0	143
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	0.2378 µg/L	104	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	0.24 µg/L	104	67.0	138
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	0.241 µg/L	81.7	64.2	133
EP231P: PFAS Sums (QCLot: 5669267)								
EP231X: Sum of PFAS	----	0.01	µg/L	<0.01	----	----	----	----
EP231X: Sum of PFHxS and PFOS	355-46-4/17 63-23-1	0.01	µg/L	<0.01	----	----	----	----
EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	<0.01	----	----	----	----

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
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 5665951)							
EP2403219-001	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	100 mg/L	85.5	70.4	130

Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
ED045G: Chloride by Discrete Analyser (QCLot: 5665952)							
EP2403219-001	Anonymous	ED045G: Chloride	16887-00-6	200 mg/L	109	70.0	130
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5669267)							
EP2403218-015	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.2218 µg/L	89.4	72.0	129
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.232 µg/L	103	71.0	127
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.2352 µg/L	110	68.0	129
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.238 µg/L	93.6	69.0	134
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.232 µg/L	125	65.0	140
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.241 µg/L	103	53.0	129
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5669267)							
EP2403218-015	Anonymous	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	1.25 µg/L	97.9	73.0	142
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.25 µg/L	122	72.0	129
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.25 µg/L	99.7	72.0	129
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.25 µg/L	87.3	72.0	130
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.25 µg/L	104	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	118	71.0	134
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.25 µg/L	116	69.0	133
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.25 µg/L	127	72.0	134
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.25 µg/L	114	65.0	144
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.25 µg/L	97.8	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5669267)							
EP2403218-015	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.25 µg/L	101	59.0	135
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.625 µg/L	114	70.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.625 µg/L	# 174	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.625 µg/L	100	70.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.625 µg/L	91.2	70.0	130
		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	114	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5669267)							
EP2403218-015	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.234 µg/L	109	63.0	143
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.2378 µg/L	103	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.24 µg/L	105	67.0	138
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.2415 µg/L	89.1	70.0	130

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **EP2403299**	Page	: 1 of 5
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Telephone	: +61-8-9406 1301
Project	: WA_0089_PFASOMP_24	Date Samples Received	: 13-Mar-2024
Site	: Stirling GW - CG	Issue Date	: 21-Mar-2024
Sampler	: [redacted]	No. of samples received	: 7
Order number	: pfas-omp/Stirling	No. of samples analysed	: 7

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.**
- **Laboratory Control outliers exist - please see following pages for full details.**
- **Matrix Spike outliers exist - please see following pages for full details.**
- **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.**

Outliers : Quality Control Samples

Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

Matrix: **WATER**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
Laboratory Control Spike (LCS) Recoveries							
EP231C: Perfluoroalkyl Sulfonamides	QC-5669267-002	----	**N-Ethyl perfluorooctane sulfonamide (EtFOSA)**	4151-50-2	142 %	60.5-138%	**Recovery greater than upper control limit**
Matrix Spike (MS) Recoveries							
EP231C: Perfluoroalkyl Sulfonamides	EP2403218--015	Anonymous	**N-Ethyl perfluorooctane sulfonamide (EtFOSA)**	4151-50-2	174 %	70.0-130%	**Recovery greater than upper data quality objective**

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
ED037P: Alkalinity by PC Titrator								
Clear Plastic Bottle - Natural (ED037-P)								
0089_MW200_240313, 0089_MW203_240313	0089_MW173_240313,	**13-Mar-2024**	**----**	----	----	**19-Mar-2024**	27-Mar-2024	✓
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA								
Clear Plastic Bottle - Natural (ED041G)								
0089_MW200_240313, 0089_MW203_240313	0089_MW173_240313,	**13-Mar-2024**	**----**	----	----	**21-Mar-2024**	10-Apr-2024	✓
ED045G: Chloride by Discrete Analyser								
Clear Plastic Bottle - Natural (ED045G)								
0089_MW200_240313, 0089_MW203_240313	0089_MW173_240313,	**13-Mar-2024**	**----**	----	----	**21-Mar-2024**	10-Apr-2024	✓
ED093F: Dissolved Major Cations								
Clear Plastic Bottle - Natural (ED093F)								
0089_MW200_240313, 0089_MW203_240313	0089_MW173_240313,	**13-Mar-2024**	**----**	----	----	**19-Mar-2024**	20-Mar-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
EP231A: Perfluoroalkyl Sulfonic Acids							
HDPE (no PTFE) (EP231X)							
0089_MW200_240313, 0089_MW203_240313, 0089_QC401_240313, 0089_QC402_240313, 0089_MW173_240313, 0089_QC301_240313, 0089_QC302_240313,	**13-Mar-2024**	**18-Mar-2024**	09-Sep-2024	✓	**18-Mar-2024**	09-Sep-2024	✓
EP231B: Perfluoroalkyl Carboxylic Acids							
HDPE (no PTFE) (EP231X)							
0089_MW200_240313, 0089_MW203_240313, 0089_QC401_240313, 0089_QC402_240313, 0089_MW173_240313, 0089_QC301_240313, 0089_QC302_240313,	**13-Mar-2024**	**18-Mar-2024**	09-Sep-2024	✓	**18-Mar-2024**	09-Sep-2024	✓
EP231C: Perfluoroalkyl Sulfonamides							
HDPE (no PTFE) (EP231X)							
0089_MW200_240313, 0089_MW203_240313, 0089_QC401_240313, 0089_QC402_240313, 0089_MW173_240313, 0089_QC301_240313, 0089_QC302_240313,	**13-Mar-2024**	**18-Mar-2024**	09-Sep-2024	✓	**18-Mar-2024**	09-Sep-2024	✓
EP231D: (n:2) Fluorotelomer Sulfonic Acids							
HDPE (no PTFE) (EP231X)							
0089_MW200_240313, 0089_MW203_240313, 0089_QC401_240313, 0089_QC402_240313, 0089_MW173_240313, 0089_QC301_240313, 0089_QC302_240313,	**13-Mar-2024**	**18-Mar-2024**	09-Sep-2024	✓	**18-Mar-2024**	09-Sep-2024	✓
EP231P: PFAS Sums							
HDPE (no PTFE) (EP231X)							
0089_MW200_240313, 0089_MW203_240313, 0089_QC401_240313, 0089_QC402_240313, 0089_MW173_240313, 0089_QC301_240313, 0089_QC302_240313,	**13-Mar-2024**	**18-Mar-2024**	09-Sep-2024	✓	**18-Mar-2024**	09-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)							
Alkalinity by Auto Titrator	ED037-P	2	19	**10.53**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	19	**10.53**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	2	19	**10.53**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	18	**11.11**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	19	**10.53**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Alkalinity by Auto Titrator	ED037-P	2	19	**10.53**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	19	**10.53**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	1	19	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	18	**5.56**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	19	**10.53**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Alkalinity by Auto Titrator	ED037-P	1	19	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	1	19	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	1	19	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	18	**5.56**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	19	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Chloride by Discrete Analyser	ED045G	1	19	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	18	**5.56**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	19	**5.26**	**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
Alkalinity by Auto Titrator	ED037-P	WATER	In house: Referenced to APHA 2320 B This procedure determines alkalinity by automated measurement (e.g. PC Titrate) on a settled supernatant aliquot of the sample using pH 4.5 for indicating the total alkalinity end-point. This method is compliant with NEPM Schedule B(3)
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	WATER	In house: Referenced to APHA 4500-SO4. Dissolved sulfate is determined in a 0.45um filtered sample. Sulfate ions are converted to a barium sulfate suspension in an acetic acid medium with barium chloride. Light absorbance of the BaSO4 suspension is measured by a photometer and the SO4-2 concentration is determined by comparison of the reading with a standard curve. This method is compliant with NEPM Schedule B(3)
Chloride by Discrete Analyser	ED045G	WATER	In house: Referenced to APHA 4500 Cl - G.The thiocyanate ion is liberated from mercuric thiocyanate through sequestration of mercury by the chloride ion to form non-ionised mercuric chloride. In the presence of ferric ions the liberated thiocynate forms highly-coloured ferric thiocynate which is measured at 480 nm.
Major Cations - Dissolved	ED093F	WATER	In house: Referenced to APHA 3120 and 3125; USEPA SW 846 - 6010 and 6020; Cations are determined by either ICP-AES or ICP-MS techniques. This method is compliant with NEPM Schedule B(3) Sodium Adsorption Ratio is calculated from Ca, Mg and Na which determined by ALS in house method QWI-EN/ED093F. This method is compliant with NEPM Schedule B(3) Hardness parameters are calculated based on APHA 2340 B. This method is compliant with NEPM Schedule B(3)
Ionic Balance by PCT DA and Turbi SO4 DA	* EN055 - PG	WATER	In house: Referenced to APHA 1030F. This method is compliant with NEPM Schedule B(3)
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.

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CHAIN OF CUSTODY RECORD

CLIENT DETAILS

Company Name : Stantec Australia	Contact Name : Maelle Bourdais	Purchase Order : 304700525/730	COC Number : 304700525/730 -03
Office Address : GF, 226 Adelaide Terrace, Perth WA 6000		PROJECT Number : WA_0089_PFASOMP_24	Eurofins | mgt quote ID :
	Email for COC/SRN/Results : [redacted] derp.labreports@esdat.com.au	PROJECT Name : WA_0089_PFASOMP_24	Data output format: PDF; ESDAT

Special Directions & Comments :
Please send ESdat files to derp.labreports@esdat.com.au with the project No in the header file

Please send invoice to SAPinvoices@stantec.com

Eurofins | mgt DI water batch number:

	Sample ID	Date	Matrix	PFAS (28 analytes)
1	0089_QC201_240311	11/03/2024	Water	X
2	0089_QC202_240311	11/03/2024	Water	X
3	0089_QC203_240311	11/03/2024	Water	X
4	0089_QC204_240311	11/03/2024	Water	X
5	0089_QC205_240311	11/03/2024	Water	X
6	0089_QC206_240311	11/03/2024	Soil	X
7	0089_QC207_240311	11/03/2024	Water	X
8	0089_QC208_240311	11/03/2024	Soil	X
9	0089_QC209_240311	11/03/2024	Water	X
10	0089_QC210_240312	12/03/2024	Soil	X
11	0089_QC211_240312	12/03/2024	Water	X
12	0089_QC212_240312	12/03/2024	Water	X
13	0089_QC213_240312	12/03/2024	Water	X
14	0089_QC214_240312	12/03/2024	Water	X
15	0089_QC215_240312	12/03/2024	Soil	X
16	0089_QC216_240312	12/03/2024	Water	X
17	0089_QC217_240312	12/03/2024	Water	X
18	0089_QC218_240312	12/03/2024	Water	X

Analytes

Some common holding times (with correct preservation).
For further information contact the lab

Waters		Soils	
BTEX, MAH, VOC	14 days	BTEX, MAH, VOC	14 days
TRH, PAH, Phenols, Pesticides	7 days	TRH, PAH, Phenols, Pesticides	14 days
Heavy Metals	6 months	Heavy Metals	6 months
Mercury, CrVI	28 days	Mercury, CrVI	28 days
Microbiological testing	24 hours	Microbiological testing	72 hours
BOD, Nitrate, Nitrite, Total N	2 days	Anions	28 days
Solids - TSS, TDS etc	7 days	SPOCAS, pH Field and FOX, CrS	24 hours
Ferrous iron	7 days	ASLP, TCLP	7 days

Containers:

1LP	250P	125P	1LA	40mL vial	125mL A	Jar		Sample comments:

Laboratory Staff

Relinquished By: Stantec Australia
Date & Time : 12/03/2024
Signature:

Received By: [redacted]
Date & Time : 11:27
Signature: [redacted]

Turn around time

1 DAY ☐ 2 DAY ☐ 3 DAY ☐
STANDARD ☑ Other:

Method Of Shipment

☑ Courier
☐ Hand Delivered
☐ Postal
Courier Consignment # :

Temperature on arrival: 18°

Report number: 1078840

www.eurofins.com.au EnviroSales@eurofins.com

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Sample Receipt Advice

Company name:	Stantec Australia Pty Ltd (WA)
Contact name:	[redacted]
Project name:	Not provided
Project ID:	WA_0089_PFASOMP_24
Turnaround time:	5 Day
Date/Time received	Mar 13, 2024 11:27 AM
Eurofins reference	1078840

Sample Information

✓	A detailed list of analytes logged into our LIMS, is included in the attached summary table.
✓	All samples have been received as described on the above COC.
✓	COC has been completed correctly.
✓	Attempt to chill was evident.
✓	Appropriately preserved sample containers have been used.
✓	All samples were received in good condition.
✓	Samples have been provided with adequate time to commence analysis in accordance with the relevant holding times.
✓	Appropriate sample containers have been used.
✓	Sample containers for volatile analysis received with zero headspace.
X	Split sample sent to requested external lab.
X	Some samples have been subcontracted.
N/A	Custody Seals intact (if used).

Notes

Contact

If you have any questions with respect to these samples, please contact your Analytical Services Manager:

[redacted] **on phone : 0892519602 or by email:** [redacted] **eurofins.com**

Results will be delivered electronically via email to [redacted] - [redacted] stantec.com.

Note: A copy of these results will also be delivered to the general Stantec Australia Pty Ltd (WA) email address.

Global Leader - Results you can trust

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email: EnviroSales@eurofins.com

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Company Name: Stantec Australia Pty Ltd (WA)
Address: 6F 226,Adelaide Terrace
Perth
WA 6000

Project Name:
Project ID: WA_0089_PFASOMP_24

Order No.: 304700525/730
Report #: 1078840
Phone: [redacted]
Fax:

Received: Mar 13, 2024 11:27 AM
Due: Mar 20, 2024
Priority: 5 Day
Contact Name: [redacted]

Eurofins Analytical Services Manager : [redacted]

Sample Detail						Moisture Set	Per- and Polyfluoroalkyl Substances (PFASs)	Per- and Polyfluoroalkyl Substances (PFASs)
Perth Laboratory - NATA # 2377 Site # 2370						X	X	X
Melbourne Laboratory - NATA # 1261 Site # 1254							X	X
External Laboratory								
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**			
1	0089_QC201_240311	Mar 11, 2024		Water	L24-Ma0038988		X	
2	0089_QC202_240311	Mar 11, 2024		Water	L24-Ma0038989		X	
3	0089_QC203_240311	Mar 11, 2024		Water	L24-Ma0038990		X	
4	0089_QC204_240311	Mar 11, 2024		Water	L24-Ma0038991		X	
5	0089_QC205_240311	Mar 11, 2024		Water	L24-Ma0038992		X	
6	0089_QC206_240311	Mar 11, 2024		Soil	L24-Ma0038993	X		X
7	0089_QC207_240311	Mar 11, 2024		Water	L24-Ma0038994		X	

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Company Name: Stantec Australia Pty Ltd (WA)
Address: 6F 226,Adelaide Terrace
Perth
WA 6000

Project Name:
Project ID: WA_0089_PFASOMP_24

Order No.: 304700525/730
Report #: 1078840
Phone: [redacted]
Fax:

Received: Mar 13, 2024 11:27 AM
Due: Mar 20, 2024
Priority: 5 Day
Contact Name: [redacted]

Eurofins Analytical Services Manager : [redacted]

Sample Detail						Moisture Set	Per- and Polyfluoroalkyl Substances (PFASs)	Per- and Polyfluoroalkyl Substances (PFASs)
Perth Laboratory - NATA # 2377 Site # 2370						X	X	X
Melbourne Laboratory - NATA # 1261 Site # 1254							X	X
External Laboratory								
8	0089_QC208_240311	Mar 11, 2024		Soil	L24-Ma0038995	X		X
9	0089_QC209_240311	Mar 11, 2024		Water	L24-Ma0038996		X	
10	0089_QC210_240312	Mar 12, 2024		Soil	L24-Ma0038997	X		X
11	0089_QC211_240312	Mar 12, 2024		Water	L24-Ma0038998		X	
12	0089_QC212_240312	Mar 12, 2024		Water	L24-Ma0038999		X	
13	0089_QC213_240312	Mar 12, 2024		Water	L24-Ma0039000		X	
14	0089_QC214_240312	Mar 12, 2024		Water	L24-Ma0039001		X	
15	0089_QC215_240312	Mar 12, 2024		Soil	L24-Ma0039002	X		X

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Company Name: Stantec Australia Pty Ltd (WA)
Address: 6F 226,Adelaide Terrace
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WA 6000

Project Name:
Project ID: WA_0089_PFASOMP_24

Order No.: 304700525/730
Report #: 1078840
Phone: [redacted]
Fax:

Received: Mar 13, 2024 11:27 AM
Due: Mar 20, 2024
Priority: 5 Day
Contact Name: [redacted]

Eurofins Analytical Services Manager : [redacted]

Sample Detail						Moisture Set	Per- and Polyfluoroalkyl Substances (PFASs)	Per- and Polyfluoroalkyl Substances (PFASs)
Perth Laboratory - NATA # 2377 Site # 2370						X	X	X
Melbourne Laboratory - NATA # 1261 Site # 1254							X	X
External Laboratory								
16	0089_QC216_240312	Mar 12, 2024		Water	L24-Ma0039003		X	
17	0089_QC217_240312	Mar 12, 2024		Water	L24-Ma0039004		X	
18	0089_QC218_240312	Mar 12, 2024		Water	L24-Ma0039005		X	
Test Counts						4	14	4

Stantec Australia Pty Limited
6F 226,Adelaide Terrace
Perth
WA 6000

NATA Accredited
Accreditation Number 2377
Site Number 2370

Accredited for compliance with ISO/IEC 17025 – Testing
NATA is a signatory to the ILAC Mutual Recognition Arrangement for the mutual recognition of the equivalence of testing, medical testing, calibration, inspection, proficiency testing scheme providers and reference materials producers reports and certificates.

Attention: [redacted]

Report **1078840-S**
Project name
Project ID WA_0089_PFASOMP_24
Received Date Mar 13, 2024

Client Sample ID			**0089_QC206_240311**	**0089_QC208_240311**	**0089_QC210_240312**	**0089_QC215_240312**
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins Sample No.			**L24-Ma0038993**	**L24-Ma0038995**	**L24-Ma0038997**	**L24-Ma0039002**
Date Sampled			**Mar 11, 2024**	**Mar 11, 2024**	**Mar 12, 2024**	**Mar 12, 2024**
Test/Reference	LOR	Unit				
Sample Properties						
% Moisture	1	%	6.7	31	31	22
Perfluoroalkyl carboxylic acids (PFCAs)						
Perfluorobutanoic acid (PFBA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluoropentanoic acid (PFPeA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluorohexanoic acid (PFHxA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluoroheptanoic acid (PFHpA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluorooctanoic acid (PFOA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluorononanoic acid (PFNA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluorodecanoic acid (PFDA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluoroundecanoic acid (PFUnDA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluorododecanoic acid (PFDoDA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluorotridecanoic acid (PFTrDA)[N15]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluorotetradecanoic acid (PFTeDA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
13C4-PFBA (surr.)	1	%	63	59	61	59
13C5-PFPeA (surr.)	1	%	86	75	80	80
13C5-PFHxA (surr.)	1	%	84	79	85	75
13C4-PFHpA (surr.)	1	%	93	72	80	77
13C8-PFOA (surr.)	1	%	83	80	81	77
13C5-PFNA (surr.)	1	%	94	73	80	80
13C6-PFDA (surr.)	1	%	90	79	87	84
13C2-PFUnDA (surr.)	1	%	91	82	79	85
13C2-PFDoDA (surr.)	1	%	91	78	88	86
13C2-PFTeDA (surr.)	1	%	114	97	98	101
Perfluoroalkyl sulfonamido substances						
Perfluorooctane sulfonamide (FOSA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)[N11]	10	ug/kg	< 10	< 10	< 10	< 10
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)[N11]	10	ug/kg	< 10	< 10	< 10	< 10

Client Sample ID			0089_QC206_240311	0089_QC208_240311	0089_QC210_240312	0089_QC215_240312
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			L24-Ma0038993	L24-Ma0038995	L24-Ma0038997	L24-Ma0039002
Date Sampled			Mar 11, 2024	Mar 11, 2024	Mar 12, 2024	Mar 12, 2024
Test/Reference	LOR	Unit				
Perfluoroalkyl sulfonamido substances						
13C8-FOSA (surr.)	1	%	102	90	92	92
D3-N-MeFOSA (surr.)	1	%	116	97	104	99
D5-N-EtFOSA (surr.)	1	%	131	114	119	116
D7-N-MeFOSE (surr.)	1	%	106	86	91	93
D9-N-EtFOSE (surr.)	1	%	110	92	101	101
D5-N-EtFOSAA (surr.)	1	%	97	86	90	84
D3-N-MeFOSAA (surr.)	1	%	98	84	80	79
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)						
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)[N11]	10	ug/kg	< 10	< 10	< 10	< 10
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
13C2-4:2 FTSA (surr.)	1	%	89	70	78	75
13C2-6:2 FTSA (surr.)	1	%	92	82	79	77
13C2-8:2 FTSA (surr.)	1	%	87	91	81	74
13C2-10:2 FTSA (surr.)	1	%	104	81	81	98
Perfluoroalkyl sulfonic acids (PFSAs)						
Perfluorobutanesulfonic acid (PFBS)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluorononanesulfonic acid (PFNS)*[N15]	5	ug	< 5	< 5	< 5	< 5
Perfluoropropanesulfonic acid (PFPrS)*[N15]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluoropentanesulfonic acid (PFPeS)[N15]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluorohexanesulfonic acid (PFHxS)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluoroheptanesulfonic acid (PFHpS)[N15]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluorooctanesulfonic acid (PFOS)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluorodecanesulfonic acid (PFDS)[N15]	5	ug/kg	< 5	< 5	< 5	< 5
13C3-PFBS (surr.)	1	%	84	80	76	70
18O2-PFHxS (surr.)	1	%	77	77	80	80
13C8-PFOS (surr.)	1	%	94	82	81	82
PFASs Summations						
Sum (PFHxS + PFOS)*	5	ug/kg	< 5	< 5	< 5	< 5
Sum of PFASs (n=30)*	50	ug/kg	< 50	< 50	< 50	< 50
Sum of US EPA PFAS (PFOS + PFOA)*	5	ug/kg	< 5	< 5	< 5	< 5
Sum of enHealth PFAS (PFHxS + PFOS + PFOA)*	5	ug/kg	< 5	< 5	< 5	< 5
Sum of WA DWER PFAS (n=10)*	10	ug/kg	< 10	< 10	< 10	< 10

Sample History

Where samples are submitted/analysed over several days, the last date of extraction is reported.

If the date and time of sampling are not provided, the Laboratory will not be responsible for compromised results should testing be performed outside the recommended holding time.

Description	Testing Site	Extracted	Holding Time
% Moisture	Welshpool	Mar 16, 2024	14 Days
- Method: ARL135 Moisture in Solids			
Perfluoroalkyl carboxylic acids (PFCAs)	Welshpool	Mar 18, 2024	28 Days
- Method: Method ARL0510_ARL0511 PFAS in aqueous & solid samples by LC-MS/MS			
Perfluoroalkyl sulfonamido substances	Welshpool	Mar 18, 2024	28 Days
- Method: Method ARL0510_ARL0511 PFAS in aqueous & solid samples by LC-MS/MS			
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)	Welshpool	Mar 18, 2024	28 Days
- Method: Method ARL0510_ARL0511 PFAS in aqueous & solid samples by LC-MS/MS			
Perfluoroalkyl sulfonic acids (PFSAs)	Welshpool	Mar 18, 2024	28 Days
- Method: Method ARL0510_ARL0511 PFAS in aqueous & solid samples by LC-MS/MS			
PFASs Summations	Welshpool	Mar 18, 2024	
- Method: Method ARL0510_ARL0511 PFAS in aqueous & solid samples by LC-MS/MS			

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Company Name: Stantec Australia Pty Ltd (WA)
Address: 6F 226,Adelaide Terrace
Perth
WA 6000

Project Name:
Project ID: WA_0089_PFASOMP_24

Order No.: 304700525/730
Report #: 1078840
Phone: 0458 839 200
Fax:

Received: Mar 13, 2024 11:27 AM
Due: Mar 20, 2024
Priority: 5 Day
Contact Name: [redacted]

Eurofins Analytical Services Manager : [redacted]

Sample Detail						Moisture Set	Per- and Polyfluoroalkyl Substances (PFASs)	Per- and Polyfluoroalkyl Substances (PFASs)
Perth Laboratory - NATA # 2377 Site # 2370						X	X	X
Melbourne Laboratory - NATA # 1261 Site # 1254							X	X
External Laboratory								
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**			
1	0089_QC201_240311	Mar 11, 2024		Water	L24-Ma0038988		X	
2	0089_QC202_240311	Mar 11, 2024		Water	L24-Ma0038989		X	
3	0089_QC203_240311	Mar 11, 2024		Water	L24-Ma0038990		X	
4	0089_QC204_240311	Mar 11, 2024		Water	L24-Ma0038991		X	
5	0089_QC205_240311	Mar 11, 2024		Water	L24-Ma0038992		X	
6	0089_QC206_240311	Mar 11, 2024		Soil	L24-Ma0038993	X		X
7	0089_QC207_240311	Mar 11, 2024		Water	L24-Ma0038994		X	

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Sample Detail						Moisture Set	Per- and Polyfluoroalkyl Substances (PFASs)	Per- and Polyfluoroalkyl Substances (PFASs)
Perth Laboratory - NATA # 2377 Site # 2370						X	X	X
Melbourne Laboratory - NATA # 1261 Site # 1254							X	X
External Laboratory								
8	0089_QC208_240311	Mar 11, 2024		Soil	L24-Ma0038995	X		X
9	0089_QC209_240311	Mar 11, 2024		Water	L24-Ma0038996		X	
10	0089_QC210_240312	Mar 12, 2024		Soil	L24-Ma0038997	X		X
11	0089_QC211_240312	Mar 12, 2024		Water	L24-Ma0038998		X	
12	0089_QC212_240312	Mar 12, 2024		Water	L24-Ma0038999		X	
13	0089_QC213_240312	Mar 12, 2024		Water	L24-Ma0039000		X	
14	0089_QC214_240312	Mar 12, 2024		Water	L24-Ma0039001		X	
15	0089_QC215_240312	Mar 12, 2024		Soil	L24-Ma0039002	X		X

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Sample Detail						Moisture Set	Per- and Polyfluoroalkyl Substances (PFASs)	Per- and Polyfluoroalkyl Substances (PFASs)
Perth Laboratory - NATA # 2377 Site # 2370						X	X	X
Melbourne Laboratory - NATA # 1261 Site # 1254							X	X
External Laboratory								
16	0089_QC216_240312	Mar 12, 2024		Water	L24-Ma0039003		X	
17	0089_QC217_240312	Mar 12, 2024		Water	L24-Ma0039004		X	
18	0089_QC218_240312	Mar 12, 2024		Water	L24-Ma0039005		X	
Test Counts						4	14	4

Internal Quality Control Review and Glossary

General

1. Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples follow guidelines delineated in the National Environment Protection (Assessment of Site Contamination) Measure 1999, as amended May 2013. They are included in this QC report where applicable. Additional QC data may be available on request.
2. Unless otherwise stated, all soil/sediment/solid results are reported on a dry weight basis.
3. Unless otherwise stated, all biota/food results are reported on a wet weight basis on the edible portion.
4. For CEC results where the sample's origin is unknown or environmentally contaminated, the results should be used advisedly.
5. Actual LORs are matrix dependent. Quoted LORs may be raised where sample extracts are diluted due to interferences.
6. Results are uncorrected for matrix spikes or surrogate recoveries except for PFAS compounds where annotated.
7. SVOC analysis on waters is performed on homogenised, unfiltered samples unless noted otherwise.
8. Samples were analysed on an 'as received' basis.
9. Information identified in this report with **blue** colour indicates data provided by customers that may have an impact on the results.
10. This report replaces any interim results previously issued.

Holding Times

Please refer to the 'Sample Preservation and Container Guide' for holding times (QS3001).

For samples received on the last day of holding time, notification of testing requirements should have been received at least 6 hours before sample receipt deadlines as stated on the SRA.

If the Laboratory did not receive the information in the required timeframe, and despite any other integrity issues, suitably qualified results may still be reported.

Holding times apply from the sampling date; therefore, compliance with these may be outside the laboratory's control.

For VOCs containing vinyl chloride, styrene and 2-chloroethyl vinyl ether, the holding time is seven days; however, for all other VOCs, such as BTEX or C6-10 TRH, the holding time is 14 days.

Units

mg/kg: milligrams per kilogram	**mg/L:** milligrams per litre	**ppm:** parts per million
µg/L: micrograms per litre	**ppb:** parts per billion	**%:** Percentage
org/100 mL: Organisms per 100 millilitres	**NTU:** Nephelometric Turbidity Units	**MPN/100 mL:** Most Probable Number of organisms per 100 millilitres
CFU: Colony Forming Unit	**Colour:** Pt-Co Units (CU)	

Terms

APHA	American Public Health Association
CEC	Cation Exchange Capacity
COC	Chain of Custody
CP	Client Parent - QC was performed on samples pertaining to this report
CRM	Certified Reference Material (ISO17034) - reported as percent recovery.
Dry	Where moisture has been determined on a solid sample, the result is expressed on a dry weight basis.
Duplicate	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
LOR	Limit of Reporting.
LCS	Laboratory Control Sample - reported as percent recovery.
Method Blank	In the case of solid samples, these are performed on laboratory-certified clean sands and in the case of water samples, these are performed on de-ionised water.
NCP	Non-Client Parent - QC performed on samples not pertaining to this report, QC represents the sequence or batch that client samples were analysed within.
RPD	Relative Percent Difference between two Duplicate pieces of analysis.
SPIKE	Addition of the analyte to the sample and reported as percentage recovery.
SRA	Sample Receipt Advice
Surr - Surrogate	The addition of a similar compound to the analyte target is reported as percentage recovery. See below for acceptance criteria.
TBTO	Tributyltin oxide (*bis*-tributyltin oxide) - individual tributyltin compounds cannot be identified separately in the environment; however, free tributyltin was measured, and its values were converted stoichiometrically into tributyltin oxide for comparison with regulatory limits.
TCLP	Toxicity Characteristic Leaching Procedure
TEQ	Toxic Equivalency Quotient or Total Equivalence
QSM	US Department of Defense Quality Systems Manual Version 6.0
US EPA	United States Environmental Protection Agency
WA DWER	Sum of PFBA, PFPeA, PFHxA, PFHpA, PFOA, PFBS, PFHxS, PFOS, 6:2 FTSA, 8:2 FTSA

QC - Acceptance Criteria

The acceptance criteria should only be used as a guide and may be different when site-specific Sampling Analysis and Quality Plan (SAQP) have been implemented.

RPD Duplicates: Global RPD Duplicates Acceptance Criteria is ≤30%; however, the following acceptance guidelines are equally applicable:

Results <10 times the LOR:	No Limit
Results between 10-20 times the LOR:	RPD must lie between 0-50%
Results >20 times the LOR:	RPD must lie between 0-30%

NOTE: pH duplicates are reported as a range, not as RPD

Surrogate Recoveries: Recoveries must lie between 20-130% for Speciated Phenols & 50-150% for PFAS. SVOCs recoveries 20 – 150%, VOC recoveries 50 – 150%

PFAS field samples containing surrogate recoveries above the QC limit designated in QSM 6.0, where no positive PFAS results have been reported or reviewed, and no data was affected.

QC Data General Comments

1. Where a result is reported as less than (<), higher than the nominated LOR, this is due to either matrix interference, extract dilution required due to interferences or contaminant levels within the sample, high moisture content or insufficient sample provided.
2. Duplicate data shown within this report that states the word "BATCH" is a Batch Duplicate from outside of your sample batch but within the laboratory sample batch at a 1:10 ratio. The Parent and Duplicate data shown are not data from your samples.
3. pH and Free Chlorine analysed in the laboratory - Analysis on this test must begin within 30 minutes of sampling. Therefore, laboratory analysis is unlikely to be completed within holding time.Analysis will begin as soon as possible after sample receipt.
4. Recovery Data (Spikes & Surrogates) - where chromatographic interference does not allow the determination of recovery, the term "INT" appears against that analyte.
5. For Matrix Spikes and LCS results, a dash "-" in the report means that the specific analyte was not added to the QC sample.
6. Duplicate RPDs are calculated from raw analytical data; thus, it is possible to have two sets of data.

Quality Control Results

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Method Blank							
Perfluoroalkyl carboxylic acids (PFCAs)							
Perfluorobutanoic acid (PFBA)	ug/kg	< 5			5	Pass	
Perfluoropentanoic acid (PFPeA)	ug/kg	< 5			5	Pass	
Perfluorohexanoic acid (PFHxA)	ug/kg	< 5			5	Pass	
Perfluoroheptanoic acid (PFHpA)	ug/kg	< 5			5	Pass	
Perfluorooctanoic acid (PFOA)	ug/kg	< 5			5	Pass	
Perfluorononanoic acid (PFNA)	ug/kg	< 5			5	Pass	
Perfluorodecanoic acid (PFDA)	ug/kg	< 5			5	Pass	
Perfluoroundecanoic acid (PFUnDA)	ug/kg	< 5			5	Pass	
Perfluorododecanoic acid (PFDoDA)	ug/kg	< 5			5	Pass	
Perfluorotridecanoic acid (PFTrDA)	ug/kg	< 5			5	Pass	
Perfluorotetradecanoic acid (PFTeDA)	ug/kg	< 5			5	Pass	
Method Blank							
Perfluoroalkyl sulfonamido substances							
Perfluorooctane sulfonamide (FOSA)	ug/kg	< 5			5	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	ug/kg	< 5			5	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	ug/kg	< 5			5	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)	ug/kg	< 5			5	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)	ug/kg	< 5			5	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	ug/kg	< 10			10	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	ug/kg	< 10			10	Pass	
Method Blank							
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)							
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	ug/kg	< 5			5	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)	ug/kg	< 10			10	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	ug/kg	< 5			5	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	ug/kg	< 5			5	Pass	
Method Blank							
Perfluoroalkyl sulfonic acids (PFSAs)							
Perfluorobutanesulfonic acid (PFBS)	ug/kg	< 5			5	Pass	
Perfluorononanesulfonic acid (PFNS)*	ug	< 5			5	Pass	
Perfluoropropanesulfonic acid (PFPrS)*	ug/kg	< 5			5	Pass	
Perfluoropentanesulfonic acid (PFPeS)	ug/kg	< 5			5	Pass	
Perfluorohexanesulfonic acid (PFHxS)	ug/kg	< 5			5	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	ug/kg	< 5			5	Pass	
Perfluorooctanesulfonic acid (PFOS)	ug/kg	< 5			5	Pass	
Perfluorodecanesulfonic acid (PFDS)	ug/kg	< 5			5	Pass	
LCS - % Recovery							
Perfluoroalkyl carboxylic acids (PFCAs)							
Perfluorobutanoic acid (PFBA)	%	86			50-150	Pass	
Perfluoropentanoic acid (PFPeA)	%	96			50-150	Pass	
Perfluorohexanoic acid (PFHxA)	%	96			50-150	Pass	
Perfluoroheptanoic acid (PFHpA)	%	82			50-150	Pass	
Perfluorooctanoic acid (PFOA)	%	89			50-150	Pass	
Perfluorononanoic acid (PFNA)	%	87			50-150	Pass	
Perfluorodecanoic acid (PFDA)	%	88			50-150	Pass	
Perfluoroundecanoic acid (PFUnDA)	%	90			50-150	Pass	
Perfluorododecanoic acid (PFDoDA)	%	86			50-150	Pass	
Perfluorotridecanoic acid (PFTrDA)	%	86			50-150	Pass	
Perfluorotetradecanoic acid (PFTeDA)	%	92			50-150	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
LCS - % Recovery							
Perfluoroalkyl sulfonamido substances							
Perfluorooctane sulfonamide (FOSA)	%	87			50-150	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	%	79			50-150	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	%	81			50-150	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)	%	90			50-150	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)	%	90			50-150	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	%	81			50-150	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	%	84			50-150	Pass	
LCS - % Recovery							
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)							
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	%	85			50-150	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)	%	85			50-150	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	%	88			50-150	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	%	87			50-150	Pass	
LCS - % Recovery							
Perfluoroalkyl sulfonic acids (PFSAs)							
Perfluorobutanesulfonic acid (PFBS)	%	96			50-150	Pass	
Perfluorononanesulfonic acid (PFNS)*	%	82			50-150	Pass	
Perfluoropropanesulfonic acid (PFPrS)*	%	84			50-150	Pass	
Perfluoropentanesulfonic acid (PFPeS)	%	77			50-150	Pass	
Perfluorohexanesulfonic acid (PFHxS)	%	87			50-150	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	%	85			50-150	Pass	
Perfluorooctanesulfonic acid (PFOS)	%	90			50-150	Pass	
Perfluorodecanesulfonic acid (PFDS)	%	90			50-150	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Spike - % Recovery									
Perfluoroalkyl carboxylic acids (PFCAs)				Result 1					
Perfluorobutanoic acid (PFBA)	L24-Ma0039108	NCP	%	84			50-150	Pass	
Perfluoropentanoic acid (PFPeA)	L24-Ma0039108	NCP	%	118			50-150	Pass	
Perfluorohexanoic acid (PFHxA)	L24-Ma0039108	NCP	%	101			50-150	Pass	
Perfluoroheptanoic acid (PFHpA)	L24-Ma0039108	NCP	%	95			50-150	Pass	
Perfluorooctanoic acid (PFOA)	L24-Ma0039108	NCP	%	89			50-150	Pass	
Perfluorononanoic acid (PFNA)	L24-Ma0039108	NCP	%	91			50-150	Pass	
Perfluorodecanoic acid (PFDA)	L24-Ma0039108	NCP	%	87			50-150	Pass	
Perfluoroundecanoic acid (PFUnDA)	L24-Ma0039108	NCP	%	88			50-150	Pass	
Perfluorododecanoic acid (PFDoDA)	L24-Ma0039108	NCP	%	89			50-150	Pass	
Perfluorotridecanoic acid (PFTrDA)	L24-Ma0039108	NCP	%	82			50-150	Pass	
Perfluorotetradecanoic acid (PFTeDA)	L24-Ma0039108	NCP	%	87			50-150	Pass	
Spike - % Recovery									
Perfluoroalkyl sulfonamido substances				Result 1					
Perfluorooctane sulfonamide (FOSA)	L24-Ma0039108	NCP	%	84			50-150	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	L24-Ma0039108	NCP	%	83			50-150	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	L24-Ma0039108	NCP	%	86			50-150	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)	L24-Ma0039108	NCP	%	93			50-150	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)	L24-Ma0039108	NCP	%	90			50-150	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	L24-Ma0039108	NCP	%	86			50-150	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	L24-Ma0039108	NCP	%	83			50-150	Pass	
Spike - % Recovery									
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)				Result 1					
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	L24-Ma0039108	NCP	%	80			50-150	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)	L24-Ma0039108	NCP	%	90			50-150	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	L24-Ma0039108	NCP	%	93			50-150	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	L24-Ma0039108	NCP	%	72			50-150	Pass	
Spike - % Recovery									
Perfluoroalkyl sulfonic acids (PFSAs)				Result 1					
Perfluorobutanesulfonic acid (PFBS)	L24-Ma0039108	NCP	%	116			50-150	Pass	
Perfluorononanesulfonic acid (PFNS)*	L24-Ma0039108	NCP	%	97			50-150	Pass	
Perfluoropropanesulfonic acid (PFPrS)*	L24-Ma0039108	NCP	%	105			50-150	Pass	
Perfluoropentanesulfonic acid (PFPeS)	L24-Ma0039108	NCP	%	98			50-150	Pass	
Perfluorohexanesulfonic acid (PFHxS)	L24-Ma0039108	NCP	%	87			50-150	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	L24-Ma0039108	NCP	%	88			50-150	Pass	
Perfluorooctanesulfonic acid (PFOS)	L24-Ma0039108	NCP	%	88			50-150	Pass	
Perfluorodecanesulfonic acid (PFDS)	L24-Ma0039108	NCP	%	102			50-150	Pass	
Test	**Lab Sample ID**	**QA Source**	**Units**	**Result 1**			**Acceptance Limits**	**Pass Limits**	**Qualifying Code**
Duplicate									
Sample Properties				Result 1	Result 2	RPD			
% Moisture	L24-Ma0039142	NCP	%	6.5	6.4	1.5	30%	Pass	
Duplicate									
Perfluoroalkyl carboxylic acids (PFCAs)				Result 1	Result 2	RPD			
Perfluorobutanoic acid (PFBA)	L24-Ma0039307	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluoropentanoic acid (PFPeA)	L24-Ma0039307	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorohexanoic acid (PFHxA)	L24-Ma0039307	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluoroheptanoic acid (PFHpA)	L24-Ma0039307	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorooctanoic acid (PFOA)	L24-Ma0039307	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorononanoic acid (PFNA)	L24-Ma0039307	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorodecanoic acid (PFDA)	L24-Ma0039307	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluoroundecanoic acid (PFUnDA)	L24-Ma0039307	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorododecanoic acid (PFDoDA)	L24-Ma0039307	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorotridecanoic acid (PFTrDA)	L24-Ma0039307	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorotetradecanoic acid (PFTeDA)	L24-Ma0039307	NCP	ug/kg	< 5	< 5	<1	30%	Pass	

Duplicate									
Perfluoroalkyl sulfonamido substances				Result 1	Result 2	RPD			
Perfluorooctane sulfonamide (FOSA)	L24-Ma0039307	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	L24-Ma0039307	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	L24-Ma0039307	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)	L24-Ma0039307	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)	L24-Ma0039307	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	L24-Ma0039307	NCP	ug/kg	< 10	< 10	<1	30%	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	L24-Ma0039307	NCP	ug/kg	< 10	< 10	<1	30%	Pass	
Duplicate									
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)				Result 1	Result 2	RPD			
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	L24-Ma0039307	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)	L24-Ma0039307	NCP	ug/kg	< 10	< 10	<1	30%	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	L24-Ma0039307	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	L24-Ma0039307	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
Duplicate									
Perfluoroalkyl sulfonic acids (PFSAs)				Result 1	Result 2	RPD			
Perfluorobutanesulfonic acid (PFBS)	L24-Ma0039307	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorononanesulfonic acid (PFNS)*	L24-Ma0039307	NCP	ug	< 5	< 5	<1	30%	Pass	
Perfluoropropanesulfonic acid (PFPrS)*	L24-Ma0039307	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluoropentanesulfonic acid (PFPeS)	L24-Ma0039307	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorohexanesulfonic acid (PFHxS)	L24-Ma0039307	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	L24-Ma0039307	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorooctanesulfonic acid (PFOS)	L24-Ma0039307	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorodecanesulfonic acid (PFDS)	L24-Ma0039307	NCP	ug/kg	< 5	< 5	<1	30%	Pass	

Comments

Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	Yes
Sample correctly preserved	Yes
Appropriate sample containers have been used	Yes
Sample containers for volatile analysis received with minimal headspace	Yes
Samples received within HoldingTime	Yes
Some samples have been subcontracted	No

Qualifier Codes/Comments

Code	Description
N11	Isotope dilution is used for calibration of each native compound for which an exact labelled analogue is available (Isotope Dilution Quantitation). The isotopically labelled analogues allow identification and recovery correction of the concentration of the associated native PFAS compounds.
N15	Where the native PFAS compound does not have labelled analogue then the quantification is made using the Extracted Internal Standard Analyte with the closest retention time to the analyte and no recovery correction has been made (Internal Standard Quantitation).

Authorised by:

[redacted] Analytical Services Manager
[redacted] Senior Analyst-Sample Properties
[redacted] Senior Analyst-PFAS

[redacted]

[redacted]

General Manager

- Indicates Not Requested

* Indicates NATA accreditation does not cover the performance of this service

Measurement uncertainty of test data is available on request

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Stantec Australia Pty Limited
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WA 6000

NATA Accredited
Accreditation Number 2377
Site Number 2370

Accredited for compliance with ISO/IEC 17025 – Testing
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Attention: [redacted]

Report **1078840-W**
Project name
Project ID WA_0089_PFASOMP_24
Received Date Mar 13, 2024

Client Sample ID			0089_QC201_240311	0089_QC202_240311	0089_QC203_240311	0089_QC204_240311
Sample Matrix			**Water**	**Water**	**Water**	**Water**
Eurofins Sample No.			**L24-Ma0038988**	**L24-Ma0038989**	**L24-Ma0038990**	**L24-Ma0038991**
Date Sampled			**Mar 11, 2024**	**Mar 11, 2024**	**Mar 11, 2024**	**Mar 11, 2024**
Test/Reference	LOR	Unit				
Perfluoroalkyl carboxylic acids (PFCAs)						
Perfluorobutanoic acid (PFBA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
Perfluoropentanoic acid (PFPeA)[N11]	0.01	ug/L	0.02	0.03	0.02	0.04
Perfluorohexanoic acid (PFHxA)[N11]	0.01	ug/L	0.06	0.04	0.02	0.04
Perfluoroheptanoic acid (PFHpA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
Perfluorooctanoic acid (PFOA)[N11]	0.01	ug/L	0.05	< 0.01	< 0.01	< 0.01
Perfluorononanoic acid (PFNA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorodecanoic acid (PFDA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluoroundecanoic acid (PFUnDA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorododecanoic acid (PFDoDA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorotridecanoic acid (PFTrDA)[N15]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorotetradecanoic acid (PFTeDA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
13C4-PFBA (surr.)	1	%	98	27	27	16
13C5-PFPeA (surr.)	1	%	159	72	78	49
13C5-PFHxA (surr.)	1	%	165	81	82	52
13C4-PFHpA (surr.)	1	%	155	73	79	43
13C8-PFOA (surr.)	1	%	157	75	84	51
13C5-PFNA (surr.)	1	%	149	72	85	52
13C6-PFDA (surr.)	1	%	134	64	78	43
13C2-PFUnDA (surr.)	1	%	122	58	74	37
13C2-PFDoDA (surr.)	1	%	123	53	66	32
13C2-PFTeDA (surr.)	1	%	59	17	24	13
Perfluoroalkyl sulfonamido substances						
Perfluorooctane sulfonamide (FOSA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
13C8-FOSA (surr.)	1	%	134	67	80	45
D3-N-MeFOSA (surr.)	1	%	137	67	84	41

Client Sample ID			0089_QC201_240311	0089_QC202_240311	0089_QC203_240311	0089_QC204_240311
Sample Matrix			Water	Water	Water	Water
Eurofins Sample No.			L24-Ma0038988	L24-Ma0038989	L24-Ma0038990	L24-Ma0038991
Date Sampled			Mar 11, 2024	Mar 11, 2024	Mar 11, 2024	Mar 11, 2024
Test/Reference	LOR	Unit				
Perfluoroalkyl sulfonamido substances						
D5-N-EtFOSA (surr.)	1	%	144	79	93	44
D7-N-MeFOSE (surr.)	1	%	125	63	72	35
D9-N-EtFOSE (surr.)	1	%	133	61	73	33
D5-N-EtFOSAA (surr.)	1	%	123	59	67	37
D3-N-MeFOSAA (surr.)	1	%	117	58	75	37
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)						
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
13C2-4:2 FTSA (surr.)	1	%	143	77	80	54
13C2-6:2 FTSA (surr.)	1	%	161	71	85	52
13C2-8:2 FTSA (surr.)	1	%	148	53	87	46
13C2-10:2 FTSA (surr.)	1	%	123	58	75	35
Perfluoroalkyl sulfonic acids (PFSAs)						
Perfluorobutanesulfonic acid (PFBS)[N11]	0.01	ug/L	0.03	< 0.01	< 0.01	< 0.01
Perfluorononanesulfonic acid (PFNS)*[N15]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluoropropanesulfonic acid (PFPrS)*[N15]	0.01	ug/L	0.01	< 0.01	< 0.01	< 0.01
Perfluoropentanesulfonic acid (PFPeS)[N15]	0.01	ug/L	0.06	< 0.01	< 0.01	< 0.01
Perfluorohexanesulfonic acid (PFHxS)[N11]	0.01	ug/L	0.78	< 0.01	< 0.01	< 0.01
Perfluoroheptanesulfonic acid (PFHpS)[N15]	0.01	ug/L	0.05	< 0.01	< 0.01	< 0.01
Perfluorooctanesulfonic acid (PFOS)[N11]	0.01	ug/L	1.0	0.02	< 0.01	0.03
Perfluorodecanesulfonic acid (PFDS)[N15]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
13C3-PFBS (surr.)	1	%	158	79	71	47
18O2-PFHxS (surr.)	1	%	144	73	79	51
13C8-PFOS (surr.)	1	%	126	66	83	45
PFASs Summations						
Sum (PFHxS + PFOS)*	0.01	ug/L	1.78	0.02	< 0.01	0.03
Sum of PFASs (n=30)*	0.1	ug/L	2.06	< 0.1	< 0.1	0.11
Sum of US EPA PFAS (PFOS + PFOA)*	0.01	ug/L	1.05	0.02	< 0.01	0.03
Sum of enHealth PFAS (PFHxS + PFOS + PFOA)*	0.01	ug/L	1.83	0.02	< 0.01	0.03
Sum of WA DWER PFAS (n=10)*	0.05	ug/L	1.94	0.09	< 0.05	0.11

Client Sample ID			0089_QC205_240311	0089_QC207_240311	0089_QC209_240311	0089_QC211_240312
Sample Matrix			**Water**	**Water**	**Water**	**Water**
Eurofins Sample No.			**L24-Ma0038992**	**L24-Ma0038994**	**L24-Ma0038996**	**L24-Ma0038998**
Date Sampled			**Mar 11, 2024**	**Mar 11, 2024**	**Mar 11, 2024**	**Mar 12, 2024**
Test/Reference	LOR	Unit				
Perfluoroalkyl carboxylic acids (PFCAs)						
Perfluorobutanoic acid (PFBA)[N11]	0.05	ug/L	< 0.05	< 0.05	0.09	< 0.05
Perfluoropentanoic acid (PFPeA)[N11]	0.01	ug/L	< 0.01	< 0.01	0.27	0.02
Perfluorohexanoic acid (PFHxA)[N11]	0.01	ug/L	< 0.01	< 0.01	1.5	0.03
Perfluoroheptanoic acid (PFHpA)[N11]	0.05	ug/L	< 0.05	< 0.05	0.27	< 0.05
Perfluorooctanoic acid (PFOA)[N11]	0.01	ug/L	< 0.01	< 0.01	1.0	< 0.01
Perfluorononanoic acid (PFNA)[N11]	0.01	ug/L	< 0.01	< 0.01	0.01	< 0.01
Perfluorodecanoic acid (PFDA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluoroundecanoic acid (PFUnDA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorododecanoic acid (PFDoDA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorotridecanoic acid (PFTrDA)[N15]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorotetradecanoic acid (PFTeDA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
13C4-PFBA (surr.)	1	%	96	16	87	80
13C5-PFPeA (surr.)	1	%	177	59	168	151
13C5-PFHxA (surr.)	1	%	175	66		156
13C4-PFHpA (surr.)	1	%	174	68	174	152
13C8-PFOA (surr.)	1	%	166	56		160
13C5-PFNA (surr.)	1	%	168	63	168	153
13C6-PFDA (surr.)	1	%	144	58	108	127
13C2-PFUnDA (surr.)	1	%	127	50	143	114
13C2-PFDoDA (surr.)	1	%	122	50	156	103
13C2-PFTeDA (surr.)	1	%	48	23	103	50
Perfluoroalkyl sulfonamido substances						
Perfluorooctane sulfonamide (FOSA)[N11]	0.05	ug/L	< 0.05	< 0.05	0.13	< 0.05
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
13C8-FOSA (surr.)	1	%	148	59	163	129
D3-N-MeFOSA (surr.)	1	%	136	65	171	127
D5-N-EtFOSA (surr.)	1	%	153	76	INT	146
D7-N-MeFOSE (surr.)	1	%	128	56	165	119
D9-N-EtFOSE (surr.)	1	%	130	61	174	125
D5-N-EtFOSAA (surr.)	1	%	129	55	147	112
D3-N-MeFOSAA (surr.)	1	%	129	55	144	113
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)						
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)[N11]	0.05	ug/L	< 0.05	< 0.05	0.13	< 0.05
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)[N11]	0.01	ug/L	< 0.01	< 0.01	0.02	< 0.01
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
13C2-4:2 FTSA (surr.)	1	%	170	63	152	143

Client Sample ID			0089_QC205_240311	0089_QC207_240311	0089_QC209_240311	0089_QC211_240312
Sample Matrix			Water	Water	Water	Water
Eurofins Sample No.			L24-Ma0038992	L24-Ma0038994	L24-Ma0038996	L24-Ma0038998
Date Sampled			Mar 11, 2024	Mar 11, 2024	Mar 11, 2024	Mar 12, 2024
Test/Reference	LOR	Unit				
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)						
13C2-6:2 FTSA (surr.)	1	%	161	65	170	159
13C2-8:2 FTSA (surr.)	1	%	144	61	130	115
13C2-10:2 FTSA (surr.)	1	%	126	54	155	112
Perfluoroalkyl sulfonic acids (PFSAs)						
Perfluorobutanesulfonic acid (PFBS)[N11]	0.01	ug/L	< 0.01	< 0.01	0.27	< 0.01
Perfluorononanesulfonic acid (PFNS)*[N15]	0.01	ug/L	< 0.01	< 0.01	0.05	< 0.01
Perfluoropropanesulfonic acid (PFPrS)*[N15]	0.01	ug/L	< 0.01	< 0.01	0.06	< 0.01
Perfluoropentanesulfonic acid (PFPeS)[N15]	0.01	ug/L	< 0.01	< 0.01	0.93	< 0.01
Perfluorohexanesulfonic acid (PFHxS)[N11]	0.01	ug/L	< 0.01	< 0.01	15	0.03
Perfluoroheptanesulfonic acid (PFHpS)[N15]	0.01	ug/L	< 0.01	< 0.01	0.90	< 0.01
Perfluorooctanesulfonic acid (PFOS)[N11]	0.01	ug/L	< 0.01	< 0.01	19	0.09
Perfluorodecanesulfonic acid (PFDS)[N15]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
13C3-PFBS (surr.)	1	%	167	55	164	140
18O2-PFHxS (surr.)	1	%	174	61		145
13C8-PFOS (surr.)	1	%	148	63		127
PFASs Summations						
Sum (PFHxS + PFOS)*	0.01	ug/L	< 0.01	< 0.01	34	0.12
Sum of PFASs (n=30)*	0.1	ug/L	< 0.1	< 0.1	39.63	0.17
Sum of US EPA PFAS (PFOS + PFOA)*	0.01	ug/L	< 0.01	< 0.01	20	0.09
Sum of enHealth PFAS (PFHxS + PFOS + PFOA)*	0.01	ug/L	< 0.01	< 0.01	35	0.12
Sum of WA DWER PFAS (n=10)*	0.05	ug/L	< 0.05	< 0.05	37.55	0.17

Client Sample ID			0089_QC212_240312	0089_QC213_240312	0089_QC214_240312	0089_QC216_240312
Sample Matrix			Water	Water	Water	Water
Eurofins Sample No.			L24-Ma0038999	L24-Ma0039000	L24-Ma0039001	L24-Ma0039003
Date Sampled			Mar 12, 2024	Mar 12, 2024	Mar 12, 2024	Mar 12, 2024
Test/Reference	LOR	Unit				
Perfluoroalkyl carboxylic acids (PFCAs)						
Perfluorobutanoic acid (PFBA)[N11]	0.05	ug/L	< 0.05	1.1	< 0.05	< 0.05
Perfluoropentanoic acid (PFPeA)[N11]	0.01	ug/L	0.03	5.0	0.04	< 0.01
Perfluorohexanoic acid (PFHxA)[N11]	0.01	ug/L	0.04	5.5	0.08	< 0.01
Perfluoroheptanoic acid (PFHpA)[N11]	0.05	ug/L	< 0.05	1.4	< 0.05	< 0.05
Perfluorooctanoic acid (PFOA)[N11]	0.01	ug/L	< 0.01	0.51	< 0.01	< 0.01
Perfluorononanoic acid (PFNA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorodecanoic acid (PFDA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluoroundecanoic acid (PFUnDA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorododecanoic acid (PFDoDA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorotridecanoic acid (PFTrDA)[N15]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorotetradecanoic acid (PFTeDA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
13C4-PFBA (surr.)	1	%	31		14	67
13C5-PFPeA (surr.)	1	%	75		38	121
13C5-PFHxA (surr.)	1	%	84		34	125
13C4-PFHpA (surr.)	1	%	86		37	128
13C8-PFOA (surr.)	1	%	85	INT	35	127
13C5-PFNA (surr.)	1	%	88	INT	38	124
13C6-PFDA (surr.)	1	%	81	INT	35	103

Client Sample ID			0089_QC212_240312	0089_QC213_240312	0089_QC214_240312	0089_QC216_240312
Sample Matrix			Water	Water	Water	Water
Eurofins Sample No.			L24-Ma0038999	L24-Ma0039000	L24-Ma0039001	L24-Ma0039003
Date Sampled			Mar 12, 2024	Mar 12, 2024	Mar 12, 2024	Mar 12, 2024
Test/Reference	LOR	Unit				
Perfluoroalkyl carboxylic acids (PFCAs)						
13C2-PFUnDA (surr.)	1	%	70	195	30	92
13C2-PFDoDA (surr.)	1	%	64	181	30	90
13C2-PFTeDA (surr.)	1	%	25	95	13	41
Perfluoroalkyl sulfonamido substances						
Perfluorooctane sulfonamide (FOSA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
13C8-FOSA (surr.)	1	%	79	INT	37	108
D3-N-MeFOSA (surr.)	1	%	75	198	35	111
D5-N-EtFOSA (surr.)	1	%	81	INT	40	127
D7-N-MeFOSE (surr.)	1	%	67	176	36	105
D9-N-EtFOSE (surr.)	1	%	67	183	35	107
D5-N-EtFOSAA (surr.)	1	%	71	185	29	100
D3-N-MeFOSAA (surr.)	1	%	72	192	30	96
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)						
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)[N11]	0.05	ug/L	< 0.05	0.91	< 0.05	< 0.05
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
13C2-4:2 FTSA (surr.)	1	%	80	INT	39	112
13C2-6:2 FTSA (surr.)	1	%	88	INT	39	125
13C2-8:2 FTSA (surr.)	1	%	77	200	37	96
13C2-10:2 FTSA (surr.)	1	%	69	199	30	96
Perfluoroalkyl sulfonic acids (PFSAs)						
Perfluorobutanesulfonic acid (PFBS)[N11]	0.01	ug/L	< 0.01	0.38	< 0.01	< 0.01
Perfluorononanesulfonic acid (PFNS)*[N15]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluoropropanesulfonic acid (PFPrS)*[N15]	0.01	ug/L	< 0.01	0.10	< 0.01	< 0.01
Perfluoropentanesulfonic acid (PFPeS)[N15]	0.01	ug/L	< 0.01	0.46	< 0.01	< 0.01
Perfluorohexanesulfonic acid (PFHxS)[N11]	0.01	ug/L	0.05	1.1	0.02	0.22
Perfluoroheptanesulfonic acid (PFHpS)[N15]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorooctanesulfonic acid (PFOS)[N11]	0.01	ug/L	0.46	< 0.01	0.01	< 0.01
Perfluorodecanesulfonic acid (PFDS)[N15]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
13C3-PFBS (surr.)	1	%	75	INT	40	124
18O2-PFHxS (surr.)	1	%	83	INT	39	114
13C8-PFOS (surr.)	1	%	79	INT	37	113

Client Sample ID			0089_QC212_240312	0089_QC213_240312	0089_QC214_240312	0089_QC216_240312
Sample Matrix			Water	Water	Water	Water
Eurofins Sample No.			L24-Ma0038999	L24-Ma0039000	L24-Ma0039001	L24-Ma0039003
Date Sampled			Mar 12, 2024	Mar 12, 2024	Mar 12, 2024	Mar 12, 2024
Test/Reference	LOR	Unit				
PFASs Summations						
Sum (PFHxS + PFOS)*	0.01	ug/L	0.51	1.1	0.03	0.22
Sum of PFASs (n=30)*	0.1	ug/L	0.58	16.46	0.15	0.22
Sum of US EPA PFAS (PFOS + PFOA)*	0.01	ug/L	0.46	0.51	0.01	< 0.01
Sum of enHealth PFAS (PFHxS + PFOS + PFOA)*	0.01	ug/L	0.51	1.61	0.03	0.22
Sum of WA DWER PFAS (n=10)*	0.05	ug/L	0.58	15.9	0.15	0.22

Client Sample ID			0089_QC217_240312	0089_QC218_240312
Sample Matrix			Water	Water
Eurofins Sample No.			L24-Ma0039004	L24-Ma0039005
Date Sampled			Mar 12, 2024	Mar 12, 2024
Test/Reference	LOR	Unit		
Perfluoroalkyl carboxylic acids (PFCAs)				
Perfluorobutanoic acid (PFBA)[N11]	0.05	ug/L	< 0.05	< 0.05
Perfluoropentanoic acid (PFPeA)[N11]	0.01	ug/L	< 0.01	< 0.01
Perfluorohexanoic acid (PFHxA)[N11]	0.01	ug/L	< 0.01	< 0.01
Perfluoroheptanoic acid (PFHpA)[N11]	0.05	ug/L	< 0.05	< 0.05
Perfluorooctanoic acid (PFOA)[N11]	0.01	ug/L	< 0.01	< 0.01
Perfluorononanoic acid (PFNA)[N11]	0.01	ug/L	< 0.01	< 0.01
Perfluorodecanoic acid (PFDA)[N11]	0.01	ug/L	< 0.01	< 0.01
Perfluoroundecanoic acid (PFUnDA)[N11]	0.01	ug/L	< 0.01	< 0.01
Perfluorododecanoic acid (PFDoDA)[N11]	0.01	ug/L	< 0.01	< 0.01
Perfluorotridecanoic acid (PFTrDA)[N15]	0.01	ug/L	< 0.01	< 0.01
Perfluorotetradecanoic acid (PFTeDA)[N11]	0.01	ug/L	< 0.01	< 0.01
13C4-PFBA (surr.)	1	%	63	43
13C5-PFPeA (surr.)	1	%	115	96
13C5-PFHxA (surr.)	1	%	111	97
13C4-PFHpA (surr.)	1	%	116	90
13C8-PFOA (surr.)	1	%	124	98
13C5-PFNA (surr.)	1	%	121	93
13C6-PFDA (surr.)	1	%	107	83
13C2-PFUnDA (surr.)	1	%	93	72
13C2-PFDoDA (surr.)	1	%	93	74
13C2-PFTeDA (surr.)	1	%	55	47
Perfluoroalkyl sulfonamido substances				
Perfluorooctane sulfonamide (FOSA)[N11]	0.05	ug/L	< 0.05	< 0.05
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)[N11]	0.05	ug/L	< 0.05	< 0.05
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)[N11]	0.05	ug/L	< 0.05	< 0.05
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)[N11]	0.05	ug/L	< 0.05	< 0.05
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)[N11]	0.05	ug/L	< 0.05	< 0.05
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)[N11]	0.05	ug/L	< 0.05	< 0.05
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)[N11]	0.05	ug/L	< 0.05	< 0.05
13C8-FOSA (surr.)	1	%	107	83

Client Sample ID			0089_QC217_240312	0089_QC218_240312
Sample Matrix			Water	Water
Eurofins Sample No.			L24-Ma0039004	L24-Ma0039005
Date Sampled			Mar 12, 2024	Mar 12, 2024
Test/Reference	LOR	Unit		
Perfluoroalkyl sulfonamido substances				
D3-N-MeFOSA (surr.)	1	%	111	79
D5-N-EtFOSA (surr.)	1	%	126	92
D7-N-MeFOSE (surr.)	1	%	103	80
D9-N-EtFOSE (surr.)	1	%	110	83
D5-N-EtFOSAA (surr.)	1	%	92	77
D3-N-MeFOSAA (surr.)	1	%	91	73
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)				
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)[N11]	0.01	ug/L	< 0.01	< 0.01
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)[N11]	0.05	ug/L	< 0.05	< 0.05
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)[N11]	0.01	ug/L	< 0.01	< 0.01
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)[N11]	0.01	ug/L	< 0.01	< 0.01
13C2-4:2 FTSA (surr.)	1	%	113	92
13C2-6:2 FTSA (surr.)	1	%	118	89
13C2-8:2 FTSA (surr.)	1	%	89	79
13C2-10:2 FTSA (surr.)	1	%	94	75
Perfluoroalkyl sulfonic acids (PFSAs)				
Perfluorobutanesulfonic acid (PFBS)[N11]	0.01	ug/L	< 0.01	< 0.01
Perfluorononanesulfonic acid (PFNS)*[N15]	0.01	ug/L	< 0.01	< 0.01
Perfluoropropanesulfonic acid (PFPrS)*[N15]	0.01	ug/L	< 0.01	< 0.01
Perfluoropentanesulfonic acid (PFPeS)[N15]	0.01	ug/L	< 0.01	< 0.01
Perfluorohexanesulfonic acid (PFHxS)[N11]	0.01	ug/L	< 0.01	< 0.01
Perfluoroheptanesulfonic acid (PFHpS)[N15]	0.01	ug/L	< 0.01	< 0.01
Perfluorooctanesulfonic acid (PFOS)[N11]	0.01	ug/L	< 0.01	< 0.01
Perfluorodecanesulfonic acid (PFDS)[N15]	0.01	ug/L	< 0.01	< 0.01
13C3-PFBS (surr.)	1	%	106	84
18O2-PFHxS (surr.)	1	%	114	82
13C8-PFOS (surr.)	1	%	110	81
PFASs Summations				
Sum (PFHxS + PFOS)*	0.01	ug/L	< 0.01	< 0.01
Sum of PFASs (n=30)*	0.1	ug/L	< 0.1	< 0.1
Sum of US EPA PFAS (PFOS + PFOA)*	0.01	ug/L	< 0.01	< 0.01
Sum of enHealth PFAS (PFHxS + PFOS + PFOA)*	0.01	ug/L	< 0.01	< 0.01
Sum of WA DWER PFAS (n=10)*	0.05	ug/L	< 0.05	< 0.05

Sample History

Where samples are submitted/analysed over several days, the last date of extraction is reported.

If the date and time of sampling are not provided, the Laboratory will not be responsible for compromised results should testing be performed outside the recommended holding time.

Description	Testing Site	Extracted	Holding Time
Perfluoroalkyl carboxylic acids (PFCAs)	Welshpool	Mar 22, 2024	28 Days
- Method: Method ARL0510_ARL0511 PFAS in aqueous & solid samples by LC-MS/MS			
Perfluoroalkyl sulfonamido substances	Welshpool	Mar 22, 2024	28 Days
- Method: Method ARL0510_ARL0511 PFAS in aqueous & solid samples by LC-MS/MS			
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)	Welshpool	Mar 22, 2024	28 Days
- Method: Method ARL0510_ARL0511 PFAS in aqueous & solid samples by LC-MS/MS			
Perfluoroalkyl sulfonic acids (PFSAs)	Welshpool	Mar 22, 2024	28 Days
- Method: Method ARL0510_ARL0511 PFAS in aqueous & solid samples by LC-MS/MS			
PFASs Summations	Welshpool	Mar 22, 2024	
- Method: Method ARL0510_ARL0511 PFAS in aqueous & solid samples by LC-MS/MS			

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Project Name:
Project ID: WA_0089_PFASOMP_24

Order No.: 304700525/730
Report #: 1078840
Phone: [redacted]
Fax:

Received: Mar 13, 2024 11:27 AM
Due: Mar 20, 2024
Priority: 5 Day
Contact Name: [redacted]

Eurofins Analytical Services Manager : [redacted]

Sample Detail						Moisture Set	Per- and Polyfluoroalkyl Substances (PFASs)	Per- and Polyfluoroalkyl Substances (PFASs)
Perth Laboratory - NATA # 2377 Site # 2370						X	X	X
Melbourne Laboratory - NATA # 1261 Site # 1254							X	X
External Laboratory								
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**			
1	0089_QC201_240311	Mar 11, 2024		Water	L24-Ma0038988		X	
2	0089_QC202_240311	Mar 11, 2024		Water	L24-Ma0038989		X	
3	0089_QC203_240311	Mar 11, 2024		Water	L24-Ma0038990		X	
4	0089_QC204_240311	Mar 11, 2024		Water	L24-Ma0038991		X	
5	0089_QC205_240311	Mar 11, 2024		Water	L24-Ma0038992		X	
6	0089_QC206_240311	Mar 11, 2024		Soil	L24-Ma0038993	X		X
7	0089_QC207_240311	Mar 11, 2024		Water	L24-Ma0038994		X	

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Project Name:
Project ID: WA_0089_PFASOMP_24

Order No.: 304700525/730
Report #: 1078840
Phone: [redacted]
Fax:

Received: Mar 13, 2024 11:27 AM
Due: Mar 20, 2024
Priority: 5 Day
Contact Name: [redacted]

Eurofins Analytical Services Manager : [redacted]

Sample Detail						Moisture Set	Per- and Polyfluoroalkyl Substances (PFASs)	Per- and Polyfluoroalkyl Substances (PFASs)
Perth Laboratory - NATA # 2377 Site # 2370						X	X	X
Melbourne Laboratory - NATA # 1261 Site # 1254							X	X
External Laboratory								
8	0089_QC208_240311	Mar 11, 2024		Soil	L24-Ma0038995	X		X
9	0089_QC209_240311	Mar 11, 2024		Water	L24-Ma0038996		X	
10	0089_QC210_240312	Mar 12, 2024		Soil	L24-Ma0038997	X		X
11	0089_QC211_240312	Mar 12, 2024		Water	L24-Ma0038998		X	
12	0089_QC212_240312	Mar 12, 2024		Water	L24-Ma0038999		X	
13	0089_QC213_240312	Mar 12, 2024		Water	L24-Ma0039000		X	
14	0089_QC214_240312	Mar 12, 2024		Water	L24-Ma0039001		X	
15	0089_QC215_240312	Mar 12, 2024		Soil	L24-Ma0039002	X		X

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Company Name: Stantec Australia Pty Ltd (WA)
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Project Name:
Project ID: WA_0089_PFASOMP_24

Order No.: 304700525/730
Report #: 1078840
Phone: [redacted]
Fax:

Received: Mar 13, 2024 11:27 AM
Due: Mar 20, 2024
Priority: 5 Day
Contact Name: [redacted]

Eurofins Analytical Services Manager : [redacted]

Sample Detail						Moisture Set	Per- and Polyfluoroalkyl Substances (PFASs)	Per- and Polyfluoroalkyl Substances (PFASs)
Perth Laboratory - NATA # 2377 Site # 2370						X	X	X
Melbourne Laboratory - NATA # 1261 Site # 1254							X	X
External Laboratory								
16	0089_QC216_240312	Mar 12, 2024		Water	L24-Ma0039003		X	
17	0089_QC217_240312	Mar 12, 2024		Water	L24-Ma0039004		X	
18	0089_QC218_240312	Mar 12, 2024		Water	L24-Ma0039005		X	
Test Counts						4	14	4

Internal Quality Control Review and Glossary

General

1. Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples follow guidelines delineated in the National Environment Protection (Assessment of Site Contamination) Measure 1999, as amended May 2013. They are included in this QC report where applicable. Additional QC data may be available on request.
2. Unless otherwise stated, all soil/sediment/solid results are reported on a dry weight basis.
3. Unless otherwise stated, all biota/food results are reported on a wet weight basis on the edible portion.
4. For CEC results where the sample's origin is unknown or environmentally contaminated, the results should be used advisedly.
5. Actual LORs are matrix dependent. Quoted LORs may be raised where sample extracts are diluted due to interferences.
6. Results are uncorrected for matrix spikes or surrogate recoveries except for PFAS compounds where annotated.
7. SVOC analysis on waters is performed on homogenised, unfiltered samples unless noted otherwise.
8. Samples were analysed on an 'as received' basis.
9. Information identified in this report with **blue** colour indicates data provided by customers that may have an impact on the results.
10. This report replaces any interim results previously issued.

Holding Times

Please refer to the 'Sample Preservation and Container Guide' for holding times (QS3001).

For samples received on the last day of holding time, notification of testing requirements should have been received at least 6 hours before sample receipt deadlines as stated on the SRA.

If the Laboratory did not receive the information in the required timeframe, and despite any other integrity issues, suitably qualified results may still be reported.

Holding times apply from the sampling date; therefore, compliance with these may be outside the laboratory's control.

For VOCs containing vinyl chloride, styrene and 2-chloroethyl vinyl ether, the holding time is seven days; however, for all other VOCs, such as BTEX or C6-10 TRH, the holding time is 14 days.

Units

mg/kg: milligrams per kilogram	**mg/L:** milligrams per litre	**ppm:** parts per million
µg/L: micrograms per litre	**ppb:** parts per billion	**%:** Percentage
org/100 mL: Organisms per 100 millilitres	**NTU:** Nephelometric Turbidity Units	**MPN/100 mL:** Most Probable Number of organisms per 100 millilitres
CFU: Colony Forming Unit	**Colour:** Pt-Co Units (CU)	

Terms

APHA	American Public Health Association
CEC	Cation Exchange Capacity
COC	Chain of Custody
CP	Client Parent - QC was performed on samples pertaining to this report
CRM	Certified Reference Material (ISO17034) - reported as percent recovery.
Dry	Where moisture has been determined on a solid sample, the result is expressed on a dry weight basis.
Duplicate	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
LOR	Limit of Reporting.
LCS	Laboratory Control Sample - reported as percent recovery.
Method Blank	In the case of solid samples, these are performed on laboratory-certified clean sands and in the case of water samples, these are performed on de-ionised water.
NCP	Non-Client Parent - QC performed on samples not pertaining to this report, QC represents the sequence or batch that client samples were analysed within.
RPD	Relative Percent Difference between two Duplicate pieces of analysis.
SPIKE	Addition of the analyte to the sample and reported as percentage recovery.
SRA	Sample Receipt Advice
Surr - Surrogate	The addition of a similar compound to the analyte target is reported as percentage recovery. See below for acceptance criteria.
TBTO	Tributyltin oxide (*bis*-tributyltin oxide) - individual tributyltin compounds cannot be identified separately in the environment; however, free tributyltin was measured, and its values were converted stoichiometrically into tributyltin oxide for comparison with regulatory limits.
TCLP	Toxicity Characteristic Leaching Procedure
TEQ	Toxic Equivalency Quotient or Total Equivalence
QSM	US Department of Defense Quality Systems Manual Version 6.0
US EPA	United States Environmental Protection Agency
WA DWER	Sum of PFBA, PFPeA, PFHxA, PFHpA, PFOA, PFBS, PFHxS, PFOS, 6:2 FTSA, 8:2 FTSA

QC - Acceptance Criteria

The acceptance criteria should only be used as a guide and may be different when site-specific Sampling Analysis and Quality Plan (SAQP) have been implemented.

RPD Duplicates: Global RPD Duplicates Acceptance Criteria is ≤30%; however, the following acceptance guidelines are equally applicable:

Results <10 times the LOR:	No Limit
Results between 10-20 times the LOR:	RPD must lie between 0-50%
Results >20 times the LOR:	RPD must lie between 0-30%

NOTE: pH duplicates are reported as a range, not as RPD

Surrogate Recoveries: Recoveries must lie between 20-130% for Speciated Phenols & 50-150% for PFAS. SVOCs recoveries 20 – 150%, VOC recoveries 50 – 150%

PFAS field samples containing surrogate recoveries above the QC limit designated in QSM 6.0, where no positive PFAS results have been reported or reviewed, and no data was affected.

QC Data General Comments

1. Where a result is reported as less than (<), higher than the nominated LOR, this is due to either matrix interference, extract dilution required due to interferences or contaminant levels within the sample, high moisture content or insufficient sample provided.
2. Duplicate data shown within this report that states the word "BATCH" is a Batch Duplicate from outside of your sample batch but within the laboratory sample batch at a 1:10 ratio. The Parent and Duplicate data shown are not data from your samples.
3. pH and Free Chlorine analysed in the laboratory - Analysis on this test must begin within 30 minutes of sampling. Therefore, laboratory analysis is unlikely to be completed within holding time.Analysis will begin as soon as possible after sample receipt.
4. Recovery Data (Spikes & Surrogates) - where chromatographic interference does not allow the determination of recovery, the term "INT" appears against that analyte.
5. For Matrix Spikes and LCS results, a dash "-" in the report means that the specific analyte was not added to the QC sample.
6. Duplicate RPDs are calculated from raw analytical data; thus, it is possible to have two sets of data.

Quality Control Results

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Method Blank							
Perfluoroalkyl carboxylic acids (PFCAs)							
Perfluorobutanoic acid (PFBA)	ug/L	< 0.05			0.05	Pass	
Perfluoropentanoic acid (PFPeA)	ug/L	< 0.01			0.01	Pass	
Perfluorohexanoic acid (PFHxA)	ug/L	< 0.01			0.01	Pass	
Perfluoroheptanoic acid (PFHpA)	ug/L	< 0.05			0.05	Pass	
Perfluorooctanoic acid (PFOA)	ug/L	< 0.01			0.01	Pass	
Perfluorononanoic acid (PFNA)	ug/L	< 0.01			0.01	Pass	
Perfluorodecanoic acid (PFDA)	ug/L	< 0.01			0.01	Pass	
Perfluoroundecanoic acid (PFUnDA)	ug/L	< 0.01			0.01	Pass	
Perfluorododecanoic acid (PFDoDA)	ug/L	< 0.01			0.01	Pass	
Perfluorotridecanoic acid (PFTrDA)	ug/L	< 0.01			0.01	Pass	
Perfluorotetradecanoic acid (PFTeDA)	ug/L	< 0.01			0.01	Pass	
Method Blank							
Perfluoroalkyl sulfonamido substances							
Perfluorooctane sulfonamide (FOSA)	ug/L	< 0.05			0.05	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	ug/L	< 0.05			0.05	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	ug/L	< 0.05			0.05	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)	ug/L	< 0.05			0.05	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)	ug/L	< 0.05			0.05	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	ug/L	< 0.05			0.05	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	ug/L	< 0.05			0.05	Pass	
Method Blank							
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)							
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	ug/L	< 0.01			0.01	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)	ug/L	< 0.05			0.05	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	ug/L	< 0.01			0.01	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	ug/L	< 0.01			0.01	Pass	
Method Blank							
Perfluoroalkyl sulfonic acids (PFSAs)							
Perfluorobutanesulfonic acid (PFBS)	ug/L	< 0.01			0.01	Pass	
Perfluorononanesulfonic acid (PFNS)*	ug/L	< 0.01			0.01	Pass	
Perfluoropropanesulfonic acid (PFPrS)*	ug/L	< 0.01			0.01	Pass	
Perfluoropentanesulfonic acid (PFPeS)	ug/L	< 0.01			0.01	Pass	
Perfluorohexanesulfonic acid (PFHxS)	ug/L	< 0.01			0.01	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	ug/L	< 0.01			0.01	Pass	
Perfluorooctanesulfonic acid (PFOS)	ug/L	< 0.01			0.01	Pass	
Perfluorodecanesulfonic acid (PFDS)	ug/L	< 0.01			0.01	Pass	
Method Blank							
Perfluoroalkyl carboxylic acids (PFCAs)							
Perfluorobutanoic acid (PFBA)	ug/L	< 0.05			0.05	Pass	
Perfluoropentanoic acid (PFPeA)	ug/L	< 0.01			0.01	Pass	
Perfluorohexanoic acid (PFHxA)	ug/L	< 0.01			0.01	Pass	
Perfluoroheptanoic acid (PFHpA)	ug/L	< 0.05			0.05	Pass	
Perfluorooctanoic acid (PFOA)	ug/L	< 0.01			0.01	Pass	
Perfluorononanoic acid (PFNA)	ug/L	< 0.01			0.01	Pass	
Perfluorodecanoic acid (PFDA)	ug/L	< 0.01			0.01	Pass	
Perfluoroundecanoic acid (PFUnDA)	ug/L	< 0.01			0.01	Pass	
Perfluorododecanoic acid (PFDoDA)	ug/L	< 0.01			0.01	Pass	
Perfluorotridecanoic acid (PFTrDA)	ug/L	< 0.01			0.01	Pass	
Perfluorotetradecanoic acid (PFTeDA)	ug/L	< 0.01			0.01	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Method Blank							
Perfluoroalkyl sulfonamido substances							
Perfluorooctane sulfonamide (FOSA)	ug/L	< 0.05			0.05	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	ug/L	< 0.05			0.05	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	ug/L	< 0.05			0.05	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)	ug/L	< 0.05			0.05	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)	ug/L	< 0.05			0.05	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	ug/L	< 0.05			0.05	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	ug/L	< 0.05			0.05	Pass	
Method Blank							
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)							
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	ug/L	< 0.01			0.01	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)	ug/L	< 0.05			0.05	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	ug/L	< 0.01			0.01	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	ug/L	< 0.01			0.01	Pass	
Method Blank							
Perfluoroalkyl sulfonic acids (PFSAs)							
Perfluorobutanesulfonic acid (PFBS)	ug/L	< 0.01			0.01	Pass	
Perfluorononanesulfonic acid (PFNS)*	ug/L	< 0.01			0.01	Pass	
Perfluoropropanesulfonic acid (PFPrS)*	ug/L	< 0.01			0.01	Pass	
Perfluoropentanesulfonic acid (PFPeS)	ug/L	< 0.01			0.01	Pass	
Perfluorohexanesulfonic acid (PFHxS)	ug/L	< 0.01			0.01	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	ug/L	< 0.01			0.01	Pass	
Perfluorooctanesulfonic acid (PFOS)	ug/L	< 0.01			0.01	Pass	
Perfluorodecanesulfonic acid (PFDS)	ug/L	< 0.01			0.01	Pass	
LCS - % Recovery							
Perfluoroalkyl carboxylic acids (PFCAs)							
Perfluorobutanoic acid (PFBA)	%	90			50-150	Pass	
Perfluoropentanoic acid (PFPeA)	%	112			50-150	Pass	
Perfluorohexanoic acid (PFHxA)	%	119			50-150	Pass	
Perfluoroheptanoic acid (PFHpA)	%	81			50-150	Pass	
Perfluorooctanoic acid (PFOA)	%	68			50-150	Pass	
Perfluorononanoic acid (PFNA)	%	58			50-150	Pass	
Perfluorodecanoic acid (PFDA)	%	57			50-150	Pass	
Perfluoroundecanoic acid (PFUnDA)	%	62			50-150	Pass	
Perfluorododecanoic acid (PFDoDA)	%	74			50-150	Pass	
Perfluorotridecanoic acid (PFTrDA)	%	77			50-150	Pass	
Perfluorotetradecanoic acid (PFTeDA)	%	73			50-150	Pass	
LCS - % Recovery							
Perfluoroalkyl sulfonamido substances							
Perfluorooctane sulfonamide (FOSA)	%	69			50-150	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	%	61			50-150	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	%	68			50-150	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)	%	72			50-150	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)	%	69			50-150	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	%	65			50-150	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	%	75			50-150	Pass	
LCS - % Recovery							
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)							
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	%	82			50-150	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)	%	129			50-150	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	%	75			50-150	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	%	58			50-150	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
LCS - % Recovery							
Perfluoroalkyl sulfonic acids (PFSAs)							
Perfluorobutanesulfonic acid (PFBS)	%	85			50-150	Pass	
Perfluorononanesulfonic acid (PFNS)*	%	54			50-150	Pass	
Perfluoropropanesulfonic acid (PFPrS)*	%	75			50-150	Pass	
Perfluoropentanesulfonic acid (PFPeS)	%	76			50-150	Pass	
Perfluorohexanesulfonic acid (PFHxS)	%	74			50-150	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	%	77			50-150	Pass	
Perfluorooctanesulfonic acid (PFOS)	%	75			50-150	Pass	
Perfluorodecanesulfonic acid (PFDS)	%	69			50-150	Pass	
LCS - % Recovery							
Perfluoroalkyl carboxylic acids (PFCAs)							
Perfluorobutanoic acid (PFBA)	%	64			50-150	Pass	
Perfluoropentanoic acid (PFPeA)	%	64			50-150	Pass	
Perfluorohexanoic acid (PFHxA)	%	76			50-150	Pass	
Perfluoroheptanoic acid (PFHpA)	%	80			50-150	Pass	
Perfluorooctanoic acid (PFOA)	%	72			50-150	Pass	
Perfluorononanoic acid (PFNA)	%	56			50-150	Pass	
Perfluorodecanoic acid (PFDA)	%	60			50-150	Pass	
Perfluoroundecanoic acid (PFUnDA)	%	64			50-150	Pass	
Perfluorododecanoic acid (PFDoDA)	%	68			50-150	Pass	
Perfluorotridecanoic acid (PFTrDA)	%	72			50-150	Pass	
Perfluorotetradecanoic acid (PFTeDA)	%	68			50-150	Pass	
LCS - % Recovery							
Perfluoroalkyl sulfonamido substances							
Perfluorooctane sulfonamide (FOSA)	%	72			50-150	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	%	60			50-150	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	%	64			50-150	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)	%	72			50-150	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)	%	68			50-150	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	%	76			50-150	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	%	76			50-150	Pass	
LCS - % Recovery							
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)							
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	%	96			50-150	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)	%	64			50-150	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	%	64			50-150	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	%	52			50-150	Pass	
LCS - % Recovery							
Perfluoroalkyl sulfonic acids (PFSAs)							
Perfluorobutanesulfonic acid (PFBS)	%	56			50-150	Pass	
Perfluorononanesulfonic acid (PFNS)*	%	52			50-150	Pass	
Perfluoropropanesulfonic acid (PFPrS)*	%	56			50-150	Pass	
Perfluoropentanesulfonic acid (PFPeS)	%	64			50-150	Pass	
Perfluorohexanesulfonic acid (PFHxS)	%	64			50-150	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	%	68			50-150	Pass	
Perfluorooctanesulfonic acid (PFOS)	%	68			50-150	Pass	
Perfluorodecanesulfonic acid (PFDS)	%	64			50-150	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Spike - % Recovery									
Perfluoroalkyl carboxylic acids (PFCAs)				Result 1					
Perfluorobutanoic acid (PFBA)	L24-Ma0038989	CP	%	94			50-150	Pass	
Perfluoropentanoic acid (PFPeA)	L24-Ma0038989	CP	%	59			50-150	Pass	
Perfluorohexanoic acid (PFHxA)	L24-Ma0038989	CP	%	71			50-150	Pass	
Perfluoroheptanoic acid (PFHpA)	L24-Ma0038989	CP	%	69			50-150	Pass	
Perfluorooctanoic acid (PFOA)	L24-Ma0038989	CP	%	67			50-150	Pass	
Perfluorononanoic acid (PFNA)	L24-Ma0038989	CP	%	62			50-150	Pass	
Perfluorodecanoic acid (PFDA)	L24-Ma0038989	CP	%	64			50-150	Pass	
Perfluoroundecanoic acid (PFUnDA)	L24-Ma0038989	CP	%	68			50-150	Pass	
Perfluorododecanoic acid (PFDoDA)	L24-Ma0038989	CP	%	78			50-150	Pass	
Perfluorotridecanoic acid (PFTrDA)	L24-Ma0038989	CP	%	118			50-150	Pass	
Perfluorotetradecanoic acid (PFTeDA)	L24-Ma0038989	CP	%	70			50-150	Pass	
Spike - % Recovery									
Perfluoroalkyl sulfonamido substances				Result 1					
Perfluorooctane sulfonamide (FOSA)	L24-Ma0038989	CP	%	70			50-150	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	L24-Ma0038989	CP	%	68			50-150	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	L24-Ma0038989	CP	%	73			50-150	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)	L24-Ma0038989	CP	%	69			50-150	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)	L24-Ma0038989	CP	%	68			50-150	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	L24-Ma0038989	CP	%	74			50-150	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	L24-Ma0038989	CP	%	67			50-150	Pass	
Spike - % Recovery									
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)				Result 1					
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	L24-Ma0038989	CP	%	91			50-150	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)	L24-Ma0038989	CP	%	71			50-150	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	L24-Ma0038989	CP	%	64			50-150	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	L24-Ma0038989	CP	%	71			50-150	Pass	
Spike - % Recovery									
Perfluoroalkyl sulfonic acids (PFSAs)				Result 1					
Perfluorobutanesulfonic acid (PFBS)	L24-Ma0038989	CP	%	64			50-150	Pass	
Perfluorononanesulfonic acid (PFNS)*	L24-Ma0038989	CP	%	54			50-150	Pass	
Perfluoropropanesulfonic acid (PFPrS)*	L24-Ma0038989	CP	%	71			50-150	Pass	
Perfluoropentanesulfonic acid (PFPeS)	L24-Ma0038989	CP	%	72			50-150	Pass	
Perfluorohexanesulfonic acid (PFHxS)	L24-Ma0038989	CP	%	80			50-150	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	L24-Ma0038989	CP	%	86			50-150	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Perfluorooctanesulfonic acid (PFOS)	L24-Ma0038989	CP	%	83			50-150	Pass	
Perfluorodecanesulfonic acid (PFDS)	L24-Ma0038989	CP	%	58			50-150	Pass	

Comments

Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	Yes
Sample correctly preserved	Yes
Appropriate sample containers have been used	Yes
Sample containers for volatile analysis received with minimal headspace	Yes
Samples received within HoldingTime	Yes
Some samples have been subcontracted	No

Qualifier Codes/Comments

Code	Description
N11	Isotope dilution is used for calibration of each native compound for which an exact labelled analogue is available (Isotope Dilution Quantitation). The isotopically labelled analogues allow identification and recovery correction of the concentration of the associated native PFAS compounds.
N15	Where the native PFAS compound does not have labelled analogue then the quantification is made using the Extracted Internal Standard Analyte with the closest retention time to the analyte and no recovery correction has been made (Internal Standard Quantitation).

Authorised by:

[redacted] Analytical Services Manager
[redacted] Senior Analyst-PFAS

[redacted]
[redacted]
General Manager

- Indicates Not Requested

* Indicates NATA accreditation does not cover the performance of this service

Measurement uncertainty of test data is available on request

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APPENDIX

D

FIELD RECORDS & CALIBRATION CERTIFICATES

Cardno

now

Stantec

Monitoring Date	Monitoring Location	Sample ID	Screen Interval (mBGL)	TOC (mAHD)	Well Depth (m)	HydraSleeve intake (+/- 0.5m)	SWL (mbTOC)	RWL (mAHD)	Other Observations on Bore/Site	Purge Method	R1 - Temp (Co)	R1 - DO (mg/L)
11/03/2024	MW109	0089_MW109_240311	2.5-5.5_	4.446	5.5	4.0	4.24	0.206		HydraSleeve	21	1.23
11/03/2024	MW112	0089_MW112_240311	3.0 - 6.0	3.973	6.0	5.0	3.6	0.373		HydraSleeve	20.7	1.63
11/03/2024	MW120	0089_MW120_240311	2.5-5.5_	4.409	5.5	4.5	4.17	0.239		HydraSleeve	20.9	2.05
11/03/2024	MW121	0089_MW121_240311	2.7-5.7_	3.7	5.7	4.5	3.45	0.25		HydraSleeve	21.5	4.33
11/03/2024	MW123	0089_MW123_240311	4.5-8_	6.62	8.0	6.0	4.42	2.2	RWL outlier, not used for groundwater contours	HydraSleeve	21.4	2.72
11/03/2024	MW124	0089_MW124_240311	0.75-4_	1.899	4.0	2.5	1.94	-0.041		HydraSleeve	20.3	0.48
11/03/2024	MW125	0089_MW125_240311	0.9-3.9_	1.882	3.9	2.5	1.9	-0.018		HydraSleeve	21.5	1.23
11/03/2024	MW126	0089_MW126_240311	0.9-3.9_	1.948	3.9	2.5	1.92	0.028		HydraSleeve	23	0.44
11/03/2024	MW127	0089_MW127_240311	0.9-3.9_	1.771	3.9	2.5	1.77	0.001		HydraSleeve	20.8	0.28
12/03/2024	MW128	0089_MW128_240312	2.5-5.5	4.537	5.5	4.5	4.04	0.497		HydraSleeve	21.9	3.08
11/03/2024	MW139	0089_MW139_240311	2-5_	2.273	5.0	4.0	2.185	0.088		HydraSleeve	26.8	1.19
11/03/2024	MW141	0089_MW141_240311	2-5_	3.025	5.0	4.0	2.985	0.04		HydraSleeve	22.8	0.57
11/03/2024	MW142	0089_MW142_240311	0.25-4_	2.573	4.0	2.5	2.56	0.013		HydraSleeve	22.4	0.75
11/03/2024	MW147	0089_MW147_240311	2-5_	3.423	4.31		3.36	0.063	Well shallower than borelog. Likely sand ingress	HandBailing	21	1.09
11/03/2024	MW149	0089_MW149_240311	1-4_	2.303	4.0	3.5	2.285	0.018		HydraSleeve	22.7	0.82
12/03/2024	MW158	0089_MW158_240312	NA	14.541	15.82	5.0	14.62	-0.079		HydraSleeve	21.4	1.38
12/03/2024	MW161	0089_MW161_240312	NA	17.225	18.13	4.5	16.865	0.36		HydraSleeve	22.7	1.71
12/03/2024	MW166	0089_MW166_240312	10-13_	11.89	12.22		11.37	0.52	Sand ingress. Bailer used for shallow water (purged fi	HandBailing	21	1.37
12/03/2024	MW171	0089_MW171_240312	28.5-31.5_	29.238	31.5	30.0	28.655	0.583		HydraSleeve	21.3	0.75
13/03/2024	MW173	0089_MW173_240313	NA	10.08	11.11	9.5	9.75	0.33		HydraSleeve	23.6	2.92
12/03/2024	MW193	0089_MW193_240312	10.5-13.5	11.86	13.5	12.0	11.37	0.49		HydraSleeve	22.6	2.26
12/03/2024	MW195D	0089_MW195D_240312	10-13	4.363	13	12.0	4.3	0.063		HydraSleeve	21.9	1.81
12/03/2024	MW195S	0089_MW195S_240312	3.5-6.5	4.571	6.5	5.5	4.27	0.301		HydraSleeve	22.5	3.8
12/03/2024	MW196	0089_MW196_240312	NA	12.75	13.8	11.0	12.61	0.14		HydraSleeve	22.5	4.05
12/03/2024	MW197		NA	2.28	NA				sand ingress, no water			
12/03/2024	MW199	0089_MW199_240312	NA	11.8	NA	7.0	11.68	0.12		HydraSleeve	22.5	0.79
13/03/2024	MW200	0089_MW200_240313	NA	2.07	NA	5.0	2.08	-0.01		HydraSleeve	23.3	1.78
12/03/2024	MW202	0089_MW202_240312	NA	2.12	NA	6.0	1.93	0.19		HydraSleeve	21.6	1.85
13/03/2024	MW203	0089_MW203_240313	NA	10.855	12.9	11.0	10.67	0.185		HydraSleeve	23.2	2.45
11/03/2024	MW214	0089_MW214_240311	5.5-9	8.075	9	8.0	7.83	0.245		HydraSleeve	21.2	0.94
11/03/2024	MW215	0089_MW215_240311	1.5-4.5	3.794	4.5	2.5	3.64	0.154		HydraSleeve	22	1.98
12/03/2024	MW216	0089_MW216_240312	6-9_	8.329	9	7.5	8.03	0.299		HydraSleeve	21.4	1.25
13/03/2024	MW217	0089_MW217_240313	6.5-9.5_	8.847	9.5	7.5	8.54	0.307		HydraSleeve	20.9	5
13/03/2024	MW220	0089_MW220_240313	NA	NA	NA	8.0	6.8			HydraSleeve	20.4	1.01
13/03/2024	MW224	0089_MW224_240313	11.25-14.25_	13.372	14.25	13.0	13.1	0.272		HydraSleeve	20.6	3.92
12/03/2024	MW225	0089_MW225_240312	2-5_	4.066	5.0	3.5	3.915	0.151		HydraSleeve	21.9	0.86
12/03/2024	MW226	0089_MW226_240312	0.75-3.8_	1.749	3.8	2.5	1.745	0.004		HydraSleeve	22.5	0.74
12/03/2024	MW227	0089_MW227_240312	1.25-4.2_	2.961	4.2	3.0	2.96	0.001		HydraSleeve	21.8	1.32
12/03/2024	MW228	0089_MW228_240312	0.75-3.75_	2.23	3.75	2.5	2.25	-0.02		HydraSleeve	21.6	1.38
12/03/2024	MW233	0089_MW233_240312	NA	3.705	4.968	3.5	3.45	0.255		HydraSleeve	19.1	3.77
12/03/2024	MW236	0089_MW236_240312	NA	4.642	5.66	4.5	4.24	0.402		HydraSleeve	19.6	2.97
12/03/2024	MW238	0089_MW238_240312	NA	4.827	NA	3.5	4.59	0.237		HydraSleeve	20	2.76
12/03/2024	MW239	0089_MW239_240312	NA	4.03	NA	4.0	3.82	0.21		HydraSleeve	20.3	2.88
12/03/2024	MW240	0089_MW240_240312	NA	4.483	6.8	4.0	4.25	0.233		HydraSleeve	20.3	1.71
12/03/2024	MW242	0089_MW242_240312	NA	3.539	4.76	3.5	3.36	0.179		HydraSleeve	23.2	1.97
12/03/2024	MW243	0089_MW243_240312	NA	4.892	7.0	5.5	4.67	0.222		HydraSleeve	19.6	3.57
12/03/2024	MW245	0089_MW245_240312	NA	4.551	5.65	4.5	4.36	0.191		HydraSleeve	19.9	2.97
13/03/2024	MW249	0089_MW249_240313	3.5-6.5_	5.227	6.5	4.5	5.12	0.107		HydraSleeve	22.9	0.64
12/03/2024	MW255	0089_MW255_240312	3-6_	4.609	6.0	5.0	4.24	0.369		HydraSleeve	19.9	2.64
12/03/2024	MW256	0089_MW256_240312	3-6_	3.84	6.0	5.0	3.43	0.41		HydraSleeve	19.3	2.38
11/03/2024	MW257	0089_MW257_240311	2.7-5.7_	3.806	5.7	5.0	3.51	0.296		HydraSleeve	24	3.55
11/03/2024	MW258	0089_MW258_240311	3-6_	4.043	4.965	5.0	3.765	0.278	Bore shallower than original depth (tree roots)	HydraSleeve	24.1	1.38
11/03/2024	MW259	0089_MW259_240311	2.5-5.5_	3.8	5.5	4.0	3.535	0.265		HydraSleeve	22	1.71
12/03/2024	MW268	0089_MW268_240312	2.5-5.5_	4.056	5.5	4.0	3.8	0.256		HydraSleeve	19.8	2.07
12/03/2024	MW269	0089_MW269_240312	2.5-5.5_	4.153	5.5	4.0	3.98	0.173		HydraSleeve	19.3	2.38
13/03/2024	MW282	0089_MW282_240313	4.5-7.5_	5.78	7.5	6.0	5.43	0.35		HydraSleeve	21.5	3.15
12/03/2024	MW288	0089_MW288_240312	2.25-5.25_	4.003	5.25	3.5	3.83	0.173		HydraSleeve	20.9	2.8
11/03/2024	MW289	0089_MW289_240311	3.25-6.25_	4.495	6.25	4.0	4.26	0.235		HydraSleeve	21.1	0.99
13/03/2024	MW496	0089_MW496_240313	3.5-8_	5.092	8.0	6.0	4.98	0.112		HydraSleeve	23.8	2.08
11/03/2024	MW500	0089_MW500_240311	2-6.5_	3.692	6.5	5.0	3.47	0.222		HydraSleeve	20.5	1.6
13/03/2024	MW516	0089_MW516_240313	4.5-7.5_	6.37	7.5	6.0	6.27	0.1		HydraSleeve	23.3	0.68

R1 - EC (us/Cm)	R1 - TDS (mg/L)	R1 - pH	R1 - Eh (mV)	R2 - T (°C)	R2 - DO (mg/L)	R2 - EC (us/Cm)	R2 - TDS (mg/L)	R2 - pH	R2 - Eh (mV)	R3 - T (°C)	R3 - DO (mg/L)	R3 - EC (us/Cm)	R3 - TDS (mg/L)	R3 - pH	R3 - Eh (mV)	QC Dup #	Odour	Colour
1488	968.5	7.33	14.8															Cloudy
594	383.5	7.54	-40.3															Cloudy
736	481	7.68	-23.2															Cloudy
815	533	7.93	-18.9															Cloudy
1989	1293.5	7.85	-24.1													QC109/209		Clear
47090	30634.5	7.05	-191.4															Clear
50440	32786	7.21	-278.5															Clear
39948	25974	7.01	-294.5														Hydrogen sulfide	Cloudy
45540	29601	7.01	-303.5														Hydrogen sulfide	Cloudy
1871	1223	7.02	21.8															Clear
12868	8372	7.31	-200.1													QC105, QC205		Cloudy,Brown
28304	18408	6.92	-198.9															Clear
33538	21814	7	-85															Clear
27220	17693	7.02	-247.1	20.7	1.45	27132	17634	7.04	-239.2	20.7	1.37	27137	17641	7.04	-239.7		Stagnant smell	Clear
23802	15470	7.21	-182.9														Slight saline smell	Clear
14111	9171.5	7.21	33.3															Clear
3124	2028	7.44	40.5															Clear
4911	3191.5	7.22	30	21	1.33	4911	3191.5	7.22	29.8	21	1.31	4912	3191.5	7.22	29.6			Clear
12765	8300.5	7.36	-238.3														Stagnant smell	Clear
2623	1703	7.18	30.7															Clear
5286	3419	7.53	18.7															Cloudy
26663	7329	7.45	10															Clear
3730	2424.5	7.17	24.3															Clear
662	429	7.65	34.5															Cloudy,Brown
19385	2603.5	7.14	-230.8														Hydrocarbons	Clear
6276	4082	7.38	31															Clear
1327	864.5	7.41	33.7															Clear
1198	780	7.39	31.1															Clear
6420	4173	7.12	19.6															Clear
1657	1079	7.42	24.7														Stagnant	Clear
2804	1820	7.24	32															Clear,Cloudy
729	474.5	7.4	56.9															Cloudy
692	448.5	7.39	48.7														Hydrogen sulfide	Cloudy
450.3	292.5	7.48	62.1															Cloudy
3543	2301	7.15	24.1													QC118, QC218		Clear,Cloudy
44044	28626	7.11	33.1															Cloudy,Green
2832	1839.5	7.21	29.2															Clear
10689	6948.5	7.26	65.3													QC113, QC213		Cloudy,Green
303.2	196.95	7.48	-123.3															Clear
722	468	7.37	8.8															Brown
772	500.5	7.49	56.1															Clear
702	455	7.54	73.1															Clear
868	565.5	7.35	47.1													QC116/216	Slight fuel odour	Clear
464.5	301.6	7.57	-17.2													QC117/217		Clear
825	533	7.5	51.4														Slight fuel odour	Brown
888	578.5	7.01	-118.1														Fuel odour	Brown
1398	910	7.25	21.4															Cloudy
1146	747.5	7.73	-27.1															Cloudy
4189	2723.5	7.22	-20.3															Clear
1923	1248	10.9																Clear,Cloudy
1546	1007.5	7.08	16.9															Cloudy,Black
638	416	7.61	20.5															Cloudy,Clear
5480	3562	7.24	13.2															Clear
1819	1183	7.5	-54.1															Clear
1200	780	7.04	63.3															Clear
876	572	7.12	-10.8															Clear
1178	767	7.23	142.3													QC101/201		Brown
1364	884	7.42	-259.7														Slight fuel odour	Clear
970	630.5	7.3	19															Cloudy
1046	682.5	7.18	-54.9														Slight fuel odour	Clear

Monitoring Date	Monitoring Location	Sample ID	Sample Depth	Purge Method	R1 - T (°C)	R1 - DO (mg/L)	R1 - EC (us/Cm)	R1 - TDS (mg/L)	R1 - pH	R1 - Eh (mV)	R2 - T (°C)	R2 - DO (mg/L)	R2 - EC (us/Cm)	R2 - TDS (mgL)	R2 - pH	R2 - Eh (mV)	R3 - T (°C)	R3 - DO (mg/L)	R3 - EC (us/Cm)	R3 - TDS (mg/L)	R3 - pH	R3 - Eh (mV)	QC Dup #	Odour	Colour
12/03/2024	PW304	0089_PW304_240312	0.8	Peristalstic Pump	25.1	0.27	58660	8092	7.34	-43.9	25.1	0.26	58660	8095	7.34	-43.7	25.1	0.26	58657	8095	7.34	-45.9	QC111/211		Clear
11/03/2024	PW306	0089_PW306_240311	0.8	Peristalstic Pump	22.5	2.72	55730		7.74	31.4	22.5	2.67	55730		7.74	31.6	22.5	2.64	55727		7.74	33.2			Clear
11/03/2024	PW307	0089_PW307_240311	0.6	Peristalstic Pump	23	6.07	55338		8.06	31.4	23	5.95	55338		8.06	31.6	23	5.89	55335		8.06	33.2			Clear
11/03/2024	PW308	0089_PW308_240311	0.8	Peristalstic Pump	23.8	6.2	55432		8.01	28.6	23.8	6.08	55432		8.01	28.8	23.8	6.02	55429		8.01	30.2			Clear
11/03/2024	PW314	0089_PW314_240311	0.8	Peristalstic Pump	24	5.4	55377		8.01	30.6	24	5.29	55377		8.01	30.8	24	5.24	55374		8.01	32.3			Clear
11/03/2024	PW315	0089_PW315_240311	0.8	Peristalstic Pump	23.4	3.9	55559		7.91	31.5	23.4	3.82	55559		7.91	31.7	23.4	3.78	55556		7.91	33.3	QC103/203		Clear
11/03/2024	PW316	0089_PW316_240311	0.8	Peristalstic Pump	23.4	5.85	52179		8.05	30.8	23.4	5.73	52179		8.05	31	23.4	5.68	52176		8.05	32.6			Clear
11/03/2024	PW329	0089_PW329_240311	0.3	Peristalstic Pump	24.5	0.96	56464	36725	7.75	-115.3	24.5	0.94	56464	36725	7.75	-115.1	24.5	0.93	56461	36725	7.75	-120.9			Clear
11/03/2024	PW330	0089_PW330_240311	0.3	Peristalstic Pump	22.1	1.48	56570	36790	7.61	-103.2	22.1	1.45	56570	36790	7.61	-103	22.1	1.44	56567	36790	7.61	-108.2			Clear
11/03/2024	PW331	0089_PW331_240311	0.3	Peristalstic Pump	24.5	0.74	57415	37310	7.71	-129	24.5	0.73	57415	37310	7.71	-128.8	24.5	0.72	57412	37310	7.71	-135.2		Slightly saline	Clear
11/03/2024	PW335	0089_PW335_240311	0.8	Peristalstic Pump	20.7	0.13	64752	42120	7.41	-257.9	20.7	0.11	64757	42120	7.42	-258	20.7	0.1	64770	42120	7.42	-258.7	QC104/204		Clear
11/03/2024	PW340	0089_PW340_240311	0.8	Peristalstic Pump	22.4	1.16	64347	41795	7.53	9.3	22.4	1.15	64351	41795	7.53	9.7	22.4	1.16	64338	41795	7.53	10.2			Clear
11/03/2024	PW341	0089_PW341_240311	0.6	Peristalstic Pump	26.1	0.94	59680	38455	7.77	-143.2	26.2	0.95	59831	38585	7.76	-138.6	26.2	0.95	59968	38650	7.76	-137.5			Clear
13/03/2024	PW345	0089_PW345_240313	0.8	Peristalstic Pump	23.3	0.39	55023	5750	6.98	1.5	23.3	0.39	55023	5750	6.98	1.5	23.3	4.73	55023	5750	6.98	1.5		Seaweed	Clear
12/03/2024	PW346	0089_PW346_240312	0.8	Peristalstic Pump	20.7	0.79	51449	33455	7.15	-213.6	20.8	0.75	51510	33481.5	7.16	-213.3	20.8	0.73	51515	33488	7.16	-212.9			Clear
11/03/2024	PW350	0089_PW350_240311	0.8	Peristalstic Pump	20.9	5.31	55116		7.14	77.1	20.9	4.78	55116		7.14	77.3	20.9	4.73	55120		7.14	77.3			Clear
11/03/2024	PW351	0089_PW351_240311	0.8	Peristalstic Pump	22.4	5.56	54949		8.06	31.5	22.4	5.00	54949		8.06	31.7	22.4	4.95	54953		8.06	31.7			Clear
11/03/2024	PW352	0089_PW352_240311	0.6	Peristalstic Pump	22	4.8	54305		7.99	38.2	22	4.32	54305		7.99	38.4	22	4.28	54309		7.99	38.4			Clear
11/03/2024	PW356	0089_PW356_240311	0.4	Peristalstic Pump	22.6	0.6	56450	36725	7.66	-174.2	22.6	0.54	56450	36726	7.66	-174	22.6	0.53	56454	36726	7.66	-174			Clear
11/03/2024	PW357	0089_PW357_240311	0.4	Peristalstic Pump	25.4	0.55	56625	36790	7.7	-225.5	25.4	0.50	56625	36791	7.7	-225.3	25.4	0.49	56629	36791	7.7	-225.3		Saline smell	Cloudy,Black
11/03/2024	PW358	0089_PW358_240311	0.5	Peristalstic Pump	23.9	1.08	56798	36920	7.76	-135.2	23.9	0.97	56798	36921	7.76	-135	23.9	0.96	56802	36921	7.76	-135		Saline smell	Clear
11/03/2024	PW362	0089_PW362_240311	0.6	Peristalstic Pump	24.4	3.41	61356	39910	7.98	-61.6	24.4	3.38	61365	39911	7.98	-60.3	24.4	3.33	61366	39910	7.98	-58.8			Clear
11/03/2024	PW363	0089_PW363_240311	0.7	Peristalstic Pump	23.3	2.8	61882	40235	7.89	-175.9	23.4	2.55	61969	40300	7.89	-173.2	23.5	2.39	62119	40365	7.89	-169.2			Clear
11/03/2024	PW364	0089_PW364_240311	0.8	Peristalstic Pump	22.7	1.31	65196	42380	7.5	-32.5	22.7	1.39	65187	42380	7.5	-30.7	22.7	1.26	65187	42380	7.5	-29.6			Clear
13/03/2024	PW367	0089_PW367_240313	0.7	Peristalstic Pump	23	3.88	53694	4905	7.69	22.9	23	3.76	53694	4905	7.69	24.0	23	3.73	53695	4905	7.69	24.0		Seaweed	Clear
12/03/2024	PW368	0089_PW368_240312	0.5	Peristalstic Pump	23.3	0.34	60884	9585.5	7.34	-125.2	23.3	0.33	60884	9585.5	7.34	-131.5	23.3	0.33	60885	9585.5	7.34	-131.5			Clear
13/03/2024	PW369	0089_PW369_240313	0.8	Peristalstic Pump	23	2.57	53701	4905	7.1	26.2	23	2.49	53701	4905	7.1	27.5	23	2.47	53702	4905	7.1	27.5		Seaweed	Clear
11/03/2024	PW374	0089_PW374_240311	0.6	Peristalstic Pump	25.1	3.99	55357	6010	7.82	29	25.1	3.87	55357	6010	7.82	30.5	25.1	3.83	55358	6010	7.82	30.6			Clear
11/03/2024	PW375	0089_PW375_240311	0.8	Peristalstic Pump	24.1	3.77	55537	6075	7.92	28.3	24.1	3.66	55537	6075	7.92	29.7	24.1	3.62	55538	6075	7.92	29.7			Clear
11/03/2024	PW378	0089_PW378_240311	0.8	Peristalstic Pump	24	4.11	56272	6595	7.86	28.2	24	3.99	56272	6595	7.86	29.6	24	3.95	56273	6595	7.86	29.7			Clear
11/03/2024	PW380	0089_PW380_240311	0.6	Peristalstic Pump	20.7	6.01	54912		8.05	30.8	20.7	5.83	54912		8.05	32.3	20.7	5.77	54913		8.05	32.3			Clear
11/03/2024	PW381	0089_PW381_240311	0.7	Peristalstic Pump	22	4.99	55233		8.06	34.6	22	4.84	55233		8.06	36.3	22	4.79	55234		8.06	36.2			Clear
11/03/2024	PW401	0089_PW401_240311	0.6	Peristalstic Pump	21.4	5.18	55092		7.46	57.4	21.4	5.02	55092		7.46	60.3	21.4	4.97	55093		7.46	60.1			Clear
12/03/2024	PW405	0089_PW405_240312	0.4	Peristalstic Pump	22.8	3.04	54461	35425	7.52	51	22.8	2.95	54461	35424	7.52	53.6	22.8	2.92	54462	35424	7.52	53.6	QC114, QC214		Clear
12/03/2024	PW407	0089_PW407_240312	0.4	Peristalstic Pump	23.1	3.3	41297	26858	7.56	48.1	23.1	3.20	41297	26857	7.56	50.5	23.1	3.17	41298	26857	7.56	50.4			Clear
12/03/2024	PW409	0089_PW409_240312	0.2	Peristalstic Pump	22.5	2.06	56515	36725	7.58	41.3	22.5	2.00	56515	36724	7.58	43.4	22.5	1.98	56516	36724	7.58	43.4			Clear
12/03/2024	PW411	0089_PW411_240312	0.8	Peristalstic Pump	23.2	3.7	56340	36660	7.29	47.4	23.2	3.59	56340	36659	7.29	49.8	23.2	3.55	56341	36659	7.29	49.9			Cloudy,Black
12/03/2024	PW413	0089_PW413_240312	0.6	Peristalstic Pump	22.6	4.99	55973	36400	7.53	46.6	22.6	4.84	55973	36399	7.53	48.9	22.6	4.79	55974	36399	7.53	48.9			Cloudy,Brown
12/03/2024	PW415	0089_PW415_240312	1.1	Peristalstic Pump	23.2	4.43	56076	36465	7.61	48.4	23.2	4.30	56076	36464	7.61	50.8	23.2	4.25	56077	36464	7.61	50.8			Clear

Monitoring Location	Date	Sample ID	Sampling Method	Sample Depth (m)	WaterBody Depth (m)	Temp (°C)	DO (mg/L)	EC (us/Cm)	TDS (mg/L)	pH	Eh (mV)	Colour	QC Dup #
SW130	11/03/2024	0089_SW130_240311	Direct into Bottle	0.1	0.8	22.8	1.96	62033	40300	7.65	21.8	Clear	
SW132	11/03/2024	0089_SW132_240311	Direct into Bottle	0.1	0.8	24.3	2.65	61813	40170	7.65	4.3	Brown to clear	
SW134	11/03/2024	0089_SW134_240311	Direct into Bottle	0.1	1.0	25.6	1.8	60253	39195	7.79	-160	Clear	
SW150	11/03/2024	0089_SW150_240311	Direct into Bottle	0.1	0.5	25	4.08	55729	36205	8.15	-13.2	Clear	QC107, QC207
SW152	11/03/2024	0089_SW152_240311	Direct into Bottle	0.1	0.9	25.2	3.98	56308	36595	8.17	-14.8	Clear	
SW154	11/03/2024	0089_SW154_240311	Direct into Bottle	0.15	1	25.9	4.86	55700	36205	8.16	-30.5	Clear	
SW156	11/03/2024	0089_SW156_240311	Direct into Bottle	0.15	0.5	25.9	4.73	55986	36400	8.16	-20	Clear	
SW305	12/03/2024	0089_SW305_240312	Direct into Bottle	0.05	1.0	26.3	1.51	53965	5100	7.56	-11.1	Clear	QC112/212
SW309	11/03/2024	0089_SW309_240311	Direct into Bottle	0.2	1.0	23.7	1.64	56553		7.74	30.8	Clear	QC102/202
SW310	11/03/2024	0089_SW310_240311	Direct into Bottle	0.2	1.0	23.4	5.91	55370		8.05	31.4	Clear	
SW311	11/03/2024	0089_SW311_240311	Direct into Bottle	0.2	1.0	26.6	7.4	54998		7.99	29.5	Clear	
SW317	11/03/2024	0089_SW317_240311	Direct into Bottle	0.2	1.0	24.4	4.72	55520	6075	8.14	28.2	Clear	
SW318	11/03/2024	0089_SW318_240311	Direct into Bottle	0.2	1.0	23.1	5.1	55559	6205	8.12	28.2	Clear	
SW319	11/03/2024	0089_SW319_240311	Direct into Bottle	0.2	1.0	23.1	4.25	55738	6205	8.08	28.9	Clear	
SW353	11/03/2024	0089_SW353_240311	Direct into Bottle	0.2	1.0	22.3	4.08	54119		6.88	89.9	Clear	
SW370	13/03/2024	0089_SW370_240313	Direct into Bottle	0.05	1.0	23.1	1.04	55209	5880	7.57	17.9	Clear	
SW371	12/03/2024	0089_SW371_240312	Direct into Bottle	0.05	1.0	22.7	3.77	54401	5425	7.74	31.7	Clear	
SW372	12/03/2024	0089_SW372_240312	Direct into Bottle	0.1	0.6	22.1	3.51	60163	39130	7.92	-6.5	Brown	
SW373	12/03/2024	0089_SW373_240312	Direct into Bottle	0.1	0.5	22.3	3.82	60423	39260	7.89	69.6	Brown	
SW382	11/03/2024	0089_SW382_240311	Direct into Bottle	0.2	1.0	22.1	5.72	54968		8.07	34.6	Clear	
SW383	11/03/2024	0089_SW383_240311	Direct into Bottle	0.2	1.0	22.1	5.93	54954		8.07	36.8	Clear	
SW384	11/03/2024	0089_SW384_240311	Direct into Bottle	0.2	1.0	21.9	6.34	30872		7.71	48.1	Clear	
SW406	12/03/2024	0089_SW406_240312	Direct into Bottle	0.12	0.8	21.3	3.76	55176	35880	7.94	49.5	Clear	
SW408	12/03/2024	0089_SW408_240312	Direct into Bottle	0.15	0.5	21.7	5.19	54848	35385	7.93	54.8	Clear	
SW410	12/03/2024	0089_SW410_240312	Direct into Bottle	0.15	0.4	22.9	3.62	56163	36530	7.88	44.3	Clear	
SW412	12/03/2024	0089_SW412_240312	Direct into Bottle	0.15	1.1	23.7	4.11	56064	36465	8.11	40.6	Clear	
SW414	12/03/2024	0089_SW414_240312	Direct into Bottle	0.15	1.1	24.1	3.79	55993	36400	8.13	42	Clear	
SW416	12/03/2024	0089_SW416_240312	Direct into Bottle	0.15	1.3	23.6	3.91	55815	36270	8.06	46.1	Clear	

Monitoring Location	Date	Sample ID	Depth of Sediment Sampling (m)	Sampling Method	Sample Condition	Sample Description	Comments
SD304	12/03/2024	0089_SD304_240312	0.8	Trowel, Shovel	Wet	SAND: fine grained, rounded, white	QC110/210
SD306	11/03/2024	0089_SD306_240311	0.8	Trowel, Shovel	Wet	SAND: fine grained, yellow and white, rounded	
SD307	11/03/2024	0089_SD307_240311	0.6	Trowel, Shovel	Wet	SAND: fine grained, rounded, yellow and white	
SD308	11/03/2024	0089_SD308_240311	0.8	Trowel, Shovel	Wet	SAND:fine grained, rounded, yellow and white	
SD314	11/03/2024	0089_SD314_240311	0.8	Trowel, Shovel	Wet	SAND: fine grained, rounded, yellow and white	
SD315	11/03/2024	0089_SD315_240311	0.8	Trowel, Shovel	Wet	SAND: fine grained, yellow and white, rounded	QC106/206
SD316	11/03/2024	0089_SD316_240311	0.8	Trowel, Shovel	Wet	SAND: fine grained, rounded, yellow and white	
SD329	11/03/2024	0089_SD329_240311	0.3	Trowel, Shovel	Wet	SAND, fine to med grain, yellow and grey	
SD330	11/03/2024	0089_SD330_240311	0.3	Trowel, Shovel	Wet	SAND, fine to med grain, yellow and grey	
SD331	11/03/2024	0089_SD331_240311	0.3	Trowel, Shovel	Wet	SAND, fine to med grain, yellow and grey	
SD335	11/03/2024	0089_SD335_240311	0.8	Trowel, Shovel	Wet	Sand, fine to med grained, beige, trace seaweed	
SD340	11/03/2024	0089_SD340_240311	0.8	Trowel, Shovel	Wet	Sand, fine to med grained, beige, trace organics	
SD341	11/03/2024	0089_SD341_240311	0.6	Trowel, Shovel	Wet	Sand, fine to med grained, beige, trace organics	
SD345	13/03/2024	0089_SD345_240313	0.8	Trowel, Shovel	Wet	SAND:fine grained, rounded, yellow and white	
SD346	12/03/2024	0089_SD346_240312	0.8	Trowel, Shovel	Wet	Sand, fine to med grained, beige, trace shells, trace organics	
SD350	11/03/2024	0089_SD350_240311	0.8	Trowel, Shovel	Wet	SAND: fine grained, yellow and white	
SD351	11/03/2024	0089_SD351_240311	0.8	Trowel, Shovel	Wet	SAND: fine grained, rounded, yellow and white	
SD352	11/03/2024	0089_SD352_240311	0.6	Trowel, Shovel	Wet	SAND:fine grained, rounded, yellow and white	
SD356	11/03/2024	0089_SD356_240311	0.4	Trowel, Shovel	Wet	SAND, fine to med grain, yellow and grey	
SD357	11/03/2024	0089_SD357_240311	0.4	Trowel, Shovel	Wet	SAND, fine to med grain, yellow and grey	
SD358	11/03/2024	0089_SD358_240311	0.5	Trowel, Shovel	Wet	SAND, fine to med grain, yellow and grey	QC108/208
SD362	11/03/2024	0089_SD362_240311	0.6	Trowel, Shovel	Wet	Sand, fine to med grained, beige, trace organics	
SD363	11/03/2024	0089_SD363_240311	0.7	Trowel, Shovel	Wet	Sand, fine to med grained, beige, trace organics	
SD364	11/03/2024	0089_SD364_240311	0.8	Trowel, Shovel	Wet	Sand, fine to med grained, beige, seaweed	Noted lots of seaweed present on beach
SD367	13/03/2024	0089_SD367_240313	0.7	Trowel, Shovel	Wet	SAND: fine grained, rounded, yellow and white	
SD368	12/03/2024	0089_SD368_240312	0.5	Trowel, Shovel	Wet	SAND: fine grained, rounded, white	
SD369	13/03/2024	0089_SD369_240313	0.8	Trowel, Shovel	Wet	SAND: fine grained, rounded, yellow and white	
SD374	11/03/2024	0089_SD374_240311	0.6	Trowel, Shovel	Wet	SAND: course grained, rounded, yellow and white	
SD375	11/03/2024	0089_SD375_240311	0.8	Trowel, Shovel	Wet	SAND: course grained, rounded, yellow and white	
SD378	11/03/2024	0089_SD378_240311	0.8	Trowel, Shovel	Wet	SAND: course grained, rounded, yellow and white	
SD380	11/03/2024	0089_SD380_240311	0.6	Trowel, Shovel	Wet	SAND: fine grained, rounded, yellow and white	
SD381	11/03/2024	0089_SD381_240311	0.7	Trowel, Shovel	Wet	SAND:fine grained, rounded, yellow and white	
SD401	11/03/2024	0089_SD401_240311	0.6	Trowel, Shovel	Wet	SAND: fine grained, yellow and white, rounded	
SD405	12/03/2024	0089_SD405_240312	0.4	Trowel, Shovel	Wet	SAND, fine grained, white	QC115, QC215
SD407	12/03/2024	0089_SD407_240312	0.4	Trowel, Shovel	Wet	SAND, fine grained, white	
SD409	12/03/2024	0089_SD409_240312	0.2	Trowel, Shovel	Wet	SAND, fine grained, white	
SD411	12/03/2024	0089_SD411_240312	0.8	Trowel, Shovel	Wet	SAND, fine grained, grey/black	
SD413	12/03/2024	0089_SD413_240312	0.6	Trowel, Shovel	Wet	SAND, fine grained, white/grey	
SD415	12/03/2024	0089_SD415_240312	1.1	Trowel, Shovel	Wet	SAND, fine grained, white/grey	

GK Environmental EQUIPMENT

Calibration Report

Multi-Parameter Water Quality Instrument

Customer: [redacted]
Contact: [redacted]

Manufacturer: YSI
Instrument: Professional Plus with Quatro cable
Serial #: 20K104050
Cable length: 1m 20K100096

Item	Test	Pass	Comments
Battery	2 x Alkaline C-cells	✓	Voltage reading above 2.9V
	Battery Saver	✓	Automatically turns off after 30 minutes if not used
Connections	Condition	✓	Good, clean
Cable	Condition	✓	Clean, no tears
Display	Operation	✓	
Firmware	Version	✓	4.0.0
Keypad	Operational	✓	
Display	Screen	✓	
Unit	Condition, seals and O-rings	✓	
Monitor housing	Condition	✓	
pH			
Condition		✓	Good, clean
pH millivolts for pH7 calibration range 0 mV ± 50 mV		✓	
pH 4 mV range + 165 to + 180 from 7 buffer mV value		✓	173.30 mV
pH slope		✓	55 to 60 mV/pH, ideal 59mV 57.83
Response time < 90 seconds		✓	
Calibrated and conforms to manufacturer's specifications		✓	
ORP			
Condition		✓	Good, clean
Response time < 90 seconds		✓	
within ± 80mv of reference Zobell Reading		✓	
Calibrated and conforms to manufacturer's specifications		✓	variance range ± 20mV -2 mV
Conductivity			
Condition		✓	Good, clean
Temperature		✓	°C
Conductivity cell constant 5.0 ± 1.0 in GLP file		✓	
Clean sensor reads less than 3 uS/cm in dry air		✓	
Calibrated and conforms to manufacturer's specifications		✓	µs/cm
Dissolved Oxygen			
Condition		✓	Good, clean
DO sensor in use		✓	Galvanic
1.25 mil PE membrane (yellow membrane):		✓	
DO Sensor Value		✓	(min 4.31 uA - max 8.00 uA) Avg 6.15 uA
Calibrated and conforms to manufacturer's specifications		✓	ppm

This is to certify that the above instrument has been calibrated to the following specifications:

						Instrument Readings		
Parameter	**Standards**	**Reference**	**Calibration Point**	**Span**	**Units**	**Before**	**After**	**Units**
Temperature (17F100079)	Check Temp NATA	Room Temp	24.6	-0.2	°C	NA	24.4	°C
pH (22F)	pH 7.00	392512	7.01	-22.90	mV	7.08	7.01	pH
pH (22F)	pH 4.00	394799	4.00	150.40	mV	4.13	4.00	pH
Conductivity (17F100079)	2764 µs/cm at 25°C	23/2308	2764	GLP	5.04	2764	2764	µs/cm
ORP (2010055IA605102)	Zobell A & B	23/3006	230	230	mV	222.1	232.8	mV
Zero DO (20H100139)	NaSO3 in distilled water	10175	0.0	NA	NA	-0.1	0.0	%
100% DO (20H100139)	100% Air Saturation	Air	100.0	1.6	uA	103.9	100.0	%

Calibrated by: [redacted]

Calibration Date: 07-Mar-24
Next Due: 03-Sep-24

GK Environmental EQUIPMENT

Calibration Report

Multi-Parameter Water Quality Instrument

Customer:
Contact:

Manufacturer: YSI
Instrument: Professional Plus with Quatro cable
Serial #: 19L102400
Cable length: 1m 19H100045

Item	Test	Pass	Comments
Battery	2 x Alkaline C-cells	✓	Voltage reading above 2.9V
	Battery Saver	✓	Automatically turns off after 30 minutes if not used
Connections	Condition	✓	Good, clean
Cable	Condition	✓	Clean, no tears
Display	Operation	✓	
Firmware	Version	✓	4.0.0
Keypad	Operational	✓	
Display	Screen	✓	
Unit	Condition, seals and O-rings	✓	
Monitor housing	Condition	✓	
pH			
Condition		✓	Good, clean
pH millivolts for pH7 calibration range 0 mV ± 50 mV		✓	
pH 4 mV range + 165 to + 180 from 7 buffer mV value		✓	176.50 mV
pH slope		✓	55 to 60 mV/pH, ideal 59mV 59.04
Response time < 90 seconds		✓	
Calibrated and conforms to manufacturer's specifications		✓	
ORP			
Condition		✓	Good, clean
Response time < 90 seconds		✓	
within ± 80mv of reference Zobell Reading		✓	
Calibrated and conforms to manufacturer's specifications		✓	variance range ± 20mV -2 mV
Conductivity			
Condition		✓	Good, clean
Temperature		✓	°C
Conductivity cell constant 5.0 ± 1.0 in GLP file		✓	
Clean sensor reads less than 3 uS/cm in dry air		✓	
Calibrated and conforms to manufacturer's specifications		✓	µs/cm
Dissolved Oxygen			
Condition		✓	Good, clean
DO sensor in use		✓	Galvanic
1.25 mil PE membrane (yellow membrane):		✓	
DO Sensor Value		✓	(min 4.31 uA - max 8.00 uA) Avg 6.15 uA
Calibrated and conforms to manufacturer's specifications		✓	ppm

This is to certify that the above instrument has been calibrated to the following specifications:

						Instrument Readings		
Parameter	**Standards**	**Reference**	**Calibration Point**	**Span**	**Units**	**Before**	**After**	**Units**
Temperature (21A100491)	Check Temp NATA	Room Temp	23.6	-0.1	°C	NA	23.5	°C
pH (22F)	pH 7.00	392512	7.01	-24.70	mV	7.01	7.01	pH
pH (22F)	pH 4.00	394799	4.00	151.80	mV	4	4.00	pH
Conductivity (21A100491)	2764 µs/cm at 25°C	23/2308	2764	GLP	4.92	2825	2764	µs/cm
ORP (200124SEN605102)	Zobell A & B	23/3006	232	232	mV	232.4	233.9	mV
Zero DO (21K100090)	NaSO3 in distilled water	10175	0.0	NA	NA	-0.4	0.0	%
100% DO (21K100090)	100% Air Saturation	Air	100.0	6.59	%	111.8	100.0	%

Calibrated by: [redacted]

Calibration Date: 17-Feb-24
Next Due: 15-Aug-24

GK Environmental EQUIPMENT

Calibration Report

Multi-Parameter Water Quality Instrument

Customer:
Contact:

Manufacturer: YSI
Instrument: Professional Plus with Quatro cable
Serial #: 20B120527
Cable length: 1m (18K100836)

Item	Test	Pass	Comments
Battery	2 x Alkaline C-cells	✓	Voltage reading above 2.9V
	Battery Saver	✓	Automatically turns off after 30 minutes if not used
Connections	Condition	✓	Good, clean
Cable	Condition	✓	Clean, no tears
Display	Operation	✓	
Firmware	Version	✓	4.0.0
Keypad	Operational	✓	
Display	Screen	✓	
Unit	Condition, seals and O-rings	✓	
Monitor housing	Condition	✓	
pH			
Condition		✓	Good, clean
pH millivolts for pH7 calibration range 0 mV ± 50 mV		✓	
pH 4 mV range + 165 to + 180 from 7 buffer mV value		✓	174.10 mV
pH slope		✓	55 to 60 mV/pH, ideal 59mV 58.48
Response time < 90 seconds		✓	
Calibrated and conforms to manufacturer's specifications		✓	
ORP			
Condition		✓	Good, clean
Response time < 90 seconds		✓	
within ± 80mv of reference Zobell Reading		✓	
Calibrated and conforms to manufacturer's specifications		✓	variance range ± 20mV 5 mV
Conductivity			
Condition		✓	Good, clean
Temperature		✓	°C
Conductivity cell constant 5.0 ± 1.0 in GLP file		✓	
Clean sensor reads less than 3 uS/cm in dry air		✓	
Calibrated and conforms to manufacturer's specifications		✓	µs/cm
Dissolved Oxygen			
Condition		✓	Good, clean
DO sensor in use		✓	Galvanic
1.25 mil PE membrane (yellow membrane):		✓	
DO Sensor Value		✓	(min 4.31 uA - max 8.00 uA) Avg 6.15 uA
Calibrated and conforms to manufacturer's specifications		✓	ppm

This is to certify that the above instrument has been calibrated to the following specifications:

						Instrument Readings		
Parameter	**Standards**	**Reference**	**Calibration Point**	**Span**	**Units**	**Before**	**After**	**Units**
Temperature (18K100288)	Check Temp NATA	Room Temp	23.7	-2.6	°C	NA	21.1	°C
pH (22F)	pH 7.00	392512	7.01	-11.80	mV	7	7.01	pH
pH (22F)	pH 4.00	394799	4.00	162.30	mV	3.99	4.00	pH
Conductivity (18K100288)	2764 µs/cm at 25°C	23/2308	2764	GLP	5.15	2721	2764	µs/cm
ORP (200124SEN506102)	Zobell A & B	23/3006	238	238	mV	234.8	232.1	mV
Zero DO (20H100658)	NaSO3 in distilled water	10175	0.0	NA	NA	-0.1	0.0	%
100% DO (20H100658)	100% Air Saturation	Air	100.0	6.39	uA	120	100.0	%

Calibrated by: [redacted]

Calibration Date: 20-Feb-24
Next Due: 18-Aug-24

Date of Bump Test	Site ID	Unit Brand/ Model	Ambient Air Oxygen Calibration	Zero % Oxygen Solution Calibration	Standard Concentrations	Ambient Temperature (°C)	Bump Test Reading	Bump Test Readings within ±5%?	Comment	Test by (Name)	(Signature)
12/3/24	0089	YSI #20B120527	100% Saturation? (Y) N	0% Calibration? (Y) N NA	pH 4.00 (Y) / N pH 7.00 (Y) / N EC: 1,413µS/cm (Y) / N EC: 35,000	22	pH 4.00: 4.15 pH 7.00: 7.06 EC: 1421 EC: 35,941	pH 4.00: (± pH 0.2) (Y) / N pH 7.00: (± pH 0.2) (Y) / N EC: (± 150µS/cm) (Y) / N EC: (± 3500) (Y) / N	Pass	[redacted]	
12/3/24	0089	YSI #20L104050	100% Saturation? (Y) N	0% Calibration? (Y) N NA	pH 4.00 (Y) / N pH 7.00 (Y) / N EC: 1,413µS/cm (Y) / N EC: 35,000	22	pH 4.00: 4.09 pH 7.00: 7.03 EC: 1324 EC: 35,907	pH 4.00: (± pH 0.2) (Y) / N pH 7.00: (± pH 0.2) (Y) / N EC: (± 150µS/cm) (Y) / N EC (± 3500) (Y) / N	Pass		
12/3/24	0089	YSI #19L102400	100% Saturation? (Y) N	0% Calibration? (Y) N NA	pH 4.00 (Y) / N pH 7.00 (Y) / N EC: 1,413µS/cm (Y) / N EC: 35,000	22	pH 4.00: 4.09 pH 7.00: 7.14 EC: 1342 EC: 36,941	pH 4.00: (± pH 0.2) (Y) / N pH 7.00: (± pH 0.2) (Y) / N EC: (± 150µS/cm) (Y) N EC: (± 3500) (Y) / N	Pass		
13/3/24	0089	YSI # 20k1[illegible]	100% Saturation? (Y) N	0% Calibration? (Y) N NA	pH 4.00 (Y) / N pH 7.00 (Y) / N EC: 1,413µS/cm (Y) / N EC 35,000	22.1	pH 4.00: 4.08 pH 7.00: 7.06 Temp: EC: 1,504 31,691	pH 4.00: (± pH 0.2) (Y) / N pH 7.00: (± pH 0.2) (Y) / N EC: (± 150µS/cm) (Y) / N	Pass		
13/3/24	0089_	YSI # 19L102400	100% Saturation? Y N	0% Calibration? Y N NA	pH 4.00 (Y) / N pH 7.00 Y / N EC: 1,413µS/cm Y / N EC 35,000	22.1	pH 4.00: 4.10 pH 7.00: Temp: 7.03 EC: 1,501	pH 4.00: (± pH 0.2) (Y) / N pH 7.00: (± pH 0.2) (Y) / N EC: (± 150µS/cm) (Y) / N	Pass		
		YSI #	100% Saturation? Y N	0% Calibration? Y N NA	pH 4.00 Y / N pH 7.00 Y / N EC: 1,413µS/cm Y / N		pH 4.00: pH 7.00: Temp: EC:	pH 4.00: (± pH 0.2) Y / N pH 7.00: (± pH 0.2) Y / N EC: (± 150µS/cm) Y / N			
		YSI #	100% Saturation? Y N	0% Calibration? Y N NA	pH 4.00 Y / N pH 7.00 Y / N EC: 1,413µS/cm Y / N		pH 4.00: pH 7.00: Temp: EC:	pH 4.00: (± pH 0.2) Y / N pH 7.00: (± pH 0.2) Y / N EC: (± 150µS/cm) Y / N			
		YSI #	100% Saturation? Y N	0% Calibration? Y N NA	pH 4.00 Y / N pH 7.00 Y / N EC: 1,413µS/cm Y / N		pH 4.00: pH 7.00: Temp: EC:	pH 4.00: (± pH 0.2) Y / N pH 7.00: (± pH 0.2) Y / N EC: (± 150µS/cm) Y / N			

APPENDIX

E

DATA QUALITY REVIEW

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Data Quality Review
PFAS Ongoing Monitoring Plan
Q1 2024 Monitoring Event

This appendix reviews the Quality Assurance (QA) and Quality Control (QC) documentation. Quality assurance encompasses the actions, procedures, checks and decisions undertaken to ensure sample integrity and representativeness, and the reliability and accuracy of analysis results. The QA documentation should also include an indication of the Data Quality Objectives sought in relation to each significant action, test or process involved in the assessment.

QC activities measure the effectiveness of the QA procedures by undertaking testing, and then comparing results to previously established objectives. QC work will include the internal laboratory testing as well as results of QC samples submitted such as trip blanks and duplicates. The quality of the information and/or data is deemed satisfactory when the QC results demonstrate that agreed objectives have been met.

QA/QC Aspects	Evidence & Evaluation
	QA Documentation
Project Quality Plan/Work Plan and Data Quality Objectives	The field investigation was carried out between the 11th and 13th March 2023 and is generally in accordance with the proposed scope of work, as documented in the SAQP (PFAS OMP SAQP HMAS Stirling, Cardno, February 2024, Rev13) issued to the client and in general compliance with Standards Australia 1998. AS/NZ 5667:1998 *Water quality – sampling,* NEPM "*National Environment Protection (Assessment of Site Contamination) Measure"* and PFAS NEMP 2.0. A quality control program was implemented during the Investigation and the quality assurance procedures used have been reiterated in the report (PFAS OMP Q1 2024 Factual Report). In addition, a safety, health and environment work method statement (SHEWMS) was also prepared. The Data Quality Objectives were expressed in terms of the purpose of the assessment and the relevant assessment criteria.
	Data Representativeness
Use of Composites	No Composites were used during the investigation
Holding Times	Chain of custody and laboratory reports provide evidence of holding times. Holding times generally complied with required timeframes, with the following exception: ▪ EP2403147, sample ID: PW316 – dissolved major cations (1 day overdue).
Verification of field procedures	The methodology conducted during this investigation is documented in the body of the report and was in general conformance with the SAQP. Non-disposable equipment was decontaminated between sample locations.
Laboratory Reports	The following laboratory reports were considered for this data quality review: ▪ ALS reports: EP2403138, EP2403139, EP2403140, EP2403147, EP2403148, EP2403149, EP2403150, EP2403151, EP2403152, EP2403216, EP2403217, EP2403218, EP2403219, EP2403220, EP2403224, EP2403225, EP2403226, EP2403250, EP2403295, EP2403297, EP2403298, EP2403299. ▪ Eurofins report: 1078840

<table>
<tr><th>QA/QC Aspects</th><th>Evidence & Evaluation</th></tr>
<tr><td colspan="2">Data Precision & Accuracy</td></tr>
<tr><td>QC sample Frequency</td><td>
<table>
<tr><th>QC sample type</th><th>SAQP required frequency</th><th>Sample Collected</th></tr>
<tr><td>Blind duplicate</td><td>1 in 10 primary samples (10%)</td><td>7 for 60 groundwater samples (11.7%)
4 for 39 porewater samples (10.3%)
3 in 28 surface water samples (10.7%)
4 in 39 sediment samples (10.3%)</td></tr>
<tr><td>Interlab duplicate</td><td>1 in 10 primary samples (10%)</td><td>7 for 60 groundwater samples (11.7%)
4 for 39 porewater samples (10.3%)
3 in 28 surface water samples (10.7%)
4 in 39 sediment samples (10.3%)</td></tr>
<tr><td>Rinsate</td><td>1 per field crew per day</td><td>8 for 3 days (2 to 3 field personnel/day) (100%)</td></tr>
<tr><td>Field Blank</td><td>1 per field crew per day</td><td>8 for 3 days (2 to 3 field personnel/day) (100%)</td></tr>
</table>
The required QC frequency was achieved for all sample types.</td></tr>
<tr><td>RPD Acceptance criteria</td><td>
<table>
<tr><th>Magnitude of Results</th><th>Acceptable RPD range</th></tr>
<tr><td>< 10 x LOR</td><td>No limits</td></tr>
<tr><td>10 – 20 LOR</td><td>0% - 50%</td></tr>
<tr><td>> 20 x LOR</td><td>0% - 20%</td></tr>
</table></td></tr>
<tr><td>QC Testing – Blind Duplicates (Primary Lab)</td><td>
Groundwater
▪ Primary Groundwater Samples Analysed: 60
▪ Blind Duplicate Samples Analysed: 7
RPDs were within acceptance criteria with one exception for QC113/MW228 (PFPeA – 22%) This minor exceedance is likely due to the low analyte concentration. The higher value (primary sample) has been adopted for the assessment (conservative approach).
Porewater
▪ Primary porewater Samples Analysed: 39
▪ Blind Duplicate Samples Analysed: 4
All RPDs were within acceptance criteria.
Surface water
▪ Primary surface water Samples Analysed: 28
▪ Blind Duplicate Samples Analysed: 3
All RPDs were within acceptance criteria with one exception for QC112/SW305 (PFOS – 130%). This exceedance is likely due to the low analyte concentration. The higher value (primary sample) has been adopted for the assessment (conservative approach).
Sediment
▪ Primary Sediment Samples Analysed: 39
▪ Blind Duplicate Samples Analysed: 4
All RPDs were within acceptance criteria.</td></tr>
</table>

QA/QC Aspects	Evidence & Evaluation
QC Testing – Interlab Duplicates (Secondary Lab)	***Groundwater*** ▪ Primary Groundwater Samples Analysed: 60 ▪ Interlab Duplicate Samples Analysed: 7 RPDs were within acceptance criteria with the following exceptions: o QC201 (PFHxS – 46%) o QC209 (PFHpS – 21%) o QC213 (PFPeS – 63%, PFHxS – 49%, PFBA – 43%, PFPeA – 38%, PFOA – 40%) o QC216 (PFHxS – 155%). These RPDs differences are generally minor, and likely due to the differences of methodologies between the primary and secondary laboratories and/or low concentrations of analytes under review. The higher concentrations were adopted for this assessment (conservative value reported on). This is not considered to have impacted the validity of the interpretation drawn upon this dataset. ***Porewater*** ▪ Primary porewater Samples Analysed: 39 ▪ Interlab Duplicate Samples Analysed: 4 All RPDs were within acceptance criteria. ***Surface water*** ▪ Primary surface water Samples Analysed: 28 ▪ Interlab Duplicate Samples Analysed: 3 All RPDs were within acceptance criteria with one exception: QC212/SW305 (PFOS – 48%) which is likely due to the low analyte concentration. The higher concentration (primary sample) was adopted for this assessment (conservative value reported on). This is not considered to have impacted the validity of the interpretation drawn upon this dataset. ***Sediment*** ▪ Primary sediment Samples Analysed: 39 ▪ Interlab Duplicate Samples Analysed: 4 All RPDs were within acceptance criteria.
Field Blanks	Field Blanks were collected at a rate of one per fieldwork day per field personnel. All field blank samples tested reported analytes below the laboratory limit of reporting.
Laboratory Internal QC	Evidence of the laboratories internal QC testing is present and complete in the reports. ALS (Primary) performed internal QC with adequate testing and satisfactory results for method blank, matrix spikes, laboratory control samples and laboratory duplicates. All Method Blank results were within acceptable range. All Laboratory Control results were within acceptable range with the exception of the following: ▪ EP2403218: - EtFOSA recovery (142%) greater than upper control limit (138%). ▪ EP2403219: - EtFOSA recovery (142%) greater than upper control limit (138%). All Matrix Spikes generally reported recoveries within the acceptance range of 70% to 130% with the exception of the following: ▪ EP2403140, EP2403147: - Samples ID: PW335, SW353, Anonymous: Sulfate and Chloride matrix spike recoveries not determined due to the background concentrations exceeding 4x spike level. ▪ EP2403149, EP2403151: - Samples ID: QC105, Anonymous: Chloride matrix spike recovery not determined due to the background concentrations exceeding 4x spike level.

QA/QC Aspects	Evidence & Evaluation
	▪ EP2403219: - Samples ID: SW372: Sulfate and Chloride matrix spike recoveries not determined due to the background concentrations exceeding 4x spike level. - Sample ID: Anonymous: EtFOSA recovery greater than upper data quality objective The frequency of laboratory QC samples was generally achieved with the exception of the following: ▪ EP2403140: - Laboratory Duplicates: PFAS by LCMSMS, expected frequency 10% not achieved. - Matrix Spikes: PFAS by LCMSMS, expected frequency 5% not achieved. ▪ EP2403138: - Laboratory Duplicates: Major cations - dissolved, expected frequency 10% not achieved. - Matrix Spikes: PFAS by LCMSMS, expected frequency 5% not achieved. ▪ EP2403147: - Laboratory Duplicates: Major cations - dissolved, expected frequency 10% not achieved. The above outliers/exceptions are not considered to affect the reliability of the dataset.
Laboratory Method Detection Limit	Laboratory reports indicate the method detection limits were generally lower than the respective assessment criteria.
NATA endorsement of laboratory reports	Laboratory reports were stamped with the NATA endorsement stamp and signature. ALS Accreditation No. 825 Eurofins ARL Accreditation No. 1261
Calibration of Field Equipment	All equipment used during the investigation was calibrated by the supplier prior to use and daily readings of reference solutions (bump tests) were completed. The equipment calibration certificates, and daily field bump test records are provided in Appendix D.
Decontamination and Equipment Blanks	Rinsate blanks were collected at a rate of one per day per field personnel when reusable equipment was used. All rinsate samples tested reported analytes concentrations below the laboratory LORs.
	Data Comparability
Standard Procedures	Fieldwork procedures are detailed in the SAQP and reports and are comparable for each phase of Investigation.
Qualified Personnel	Staff involved in managing and reviewing the project and those involved in fieldwork are experienced and qualified personnel.
Sample Integrity	Field Chain of Custody/Laboratory request forms can be found in Appendix C.
	Data Completeness
Completeness of test program	The scope of work undertaken was generally consistent with the SAQP.
Validity of Data Set	The data quality review indicates no significant systematic errors in the data collection process and therefore, the data set used as the basis for groundwater, surface water, porewater and sediment investigation is considered valid and complete.

PFAS OMP Quarterly Sampling Event Factual Report

March 2024

HMAS Stirling

304700525



Prepared for
Department of Defence

25 June 2024

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

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Chemical Names

DO	Dissolved Oxygen
PFAS	Per- and Poly-fluoroalkyl Substances
PFHxS	Per-fluorohexane Sulfonate
PFOA	Per-fluorooctanoic Acid
PFOS	Per-fluorooctane Sulfonate

Technical Terms

AFFF	Aqueous Film Forming Foam
AHD	Australian Height Datum
AS	Australian Standard
BGL	Below Ground Level
COC	Chain of Custody
DQI	Data Quality Indicator
DQO	Data Quality Objective
DSI	Detailed Site Investigation
DWER	Department of Water and Environmental Regulation
EC	Electrical Conductivity
EPA	Environment Protection Authority
ERA	Ecological Risk Assessment
ESA	Environmental Site Assessment
HEPA	Heads of Environmental Protection Authority
LOR	Limit of Reporting
N/A	Not Applicable
NATA	National Association of Testing Authorities
NEPC	National Environment Protection Council
NEMP	National Environmental Management Plan
NEPM	National Environmental Protection Measure
ORP	Oxidation Reduction Potential
PSI	Preliminary Site Investigation
QA	Quality Assurance
QC	Quality Control
RPD	Relative Percentage Difference
RWL	Reduced water levels
SAQP	Sampling and Analysis Quality Plan
SWL	Standing water level

Units

ha	Hectares
mAHD	Metres relative to the Australia Height Datum
mBGL	Metres Below Ground Level
mbTOC	Metres below Top of Casing
mg/kg	Milligram per Kilogram (approximately equivalent to ppm)
mg/L	Milligram per Litre
mV	Millivolt
µg/L	Microgram per Litre
µS/cm	Micro Siemens per Centimetre (Electrical Conductivity – Water)

Site Specific

OMP	Ongoing Monitoring Plan
FTA	Fire Training Area
HSF	Helicopter Support Facility

1 Introduction

1.1 Background

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

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

> Cardno, May 2024, Reference: DEF19009, *PFAS Ongoing Monitoring Plan Sampling and Analysis Quality Plan (SAQP) HMAS Stirling.* Rev 14.

The SAQP was reviewed and updated prior to the Q2 2024 monitoring event and monitoring wells MW553 and MW468 were added to the monitoring network in replacement of wells MW261 and MW197 respectively.

For the purposes of this report:

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

1.2 Purpose & Objectives

The objective of the OMP is to assess the changes in the nature and extent of PFAS within the environment, specifically where there is an identified potentially elevated risk to a receptor or a potential future risk to a receptor associated with Defence's historical use of legacy Aqueous Film Forming Foam (AFFF). The PFAS source areas are shown on Figure 1B, Appendix A.

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

The objectives of the report are to provide:

> A succinct summary of the Q2 2024 sampling event and provision of analytical results with supporting tables and figures.

> Confirmation of the current understanding of risk.

> Supporting data for the assessment of management actions, where relevant.

1.3 Relevant Guidelines

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

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

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

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

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

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

[1] It is acknowledged that AS4482 has been withdrawn, it is referred to here as a state of knowledge only.

- Department of Water and Environmental Regulation (DWER), 2021, *Assessment and Management of Contaminated Sites*[2].
- Department of Defence, Department of Energy, 2018, *Quality System Manual Schedule B15*.
- U.S. Environmental Protection Agency (EPA), 2000, *Guidance for the Data Quality Objectives Process (EPA QA/G-4)*.
- U.S. EPA, 2002, *Guidance on Environmental Data Verification and Data Validation (EPA QA/G-8).*
- National Health and Medical Research Council (NHMRC), August 2019, *Guidance on Per and Polyfluoroalkyl Substances (PFAS) in Recreational Water*.

2 Scope of Work

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

2.1 Groundwater Monitoring

Sampling of selected groundwater monitoring wells was performed in general accordance with the SAQP (Cardno, 2024), applying methods set out in Section 3.1 of this report. The groundwater wells monitored as part of the OMP are presented in Table 2-1, and are shown on Figures 2A and 2B, Appendix A.

Table 2-1 Groundwater Monitoring Locations

Monitoring Area	Location ID	No.
Demolition Ground	MW139, MW141, MW142, MW147, MW149	5
Fire Training Area	MW109, MW112, MW500, MW120, MW121, MW123, MW124, MW125, MW126, MW127, MW128	11
Wastewater treatment plant	MW158, MW161, MW166, MW171, MW173, MW193, MW195D, MW195S, MW196, MW199, MW200, MW202, MW203, MW468	14
Accommodation Area	MW288, MW289	2
Dredged Sediments	MW268, MW269	2
AVCAT Storage and Fuel Farm	MW233, MW236, MW238, MW239, MW240, MW242, MW243, MW245, MW249, MW496, MW516	11
Fire Station, Flammable / Hazardous Goods and Waste Storage, Ship Sullage	MW010, MW255, MW256, MW257, MW258, MW259, MW553	5
Helicopter Support Facility	MW214, MW215, MW216, MW217, MW220, MW224, MW225, MW226, MW227, MW228, MW282	11

2.2 Porewater, Surface Water and Sediment Monitoring

Porewater, sediment and surface water sampling were performed in general accordance with the SAQP (Cardno, 2024), applying methods set out in Sections 3.2 and 3.3 of this report. The porewater, surface water and sediment monitoring locations monitored as part of the OMP are presented in Table 2-2, and are shown on Figures 3A to 5B, Appendix A.

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

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

Monitoring Area	Porewater Sampling Location ID	No.	Sediment Sampling Location ID	No.	Surface Water Sampling Location ID	No.
Demolition Ground	PW329, PW330, PW331, PW356, PW357, PW358	6	SD329, SD330, SD331, SD356, SD357, SD358	6	SW150, SW152, SW154, SW156	4
Fire Training Area	PW335, PW340, PW341, PW362, PW363, PW364	6	SD335, SD340, SD341, SD362, SD363, SD364	6	SW130, SW132, SW134	3
WWTP	PW304, PW345, PW367, PW368, PW369, PW350, PW351, PW352, PW380, PW381, PW401	11	SD304, SD345, SD367, SD368, SD369, SD350, SD351, SD352, SD380, SD381, SD401	11	SW305, SW370, SW371, SW372, SW373, SW353, SW382, SW383, SW384	9
Accommodation Area	PW346	1	SD346	1		
Dredged Sediments	PW374, PW375, PW378	3	SD374, SD375, SD378	3	SW317, SW318, SW319	3
Helicopter Support Facility	PW306, PW307, PW308, PW314, PW315, PW316, PW405, PW407, PW409, PW411, PW413, PW415	12	SD306, SD307, SD308, SD314, SD315, SD316, SD405, SD407, SD409, SD411, SD413, SD415	12	SW309, SW310, SW311, SW406, SW408, SW410, SW412, SW414, SW416	9

2.3 Data Management

All the data included in the report has been collected, uploaded, and reviewed according to the data management requirements of the *Defence Contamination Management Manual* (DCMM) Annex L (Defence, 2021), including:

- The sample naming convention detailed in the DCMM Annex L was used in the field;
- All field data collected was uploaded to the Esdat database;
- Laboratory data was uploaded and approved; and
- QA/QC data was reconciled.

2.4 Deviations from the OMP SAQP

Deviations from the SAQP for the Q2 2024 monitoring event are presented in Table 2-3 below.

Table 2-3 Deviations from OMP SAQP

Location	Deviation	Comments/Impact
MW161	Not Sampled	Well was found dry. Limited impact, sufficient temporal data has been collected from this location.
MW172	Sampled	Location previously removed from the SAQP, was accessed in Q2 2024 to complete the OMP handover well assessment, and sampled. Positive impact on the dataset.
MW196	Not Sampled	Medium impact, well often found dry, other wells in area sampled.
MW242	Not Sampled	Blocked at 3.80mbgl. Limited impact, sufficient temporal data has been collected from this location.
MW282	Not Sampled	Well was found dry. Limited impact, nearby wells targeting the HSF source area were sampled.
MW224	No field parameters recorded	Insufficient water remaining in HydraSleeve. No impact, field parameters don't drive OMP risk-based decisions/triggers response

3 Methodology

3.1 Groundwater Sampling Methodology

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

Table 3-1 Groundwater Sampling Methodology

Activity	Details
Well Gauging	Standing water levels (SWL) were gauged using a dip meter. All wells were measured against a surveyed mark at the top of the well casing. Time of gauging was recorded on field records sheets.
Groundwater Field Parameters	Groundwater physicochemical parameters were recorded via a water quality meter from water remaining in the HydraSleeves® after samples are collected or hand-bailed water. The following physicochemical parameters were recorded: ▪ pH ▪ electrical conductivity (EC) ▪ oxidation reduction potential (ORP) ▪ Dissolved oxygen (DO) ▪ Temperature Once physicochemical parameters had stabilised (as indicated by at least three consecutive measurements falling within +/- 10% of each other) measurements were recorded on field data records. All field instruments (e.g. water quality meter) were calibrated by the equipment supplier and bump tested daily to minimize the accuracy of the measurements taken. Calibration certificates and bump test records are provided in Appendix D.
Deployment of HydraSleeve®	HydraSleeve® were deployed with top weight for sample collection to begin at the lowest point. HydraSleeve's target depth was recorded on field records for each location.
Retrieval of HydraSleeve® (Sample Collection)	HydraSleeve® sampling devices were left in wells for a minimum of 24 hours to allow restabilisation of the well following the slight disturbance caused by sampler deployment. HydraSleeve® used during Q2 2024 were the ones deployed following Q1 2024. Samples were collected via continuous pull method at a rate allowing the water to pass through the check value into the sample sleeve. Samples were discharged immediately (minimize changes in chemistry) via discharge tube.
Hand bailing (alternative sampling method)	Disposable HDPE hand bailers, attached to a polypropylene string, were used at wells where the water column wasn't sufficient to fill the HydraSleeve®. Purging of the well was undertaken prior to sampling to ensure that a sample representative of the aquifer is taken (i.e. removal of 3x well volume).
Decontamination procedure	Dedicated HydraSleeve® and HDPE hand bailers (single use and disposable) were used at each groundwater well thus removing the need for decontamination. All re-usable sampling equipment was thoroughly washed using PFAS & phosphate-free detergent, then double rinsed with clean water before the sample collection.
Sample identification, preservation transport and holding times	Each sample bottle was pre-labelled by the laboratory with a unique barcode. Samples were collected directly into appropriately preserved laboratory supplied bottles (Teflon-free) and packed in chilled containers for delivery to the laboratory under Chain of Custody (CoC) documentation. Sample containers, preservation procedures, sample storage requirements and holding times were undertaken in accordance with those recommended by Standards Australia (AS/NZS 5667.1:1998 and AS 4482.1 as appropriate). Where holding times did not comply, this is discussed in the data quality review in Appendix E.

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

3.2 Porewater and Sediment Sampling Methodology

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

Table 3-2 Sediment Sampling Methodology

Item	Details
Sample Collection	Sediment samples were collected at the sediment/water interface using hand tools (e.g. trowel, hand auger, PVC pipe etc.) with samples placed directly into appropriately labelled, laboratory supplied sample containers and packed in chilled containers for delivery to the laboratory under CoC documentation.
Field Parameters	At each sampling location, the sediment sample was visually assessed, and observations (including physical description) were recorded on field data sheets.
Decontamination	All re-usable sampling equipment was thoroughly washed using PFAS-free detergent, then double rinsed with clean water before the sample collection.
Quality Control	Sediment QC samples were collected at the following frequencies: ▪ Field duplicate (intra-laboratory) samples greater than 1 per 10 primary samples. ▪ Field triplicate (inter-laboratory) samples greater than 1 per 10 primary samples sent to a secondary laboratory.
Laboratory Testing	Sediment samples were submitted for the following analysis: ▪ Full PFAS analytical suite (refer to the SAQP for full list of analytes).

Table 3-3 Porewater Sampling Methodology

Item	Detail
Porewater Sample Collection	Porewater sampling was undertaken in accordance with the U.S. EPA guidance *Operating Procedure Pore Water Sampling*. Porewater was purged and sampled at less than 1 L per minute using a peristaltic pump, connected to a stainless steel tube with a screened section at its base (Drive-Point Piezometer). The porewater sampler was inserted to at least 1 m below the surficial marine sediments, to ensure collection of pore water rather than surface water. Tubing was replaced at each sampling location to prevent cross-contamination.
Field parameters	The following physicochemical parameters were recorded using a pre-calibrated water quality meter: ▪ pH ▪ EC ▪ ORP ▪ DO ▪ Temperature

Item	Detail
Decontamination	All re-usable sampling equipment was thoroughly washed using PFAS-free detergent, then double rinsed with clean water before the sample collection.
Sample identification, preservation, transport and holding times.	As detailed in Table 3-1.
Quality Control	Porewater QC samples were collected at the following frequencies: ▪ Field duplicate (intra-laboratory) samples at 1 per 10 water samples or 1 per batch if the batch was less than 10 samples. ▪ Field triplicate (inter-laboratory) samples at 1 per 10 water samples sent to a secondary laboratory.
Laboratory Testing	Porewater samples were submitted for the same analysis as groundwater samples (refer to Table 3-1).

3.3 Surface Water Sampling Methodology

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

Table 3-4 Surface water Sampling Methodology

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

3.4 Quality Control / Quality Assurance

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

> QA documentation.

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

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

3.5 Assessment Criteria

3.5.1 Groundwater, Porewater and Surface Water

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

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

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

Notes:

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

3.5.2 Sediment

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

4 Field Observations and Results

4.1 General Site Observations

The Q2 2024 monitoring event was completed between 27 and 29 May 2024. No significant weather events or site activities that could have impacted the reliability of the results obtained were noted during Q2 2024.

The daily maximum temperature during the monitoring event varied between 18.3 and 21.9°C. Between 3.2 and 20.0 mm of daily rainfall amount were recorded during the monitoring event.

4.2 Groundwater

4.2.1 Summary of Field Observations

4.2.1.1 Physicochemical parameters

Stabilised physicochemical parameters, water colour and turbidity observations recorded during the groundwater sampling event are presented in field sampling records, included in Table D1, Appendix D.

Field parameters were generally consistent with previous monitoring events. Groundwater pH ranged from 6.93 (MW141) to 8.27 (MW233) and was near neutral to slightly alkaline, and water was observed clear to cloudy/brown in colour. Groundwater temperature ranged from 16.2°C (MW243) to 21.9°C (MW173). DO readings ranged from 0.27 mg/L (MW125) to 5.79 mg/L (MW193) which indicates aerobic groundwater conditions. EC readings ranged from 285.5 µS/cm (MW233) to 53,365 µS/cm (MW195D) and indicate fresh to highly saline groundwater conditions. There was a sulphur odour noted at MW109, MW124, MW225 and MW227.

4.2.1.2 Groundwater Elevation and Migration

Groundwater gauging data and reduced water levels (RWL) are provided within the field records in Table D1, Appendix D. The groundwater elevations ranged between -0.367 mAHD (MW289) and 2.478 mAHD (MW193) which is consistent with previous monitoring events. It is expected that groundwater levels and flow direction for monitoring well relatively close to the shoreline are locally and temporally influenced by tidal pressures.

Gauging data was used to infer the groundwater migration contours. Groundwater flow was interpreted to be radial from the site and towards areas of depression following local topography (i.e. groundwater generally flows towards the nearest coastline), which is consistent with previous monitoring events. Groundwater inferred elevation contours and inferred flow direction for the Q2 2024 monitoring event are shown in Figure 6, Appendix A. It is noted that no contours could be interpreted for the demolition ground due to the limited number of wells and their proximity to each other.

4.2.2 Laboratory Results

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

Table 4-1 Summary of Groundwater Results Exceeding Adopted Criteria

Analytes	Locations Exceeding Criteria	Lowest Criteria (µg/L)	Max Conc. (µg/L)	No. Analytical Results[1]	No. Results Above Criteria
PFOA	MW112, MW123, MW141, MW172, MW193, MW256, MW258	0.56[2]	1.55 (MW258)	59	7
Sum of PFOS and PFHxS	MW109, MW112, MW120, MW121, MW123, MW125, MW128, MW141, MW142, MW147, MW166, MW171, MW172, MW173, MW193, MW215, MW216, MW220, MW228, MW238, MW239, MW249, MW255, MW256, MW257, MW258, MW259, MW268, MW269, MW288, MW289, MW496, MW500, MW516	0.07[2]	63.3 (MW500)	59	34
PFOS	MW109, MW112, MW120, MW121, MW123, MW128, MW141, MW142, MW147, MW166, MW171, MW172, MW173, MW193, MW195D, MW202, MW215, MW216, MW217, MW220, MW224, MW233, MW240, MW249, MW255, MW256, MW257, MW258, MW259, MW269, MW288, MW289, MW496, MW500, MW516	0.01[3]	62.9 (MW282)	59	35

Notes:

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

Findings are summarised as follows:

- No first-time detection of Sum of PFOS and PFHxS or PFOA above the LOR were reported for the groundwater monitoring locations in Q2 2024.
- A new exceedance of the Drinking water criteria (0.07 µg/L) was recorded at MW238 located at the AVCAT Storage area (0.14 µg/L recorded).

4.3 Surface Water

4.3.1 Summary of Field Observations

4.3.1.1 Physicochemical parameters

Stabilised physiochemical parameters and observations recorded during the surface water sampling program are presented in field sampling records, included in Table D3, Appendix D. Parameters were generally consistent with the previous monitoring events. Surface water pH ranged from 7.74 (SW130) to 8.13 (SW353) and was slightly alkaline, temperature was 17.9°C on average, water colour was clear, and EC readings ranging 31,652 µS/cm (SW134) to 35,715 µS/cm (SW384) indicate saline surface water conditions. DO readings ranging 2.95 mg/L (SW130) to 8.99 mg/L (SW408) indicate aerobic surface water conditions. No visual or olfactory evidence of contamination were recorded.

4.3.2 Laboratory Results

The results of laboratory analysis have been compared against adopted assessment criteria. A summary of results exceeding the adopted criteria is presented in Table 4-2. Laboratory results have also been compared to available historical data to identify monitoring locations where a first-time detection of Sum of PFOS and PFHxS or PFOA or a new exceedance of guideline values, were reported. Figures 3A and 3B in Appendix A present the surface water monitoring locations. Tabulated results including non-PFAS analytes are presented in Table B1, Appendix B and the laboratory reports are provided in Appendix C.

Table 4-2 Summary of Surface water Results Exceeding Adopted Criteria

Analytes	Locations Exceeding Criteria	Lowest Criteria (µg/L)	Max Conc. (µg/L)	No. Analytical Results[1]	No. Results Above Criteria
PFOA	-	0.56[2]	<0.01 (all)	28	0
Sum of PFOS and PFHxS	-	0.07[2]	0.06 (SW373)	28	0
PFOS	SW318, SW370, SW371, SW372, SW373	0.01[3]	0.06 (SW373)	28	5

Notes:

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

Findings are summarised as follows:

- No first-time detection of Sum of PFOS and PFHxS or PFOA above the LOR were reported for the surface water monitoring locations in Q2 2024.
- No new exceedance of a guideline value was reported for the surface water monitoring locations in Q2 2024.

4.4 Porewater

4.4.1 Summary of Field Observations

4.4.1.1 Physicochemical parameters

Stabilised physiochemical parameters, water colour and turbidity observations recorded during the porewater sampling program are presented in field sampling records, included in Table D2, Appendix D. Parameters were generally consistent with the previous monitoring events. Porewater pH ranging 7.49 (PW316) to 8.07 (PW351) was near neutral to slightly alkaline, with an average temperature of 17.5°C. Water was generally clear. EC readings ranging 24,361 µS/cm (PW374) to 54,204 µS/cm (PW308) indicate highly saline porewater conditions. DO readings ranging 3.49 mg/L (PW363) to 7.46 mg/L (PW356) indicate anaerobic to aerobic porewater condition.

4.4.2 Laboratory Results

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

Table 4-3 Summary of Porewater Results Exceeding Adopted Criteria

Analytes	Locations Exceeding Criteria	Lowest Criteria (µg/L)	Max Conc. (µg/L)	No. Analytical Results[1]	No. Results Above Criteria
PFOA	-	0.56[2]	<0.01 (all)	37	0
Sum of PFOS and PFHxS	PW346, PW374, PW375, PW378	0.07[2]	0.22 (PW346)	37	4
PFOS	PW304, PW307, PW340, PW346, PW356, PW363, PW364, PW368, PW369, PW374, PW375, PW378, PW409	0.01[3]	0.19 (PW346)	37	13

Notes:

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

Findings are summarised as follows:

> There was no first-time detection of Sum of PFOS and PFHxS or PFOA, or new exceedance of a guideline value for the porewater locations during Q2 2024.

4.5 Sediment

4.5.1 Summary of Field Observations

Observations recorded during the sediment sampling program are provided in the field sampling records within Appendix D. Sediment samples were generally described as grey/beige, fine to medium grained, wet sand.

4.5.2 Laboratory Results

The results of laboratory analysis have been compared to available historical data. Figures 5A and 5B in Appendix A present the sediment monitoring locations. Tabulated results are presented in Appendix B and the laboratory reports are provided in Appendix C.

Findings are summarised as follows:

> No first-time detection of Sum of PFOS and PFHxS or PFOA was reported for the sediment monitoring locations in Q2 2024.

4.6 Changes to the Monitoring Network Condition

The following changes to the OMP monitoring network were noted during Q2 2024:

> MW010 has been repaired (damaged casing removed and monument converted to a glush gatic) and re-surveyed.

> MW553 adopted as a replacement well for MW261 (lost).

> The following wells were airlifted prior to Q2 2024 to remove silt/sediment presence at the bottom of the screen casing: MW147, MW128, MW158, MW161, MW166, MW258 and MW259.

5 Summary and Conclusions

Cardno undertook the Q2 2024 groundwater, porewater, surface water and sediment monitoring event at HMAS Stirling as part of the PFAS OMP. Sampling and testing was undertaken at 59 groundwater monitoring wells, 28 surface water locations and 37 co-located sediment and porewater sampling locations.

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

The groundwater laboratory results reported the following:

- Of the 59 samples that were tested, PFOA (7 samples), PFOS (35 samples) and Sum of PFOS and PFHxS (34 samples) reported concentrations that exceeded adopted assessment criteria.
- No first-time detection of Sum of PFOS and PFHxS or PFOA above the LOR were reported for the groundwater monitoring locations in Q2 2024.
- A new exceedance of the Drinking water criteria (0.07 µg/L) was recorded at MW238 located at the AVCAT Storage area (0.14 µg/L recorded).

The surface water laboratory results reported the following:

- Of the 28 samples tested, PFOS (5 samples) were reported above the adopted assessment criteria.
- No first-time detection of Sum of PFOS and PFHxS or PFOA above the LOR were reported for the surface water monitoring locations in Q2 2024.
- No new exceedance of a guideline value was reported for the surface water monitoring locations in Q2 2024.

The porewater laboratory results reported the following:

- Of the 37 samples that were tested, PFOS (13 samples) and Sum of PFOS and PFHxS (4 samples) reported concentrations above adopted assessment criteria.
- There was no first-time detection of Sum of PFOS and PFHxS or PFOA, or new exceedance of a guideline value for the porewater locations during Q2 2024.

The sediment laboratory results reported the following:

- No first-time detections were reported for the sediment monitoring locations in Q2 2024.

The next OMP sampling event for HMAS Stirling will be the scheduled after the PFAS OMP review. An Ongoing Monitoring Report is being drafted for the October 2022 – September 2023 monitoring period.

6 References

General References

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3. *Contaminated Sites Act 2003*, Western Australia.
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6. Department of Water and Environmental Regulation (DWER), 2021, *Assessment and Management of Contaminated Sites*.
7. Department of Water and Environment Regulation (DWER), 2018, Perth Groundwater Atlas, (https://maps.water.wa.gov.au/#/webmap/gwm).
8. Environmental Protection Agency (United States EPA), November 2002, Reference: EPA/240/R-02/004, *Guidance on Environmental Data Verification and Data Validation.*
9. The Heads of EPAs Australia and New Zealand (HEPA; 2020) *PFAS National Environmental Management Plan (NEMP) 2.0*, January 2020.
10. National Environment Protection Council (NEPC), 1999, *National Environmental Protection (Assessment of Site Contamination) Measure* (as amended), registered May 2013.
11. National Health and Medical Research Council (NHMRC) (2011 – updated 2022) *National Water Quality Management Strategy Australian Drinking Water Guidelines 6*, September 2022.
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Site Specific References

16. Department of Defence, January 2019, *HMAS Stirling Garden Island PFAS Management Area Plan*, Final.
17. Cardno, May 2024, *PFAS Ongoing Monitoring Plan Sampling and Analysis Quality Plan (SAQP) HMAS Stirling*. Rev 14.
18. Cardno, 16 April 2020, *PFAS OMP 2019 Q4 Quarterly Monitoring Factual Report*, HMAS Stirling.
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20. Cardno, 23 September 2020, *PFAS OMP 2020 Q2 Quarterly Sampling Event Factual Report*, HMAS Stirling.
21. Cardno, 22 January 2021, *PFAS OMP 2020 Q3 Quarterly Sampling Event Factual Report*, HMAS Stirling.
22. Cardno, March 2021, *PFAS OMP 2020 Q4 Quarterly Sampling Event Factual Report*, HMAS Stirling.
23. Cardno, June 2021, *PFAS OMP 2021 Q1 Quarterly Sampling Event Factual Report*, HMAS Stirling.
24. Cardno, August 2021, *PFAS OMP 2021 Q2 Quarterly Sampling Event Factual Report*, HMAS Stirling.
25. Cardno, September 2021, *PFAS OMP – 2020 Annual Interpretive Report*, HMAS Stirling.
26. Cardno, November 2021, *PFAS OMP 2021 Q3 Quarterly Sampling Event Factual Report*, HMAS Stirling.
27. Cardno, April 2022, *PFAS OMP 2021 Q4 Quarterly Sampling Event Factual Report*, HMAS Stirling.

28. Cardno, now Stantec, May 2023, *PFAS OMP 2021 Annual Interpretive Report.*

29. Cardno, now Stantec, July 2022, *PFAS OMP 2022 Q1 Quarterly Sampling Event Factual Report*, HMAS Stirling.

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32. Cardno, now Stantec, February 2023, *PFAS OMP 2022 Q4 Quarterly Sampling Event Factual Report*, HMAS Stirling.

33. Cardno, now Stantec, May 2023, *PFAS OMP 2023 Q1 Quarterly Sampling Event Factual Report*, HMAS Stirling.

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

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

APPENDIX

A

FIGURES

Cardno

now

Stantec

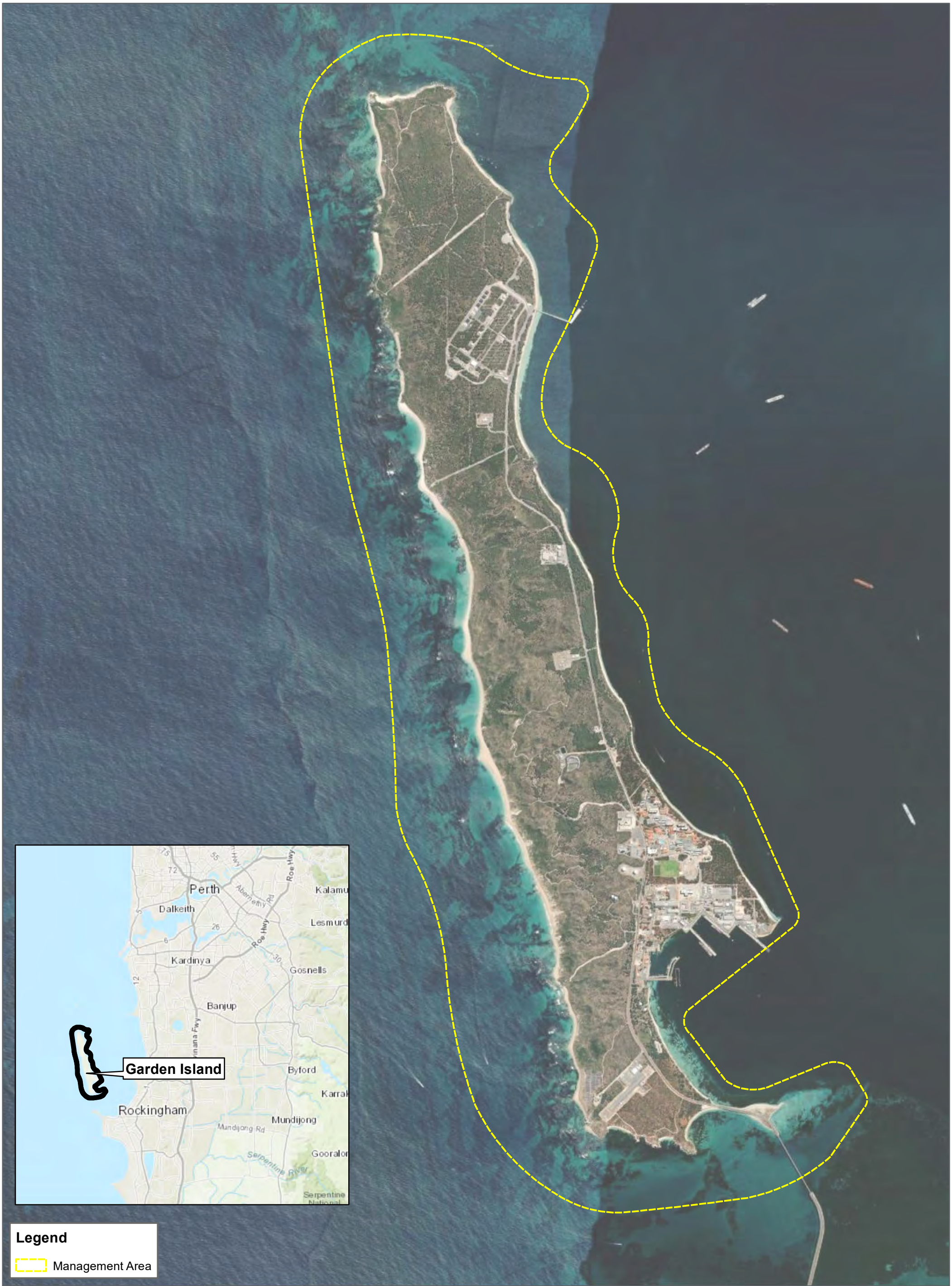

FIGURE 1A

1:32,000 Scale at A3

Metres

0 500 1,000

Site Location

Q2 2024 QUARTERLY SAMPLING EVENT
HMAS STIRLING
DEPARTMENT OF DEFENCE

Cardno

Map Produced by Cardno WA
Date: 2024-06-20 | Project: DEF19009
Coordinate System: GDA 1994 MGA Zone 50
Map: DEF19009_WA_0089-GS-001A_RegionalLocation 02.mxd
Aerial Imagery Supplied by Google Map



FIGURE 1B

1:32,000 Scale at A3

Metres

0 500 1,000

Management Area

Q2 2024 QUARTERLY SAMPLING EVENT
HMAS STIRLING
DEPARTMENT OF DEFENCE

Cardno

Map Produced by Cardno WA
Date: 2024-06-20 | Project: DEF19009
Coordinate System: GDA 1994 MGA Zone 50
Map: DEF19009_WA_0089-GS-001B_ManagementArea 01.mxd
Aerial Imagery Supplied by Google Earth & Metromap

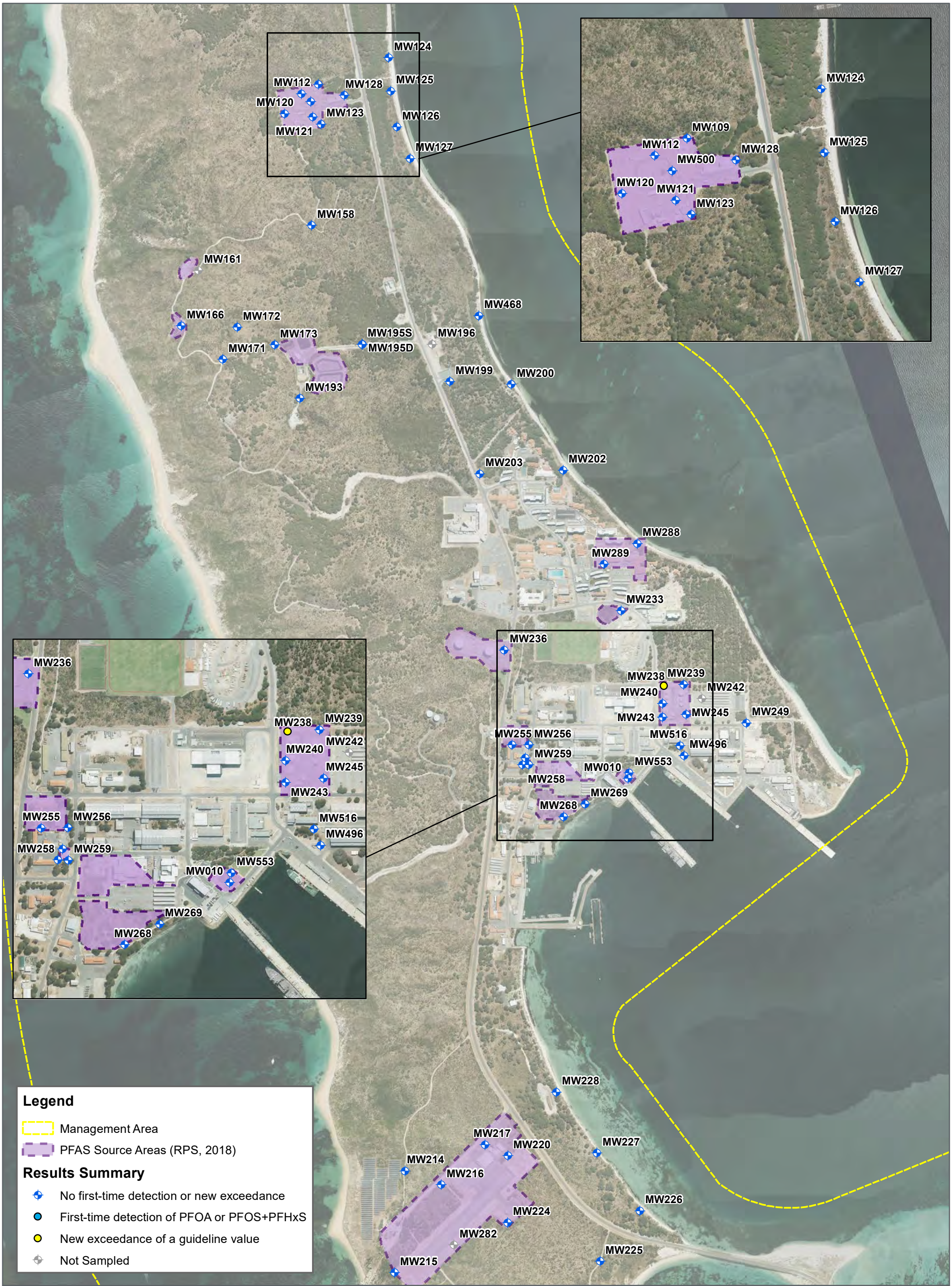
MW124
MW112
MW128
MW125
MW120
MW123
MW126
MW121
MW127
MW158
MW161
MW166
MW172
MW173
MW195S
MW196
MW171
MW195D
MW468
MW199
MW200
MW193
MW203
MW202
MW288
MW289
MW233
MW236
MW238
MW239
MW242
MW240
MW245
MW243
MW255
MW256
MW516
MW496
MW258
MW259
MW553
MW010
MW269
MW268
MW249
MW228
MW217
MW220
MW227
MW214
MW216
MW224
MW226
MW282
MW225
MW215
MW109
MW500
Legend
Management Area
PFAS Source Areas (RPS, 2018)
Results Summary
No first-time detection or new exceedance
First-time detection of PFOA or PFOS+PFHxS
New exceedance of a guideline value
Not Sampled
FIGURE 2A
1:12,500 Scale at A3
Metres
0
300
600
Groundwater Results
Q2 2024 QUARTERLY SAMPLING EVENT
HMAS STIRLING
DEPARTMENT OF DEFENCE
N
Cardno
Map Produced by Cardno WA
Date: 2024-06-20 | Project: DEF19009
Coordinate System: GDA 1994 MGA Zone 50
Map: DEF19009_WA_0089-GS-002A_2024Q2_GWResultSummary_PFAS 01.mxd
Aerial Imagery Supplied by Aerometrex



FIGURE 2B

1:15,000 Scale at A3

Metres

0 250 500

Groundwater Results

Q2 2024 QUARTERLY SAMPLING EVENT
HMAS STIRLING
DEPARTMENT OF DEFENCE

N

Cardno

Map Produced by Cardno WA
Date: 2024-06-20 | Project: DEF19009
Coordinate System: GDA 1994 MGA Zone 50
Map: DEF19009_WA_0089-GS-002B_2024Q2_GWResultSummary_PFAS 01.mxd
Aerial Imagery Supplied by Aerometrex



FIGURE 3A

1:15,000 Scale at A3

Metres

0 300 600

Surface water Results

Q2 2024 QUARTERLY SAMPLING EVENT
HMAS STIRLING
DEPARTMENT OF DEFENCE

N

Cardno

Map Produced by Cardno WA
Date: 2024-06-20 | Project: DEF19009
Coordinate System: GDA 1994 MGA Zone 50
Map: DEF19009_WA_0089-GS-003A_2024Q2_SWResultSummary_PFAS 01.mxd
Aerial Imagery Supplied by Aerometrex



FIGURE 3B

1:15,000 Scale at A3

Metres

0 300 600

Surface water Results

Q2 2024 QUARTERLY SAMPLING EVENT
HMAS STIRLING
DEPARTMENT OF DEFENCE

N

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Map Produced by Cardno WA
Date: 2024-06-20 | Project: DEF19009
Coordinate System: GDA 1994 MGA Zone 50
Map: DEF19009_WA_0089-GS-003B_2024Q2_SWResultSummary_PFAS 01.mxd
Aerial Imagery Supplied by Google Earth & Nearmap

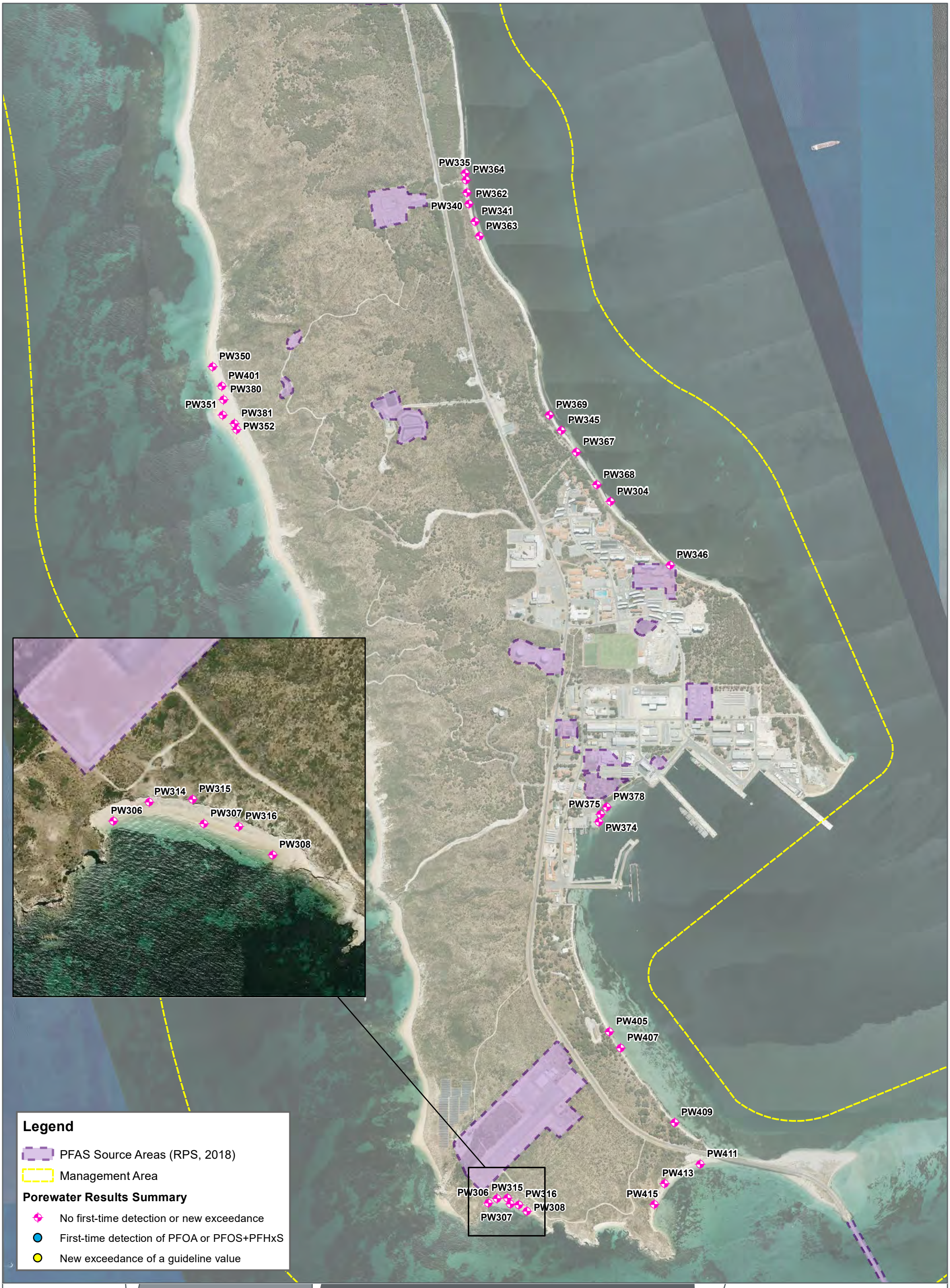

FIGURE 4A

1:15,000 Scale at A3

Metres

0 300 600

Porewater Results

Q2 2024 QUARTERLY SAMPLING EVENT
HMAS STIRLING
DEPARTMENT OF DEFENCE

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Date: 2024-06-20 | Project: DEF19009
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Aerial Imagery Supplied by Google Earth

PW356
PW331
PW357
PW330
PW358
PW329
PW356
PW358
PW357
PW329

Legend

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

Porewater Results Summary

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

FIGURE 4B

1:15,000 Scale at A3

Metres

0 300 600

Porewater Results

Q2 2024 QUARTERLY SAMPLING EVENT
HMAS STIRLING
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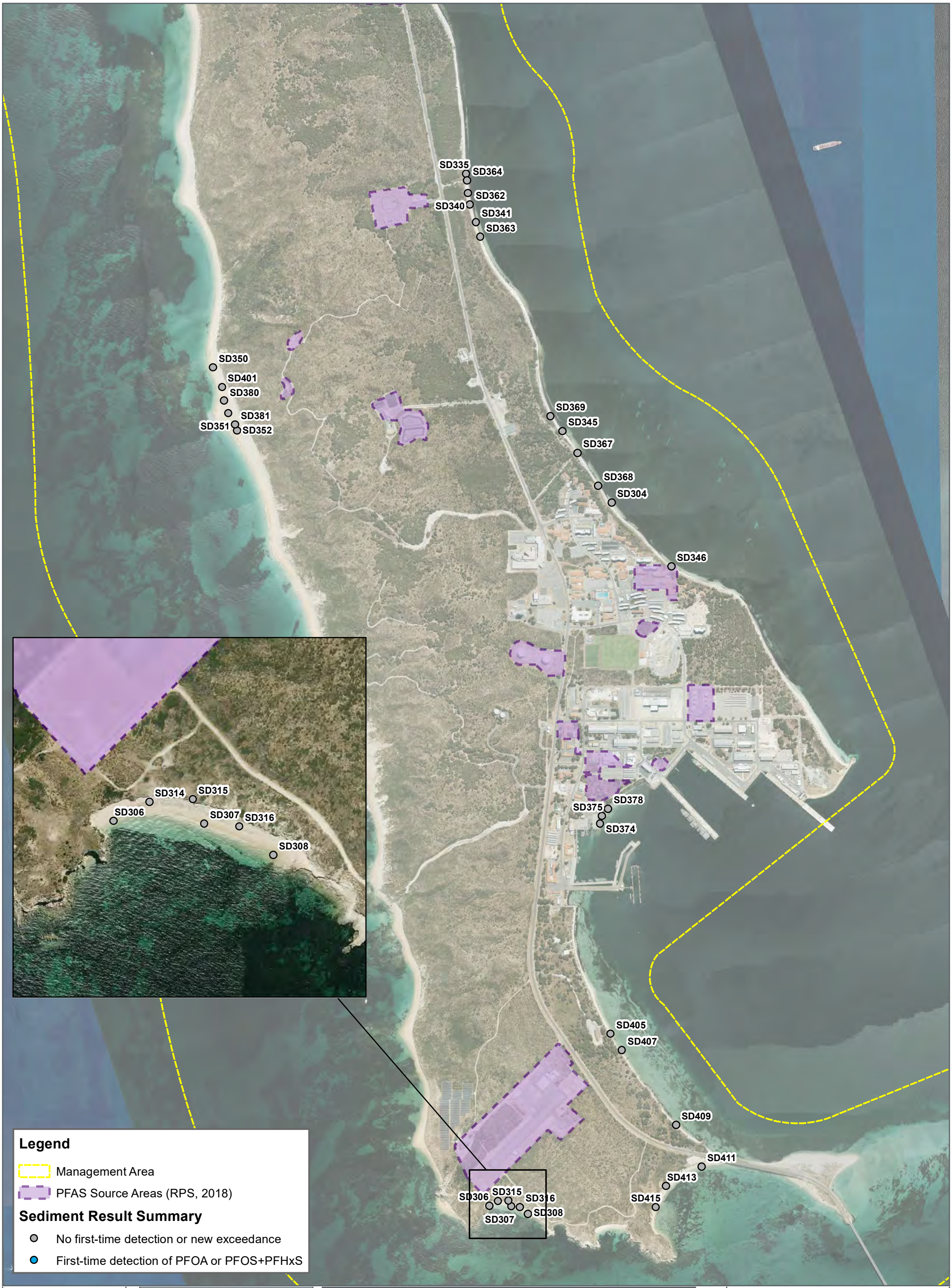

FIGURE 5A

1:15,000 Scale at A3

Metres

0 300 600

Sediment Results

Q2 2024 QUARTERLY SAMPLING EVENT
HMAS STIRLING
DEPARTMENT OF DEFENCE

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Map Produced by Cardno WA
Date: 2024-06-20 | Project: DEF19009
Coordinate System: GDA 1994 MGA Zone 50
Map: DEF19009_WA_0089-GS-005A_2024Q2_SDResultSummary_PFAS 01.mxd
Aerial Imagery Supplied by Google Earth



FIGURE 5B

1:15,000 Scale at A3

Metres

0 300 600

Sediment Results

Q2 2024 QUARTERLY SAMPLING EVENT
HMAS STIRLING
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Date: 2024-06-20 | Project: DEF19009
Coordinate System: GDA 1994 MGA Zone 50
Map: DEF19009_WA_0089-GS-005B_2024Q2_SDResultSummary_PFAS 01.mxd
Aerial Imagery Supplied by Google Earth & NearMap


MW141 (0.363)
MW142 (0.322)
MW147 (0.4)
MW139 (0.328)
MW149 (0.388)
MW142 (0.322)
MW139 (0.328)
MW124 (0.629)
MW112 (0.703)
MW125 (0.562)
MW120 (0.589)
MW121 (0.6)
MW126 (0.578)
MW123 (0.42)
MW127 (0.451)
MW158 (0.531)
MW166 (0.86)
MW172 (0.542)
MW195D (0.591)
MW171 (0.668)
MW200 (0.188)
MW193 (2.478)
MW124 (0.629)
MW125 (0.562)
MW120 (0.589)
MW127 (0.451)
MW121 (0.6)
MW158 (0.531)
MW166 (0.86)
MW200 (0.188)
MW171 (0.668)
MW193 (2.478)
MW203 (0.303)
MW288 (0.403)
MW233 (0.712)
MW236 (0.612)
MW239 (0.37)
MW249 (0.302)
MW256 (0.564)
MW255 (0.549)
MW496 (0.382)
MW259 (0.545)
MW010 (0.351)
MW268 (0.456)
MW288 (0.403)
MW289 (-0.367)
MW233 (0.712)
MW236 (0.612)
MW238 (0.387)
MW239 (0.37)
MW243 (0.422)
MW249 (0.302)
MW255 (0.549)
MW496 (0.382)
MW258 (0.538)
MW259 (0.545)
MW010 (0.351)
MW268 (0.456)
MW269 (0.403)
MW228 (0.33)
MW214 (0.66)
MW227 (0.361)
MW226 (0.549)
MW216 (0.66)
MW225 (0.446)
MW215 (0.549)
Legend
Monitoring Wells (RWL, mAHD)
Inferred groundwater contours (mAHD)
Management Area
Note: Gauging was generally conducted during outgoing tides to minimise potential tidal pressure influence
FIGURE 6
1:32,000 Scale at A3
Metres
0
500
1,000
Inferred Groundwater Contours
Q2 2024 QUARTERLY SAMPLING EVENT
HMAS STIRLING
DEPARTMENT OF DEFENCE
N
Cardno
Map Produced by Cardno WA
Date: 2024-06-20 | Project: DEF19009
Coordinate System: GDA 1994 MGA Zone 50
Map: DEF19009_WA_0089-GS-006_2024Q2_GroundwaterContours 01.mxd
Aerial Imagery Supplied by Google Earth & NearMap

APPENDIX

B

DATA ASSESSMENT TABLES

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						PFAS - Perfluoroalkyl Sulfonic Acids						PFAS - Perfluoroalkyl Carboxylic Acids								
						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)
						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 - Limit of Reporting						0.01	0.01	0.01	0.01	0.01	0.01	0.05	0.01	0.01	0.02	0.01	0.01	0.01	0.01	0.01
PFAS NEMP 2020 Drinking Water																*0.56*				
PFAS NEMP 2020 Interim Marine 99%										0.00023*						19				
PFAS NEMP 2020 Recreational Water																**10**				
Monitoring Area	**Location Code**	**Date**	**Field ID**	**Sample Type**	**Lab Report Number**															
		27 May 2024	**0089_QC301_240527**	**Rinsate**	**EP2407306**	<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
		27 May 2024	**0089_QC302_240527**	**Rinsate**	**EP2407306**	<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
		27 May 2024	**0089_QC401_240527**	**Field Blank**	**EP2407306**	<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
		27 May 2024	**0089_QC402_240527**	**Field Blank**	**EP2407306**	<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
		28 May 2024	**0089_QC301_240528**	**Rinsate**	**EP2407384**	<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
		28 May 2024	**0089_QC302_240528**	**Rinsate**	**EP2407384**	<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
		28 May 2024	**0089_QC303_240528**	**Rinsate**	**EP2407384**	<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
		28 May 2024	**0089_QC401_240528**	**Field Blank**	**EP2407384**	<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
		28 May 2024	**0089_QC402_240528**	**Field Blank**	**EP2407384**	<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
		28 May 2024	**0089_QC403_240528**	**Field Blank**	**EP2407384**	<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
		29 May 2024	**0089_QC301_240529**	**Rinsate**	**EP2407418**	<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
		29 May 2024	**0089_QC302_240529**	**Rinsate**	**EP2407455**	<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
		29 May 2024	**0089_QC303_240529**	**Rinsate**	**EP2407418**	<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
		29 May 2024	**0089_QC401_240529**	**Field Blank**	**EP2407418**	<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
		29 May 2024	**0089_QC402_240529**	**Field Blank**	**EP2407455**	<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
		29 May 2024	**0089_QC403_240529**	**Field Blank**	**EP2407418**	<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
Ship Sullage Area	**MW010**	**29 May 2024**	**0089_MW010_240529**	**Normal**	**EP2407417**	<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
FTA	**MW109**	**29 May 2024**	**0089_MW109_240529**	**Normal**	**EP2407418**	0.13	0.21	0.91	<0.02	0.09	<0.02	<0.1	<0.02	0.12	<0.02	0.01	<0.02	<0.02	<0.02	<0.02
FTA	**MW112**	**29 May 2024**	**0089_MW112_240529**	**Normal**	**EP2407418**	0.05	0.19	10.4	3.56	19.4	<0.02	<0.1	0.18	0.86	0.22	*1.77*	<0.02	<0.02	<0.02	<0.02
FTA	**MW120**	**29 May 2024**	**0089_MW120_240529**	**Normal**	**EP2407418**	0.02	0.06	1.46	0.36	3.24	<0.02	<0.1	0.02	0.10	<0.02	0.09	<0.02	<0.02	<0.02	<0.02
FTA	**MW121**	**29 May 2024**	**0089_MW121_240529**	**Normal**	**EP2407418**	0.05	0.09	1.59	0.18	19.5	<0.02	0.1	0.19	0.32	0.15	0.17	0.03	<0.02	<0.02	<0.02
FTA	**MW123**	**29 May 2024**	**0089_MW123_240529**	**Normal**	**EP2407418**	0.26	0.75	13.6	1.76	19.6	0.03	0.2	0.45	2.58	0.29	*1.14*	<0.02	<0.02	<0.02	<0.02
FTA	**MW124**	**29 May 2024**	**0089_MW124_240529**	**Normal**	**EP2407418**	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
FTA	**MW125**	**29 May 2024**	**0089_MW125_240529**	**Normal**	**EP2407418**	0.15	0.14	0.56	<0.02	<0.01	<0.02	<0.1	0.02	0.17	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02
FTA	**MW126**	**29 May 2024**	**0089_MW126_240529**	**Normal**	**EP2407418**	<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
FTA	**MW127**	**29 May 2024**	**0089_MW127_240529**	**Normal**	**EP2407418**	<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
FTA	**MW128**	**29 May 2024**	**0089_MW128_240529**	**Normal**	**EP2407418**	<0.02	<0.02	0.03	<0.02	0.64	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02
Demolition Ground	**MW139**	**28 May 2024**	**0089_MW139_240528**	**Normal**	**EP2407335**	<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
Demolition Ground	**MW139**	**28 May 2024**	**0089_QC108_240528**	**Field Duplicate**	**EP2407335**	<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
Demolition Ground	**MW139**	**28 May 2024**	**0089_QC208_240528**	**Interlab Duplicate**	**1102636**	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01
Demolition Ground	**MW141**	**28 May 2024**	**0089_MW141_240528**	**Normal**	**EP2407335**	0.21	0.36	7.66	0.81	21.5	<0.02	0.1	0.42	3.67	0.14	*0.67*	<0.02	<0.02	<0.02	<0.02
Demolition Ground	**MW142**	**28 May 2024**	**0089_MW142_240528**	**Normal**	**EP2407335**	0.08	0.13	1.74	0.05	1.31	<0.02	<0.1	0.16	1.29	0.03	0.13	<0.02	<0.02	<0.02	<0.02
Demolition Ground	**MW147**	**28 May 2024**	**0089_MW147_240528**	**Normal**	**EP2407335**	<0.02	<0.02	0.10	<0.02	0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02
Demolition Ground	**MW149**	**28 May 2024**	**0089_MW149_240528**	**Normal**	**EP2407335**	<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
WWTP	**MW158**	**27 May 2024**	**0089_MW158_240527**	**Normal**	**EP2407306**	<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
WWTP	**MW166**	**27 May 2024**	**0089_MW166_240527**	**Normal**	**EP2407306**	0.08	0.03	1.59	0.49	5.61	<0.02	0.1	0.31	0.30	0.14	0.18	0.03	<0.02	<0.02	<0.02
WWTP	**MW166**	**27 May 2024**	**0089_QC101_240527**	**Field Duplicate**	**EP2407306**	0.08	0.03	1.62	0.50	6.11	<0.02	0.1	0.31	0.30	0.14	0.18	0.04	<0.02	<0.02	<0.02
WWTP	**MW166**	**27 May 2024**	**0089_QC201_240527**	**Interlab Duplicate**	**1102636**	0.12	0.07	3.3	1.1	13	<0.01	0.15	0.52	0.50	0.24	0.30	0.06	<0.01	<0.01	<0.01
WWTP	**MW171**	**27 May 2024**	**0089_MW171_240527**	**Normal**	**EP2407306**	1.28	0.73	5.71	0.97	2.19	<0.02	0.6	0.56	1.87	0.18	0.37	<0.02	<0.02	<0.02	<0.02
WWTP	**MW172**	**27 May 2024**	**0089_MW172_240527**	**Normal**	**EP2407306**	1.43	0.97	9.33	2.21	8.89	<0.02	0.5	0.60	2.56	0.25	*0.65*	<0.02	<0.02	<0.02	<0.02
WWTP	**MW172**	**27 May 2024**	**0089_QC104_240527**	**Field Duplicate**	**EP2407306**	1.15	0.74	7.77	1.90	9.83	<0.02	0.4	0.46	1.96	0.20	0.53	<0.02	<0.02	<0.02	<0.02
WWTP	**MW172**	**27 May 2024**	**0089_QC204_240527**	**Interlab Duplicate**	**1102636**	2.0	1.8	15	3.3	20	<0.01	0.66	0.82	3.5	0.35	*1.0*	0.01	<0.01	<0.01	<0.01
WWTP	**MW173**	**27 May 2024**	**0089_MW173_240527**	**Normal**	**EP2407273**	0.07	0.04	0.78	0.18	2.39	<0.02	<0.1	0.07	0.18	0.02	0.11	<0.02	<0.02	<0.02	<0.02
WWTP	**MW193**	**27 May 2024**	**0089_MW193_240527**	**Normal**	**EP2407273**	0.73	0.90	10.4	0.81	3.78	<0.02	0.2	0.38	1.70	0.27	*0.64*	0.04	<0.02	<0.02	<0.02
WWTP	**MW193**	**27 May 2024**	**0089_QC105_240527**	**Field Duplicate**	**EP2407273**	0.75	0.94	10.9	0.81	3.63	<0.02	0.2	0.40	1.80	0.29	*0.71*	0.04	<0.02	<0.02	<0.02
WWTP	**MW193**	**27 May 2024**	**0089_QC205_240527**	**Interlab Duplicate**	**1102636**	1.2	1.8	21	1.3	6.1	<0.01	0.30	0.69	3.3	0.40	*1.6*	0.06	<0.01	<0.01	<0.01
WWTP	**MW195D**	**27 May 2024**	**0089_MW195D_240527**	**Normal**	**EP2407273**	<0.02	<0.02	0.01	<0.02	<0.01	<0.02	<0.1	0.04	0.04	0.06	<0.01	<0.02	<0.02	<0.02	<0.02
WWTP	**MW195D**	**27 May 2024**	**0089_QC102_240527**	**Field Duplicate**	**EP2407273**	<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
WWTP	**MW195D**	**27 May 2024**	**0089_QC202_240527**	**Interlab Duplicate**	**1102636**	<0.01	<0.01	0.04	<0.01	0.02	<0.01	<0.05	<0.01	<0.01	<0.05	0.01	<0.01	<0.01	<0.01	<0.01
WWTP	**MW195S**	**27 May 2024**	**0089_MW195S_240527**	**Normal**	**EP2407273**	<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
WWTP	**MW195S**	**27 May 2024**	**0089_QC103_240527**	**Field Duplicate**	**EP2407273**	<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
WWTP	**MW195S**	**27 May 2024**	**0089_QC203_240527**	**Interlab Duplicate**	**1102636**	<0.01	<0.01	0.03	<0.01	0.03	<0.01	<0.05	<0.01	<0.01	<0.05	0.01	<0.01	<0.01	<0.01	<0.01
WWTP	**MW199**	**29 May 2024**	**0089_MW199_240529**	**Normal**	**EP2407455**	<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
WWTP	**MW200**	**29 May 2024**	**0089_MW200_240529**	**Normal**	**EP2407455**	<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
WWTP	**MW202**	**29 May 2024**	**0089_MW202_240529**	**Normal**	**EP2407455**	<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
WWTP	**MW203**	**29 May 2024**	**0089_MW203_240529**	**Normal**	**EP2407455**	<0.02	<0.02	0.05	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02
HSF	**MW214**	**28 May 2024**	**0089_MW214_240528**	**Normal**	**EP2407384**	<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
HSF	**MW215**	**28 May 2024**	**0089_MW215_240528**	**Normal**	**EP2407384**	0.10	0.16	1.20	<0.02	0.02	<0.02	<0.1	0.08	0.30	0.08	0.03	<0.02	<0.02	<0.02	<0.02
HSF	**MW216**	**28 May 2024**	**0089_MW216_240528**	**Normal**	**EP2407384**	0.25	0.23	1.58	0.08	0.63	<0.02	2.0	6.44	2.95	0.35	0.18	<0.02	<0.02	<0.02	<0.02
HSF	**MW217**	**28 May 2024**	**0089_MW217_240528**	**Normal**	**EP2407384**	<0.02	0.02	0.02	<0.02	0.05	<0.02	2.6	7.88	4.46	1.11	0.31	<0.02	<0.02	<0.02	<0.02
HSF	**MW220**	**28 May 2024**	**0089_MW220_240528**	**Normal**	**EP2407384**	0.06	0.04	0.40	0.04	9.03	<0.02	0.1	0.16	0.18	0.08	0.09	0.04	<0.02	<0.02	<0.02
HSF	**MW224**	**28 May 2024**	**0089_MW224_240528**	**Normal**	**EP2407384**	<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
HSF	**MW225**	**28 May 2024**	**0089_MW225_240528**	**Normal**	**EP2407384**	<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
HSF	**MW226**	**28 May 2024**	**0089_MW226_240528**	**Normal**	**EP2407411**	<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

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B1 - Water samples analytical results

HMAS Stirling
Q2 2024

						PFAS - Perfluoroalkyl Sulfonic Acids						PFAS - Perfluoroalkyl Carboxylic Acids								
						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)
						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 - Limit of Reporting						0.01	0.01	0.01	0.01	0.01	0.01	0.05	0.01	0.01	0.02	0.01	0.01	0.01	0.01	0.01
PFAS NEMP 2020 Drinking Water																*0.56*				
PFAS NEMP 2020 Interim Marine 99%										0.00023*						19				
PFAS NEMP 2020 Recreational Water																**10**				
Monitoring Area	**Location Code**	**Date**	**Field ID**	**Sample Type**	**Lab Report Number**															
HSF	**MW227**	**28 May 2024**	**0089_MW227_240528**	**Normal**	**EP2407411**	<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
HSF	**MW228**	**28 May 2024**	**0089_MW228_240528**	**Normal**	**EP2407411**	0.28	0.22	0.52	<0.02	<0.01	<0.02	1.1	4.75	4.38	1.14	0.25	<0.02	<0.02	<0.02	<0.02
HSF	**MW228**	**28 May 2024**	**0089_QC106_240528**	**Field Duplicate**	**EP2407411**	0.32	0.25	0.57	<0.02	<0.01	<0.02	1.3	5.52	4.80	1.26	0.29	<0.02	<0.02	<0.02	<0.02
HSF	**MW228**	**28 May 2024**	**0089_QC206_240528**	**Interlab Duplicate**	**1102636**	0.32	0.24	0.55	<0.01	<0.01	<0.01	0.89	5.4	4.3	1.2	0.25	<0.01	<0.01	<0.01	<0.01
AVCAT Storage and Fuel Farm	**MW233**	**29 May 2024**	**0089_MW233_240529**	**Normal**	**EP2407455**	<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
	MW238	**29 May 2024**	**0089_MW238_240529**	**Normal**	**EP2407417**	<0.02	<0.02	0.14	<0.02	<0.01	<0.02	<0.1	<0.02	0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02
	MW239	**29 May 2024**	**0089_MW239_240529**	**Normal**	**EP2407417**	<0.02	<0.02	0.10	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02
	MW240	**29 May 2024**	**0089_MW240_240529**	**Normal**	**EP2407417**	<0.02	<0.02	0.03	<0.02	0.02	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02
	MW243	**29 May 2024**	**0089_MW243_240529**	**Normal**	**EP2407417**	<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
	MW245	**29 May 2024**	**0089_MW245_240529**	**Normal**	**EP2407417**	<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
	MW249	**29 May 2024**	**0089_MW249_240529**	**Normal**	**EP2407417**	<0.02	<0.02	0.24	<0.02	0.02	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02
Fire Station, Flammable/Hazardous Goods and Waste Storage, Ship Sullage	**MW255**	**28 May 2024**	**0089_MW255_240528**	**Normal**	**EP2407384**	0.37	0.36	8.73	<0.02	0.34	<0.02	0.2	0.21	0.79	0.17	0.05	<0.02	<0.02	<0.02	<0.02
	MW256	**28 May 2024**	**0089_MW256_240528**	**Normal**	**EP2407384**	6.66	6.74	26.8	1.23	16.8	0.03	1.3	2.69	12.0	1.29	*1.44*	0.03	<0.02	<0.02	<0.02
	MW257	**28 May 2024**	**0089_MW257_240528**	**Normal**	**EP2407384**	<0.02	<0.02	1.61	0.05	0.08	<0.02	<0.1	0.28	0.20	0.04	0.21	<0.02	<0.02	<0.02	<0.02
	MW258	**28 May 2024**	**0089_MW258_240528**	**Normal**	**EP2407384**	10.9	8.04	29.5	3.06	4.88	<0.02	2.7	4.18	15.7	1.88	*1.55*	<0.02	<0.02	<0.02	<0.02
	MW259	**28 May 2024**	**0089_MW259_240528**	**Normal**	**EP2407384**	<0.02	<0.02	0.11	<0.02	0.12	<0.02	<0.1	0.06	0.04	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02
Dredge Spoil / Careening B	**MW268**	**28 May 2024**	**0089_MW268_240528**	**Normal**	**EP2407411**	0.07	0.06	0.25	<0.02	<0.01	<0.02	<0.1	<0.02	0.03	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02
Dredge Spoil / Careening B	**MW269**	**29 May 2024**	**0089_MW269_240529**	**Normal**	**EP2407417**	0.10	0.13	0.79	<0.02	0.31	<0.02	<0.1	0.04	0.19	0.02	0.02	<0.02	<0.02	<0.02	<0.02
Accomodation Area	**MW288**	**28 May 2024**	**0089_MW288_240528**	**Normal**	**EP2407411**	<0.02	<0.02	0.07	<0.02	1.20	<0.02	<0.1	<0.02	<0.02	<0.02	0.01	<0.02	<0.02	<0.02	<0.02
Accomodation Area	**MW289**	**29 May 2024**	**0089_MW289_240529**	**Normal**	**EP2407455**	0.03	0.04	0.51	0.03	0.94	<0.02	<0.1	<0.02	0.05	<0.02	0.03	<0.02	<0.02	<0.02	<0.02
0089	**MW468**	**29 May 2024**	**0089_MW468_240529**	**Normal**	**EP2407455**	<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
AVCAT Storage and Fuel Fa	**MW496**	**29 May 2024**	**0089_MW496_240529**	**Normal**	**EP2407417**	0.06	0.07	1.07	0.07	6.76	<0.02	<0.1	0.03	0.17	0.04	0.10	<0.02	<0.02	<0.02	<0.02
FTA	**MW500**	**29 May 2024**	**0089_MW500_240529**	**Normal**	**EP2407418**	0.15	0.39	7.30	1.57	56.0	<0.02	0.1	0.17	1.12	0.16	0.54	<0.02	<0.02	<0.02	<0.02
AVCAT Storage and Fuel Fa	**MW516**	**29 May 2024**	**0089_MW516_240529**	**Normal**	**EP2407417**	<0.02	0.03	0.64	0.06	8.69	<0.02	<0.3	<0.05	0.06	<0.02	0.04	<0.02	<0.02	<0.02	<0.02
Ship Sullage Area	**MW553**	**29 May 2024**	**0089_MW553_240529**	**Normal**	**EP2407417**	<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
WWTP (East)	**PW304**	**29 May 2024**	**0089_PW304_240529**	**Normal**	**EP2407420**	<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
HSF	**PW306**	**28 May 2024**	**0089_PW306_240528**	**Normal**	**EP2407316**	<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
HSF	**PW307**	**28 May 2024**	**0089_PW307_240528**	**Normal**	**EP2407316**	<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
HSF	**PW307**	**28 May 2024**	**0089_QC111_240528**	**Field Duplicate**	**EP2407316**	<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
HSF	**PW307**	**28 May 2024**	**0089_QC211_240528**	**Interlab Duplicate**	**1102636**	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01
HSF	**PW308**	**28 May 2024**	**0089_PW308_240528**	**Normal**	**EP2407316**	<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
HSF	**PW314**	**28 May 2024**	**0089_PW314_240528**	**Normal**	**EP2407316**	<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
HSF	**PW315**	**28 May 2024**	**0089_PW315_240528**	**Normal**	**EP2407316**	<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
Demolition Ground	**PW329**	**28 May 2024**	**0089_PW329_240528**	**Normal**	**EP2407337**	<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
Demolition Ground	**PW329**	**28 May 2024**	**0089_QC115_240528**	**Field Duplicate**	**EP2407337**	<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
Demolition Ground	**PW329**	**28 May 2024**	**0089_QC215_240528**	**Interlab Duplicate**	**1102636**	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01
Demolition Ground	**PW330**	**28 May 2024**	**0089_PW330_240528**	**Normal**	**EP2407337**	<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
Demolition Ground	**PW331**	**28 May 2024**	**0089_PW331_240528**	**Normal**	**EP2407337**	<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
FTA	**PW335**	**29 May 2024**	**0089_PW335_240529**	**Normal**	**EP2407422**	<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
FTA	**PW340**	**29 May 2024**	**0089_PW340_240529**	**Normal**	**EP2407422**	<0.02	<0.02	<0.01	<0.02	0.04	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02
FTA	**PW341**	**29 May 2024**	**0089_PW341_240529**	**Normal**	**EP2407422**	<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
WWTP (East)	**PW345**	**29 May 2024**	**0089_PW345_240529**	**Normal**	**EP2407420**	<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
Accomodation Area	**PW346**	**28 May 2024**	**0089_PW346_240528**	**Normal**	**EP2407413**	<0.02	<0.02	0.03	<0.02	0.19	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02
WWTP (West)	**PW350**	**27 May 2024**	**0089_PW350_240527**	**Normal**	**EP2407275**	<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
WWTP (West)	**PW352**	**27 May 2024**	**0089_PW352_240527**	**Normal**	**EP2407275**	<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
Demolition Ground	**PW356**	**28 May 2024**	**0089_PW356_240528**	**Normal**	**EP2407337**	<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
Demolition Ground	**PW356**	**28 May 2024**	**0089_QC114_240528**	**Field Duplicate**	**EP2407337**	<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
Demolition Ground	**PW356**	**28 May 2024**	**0089_QC214_240528**	**Interlab Duplicate**	**1102636**	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01
Demolition Ground	**PW357**	**28 May 2024**	**0089_PW357_240528**	**Normal**	**EP2407337**	<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
Demolition Ground	**PW358**	**28 May 2024**	**0089_PW358_240528**	**Normal**	**EP2407337**	<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

							PFAS - Perfluoroalkyl Sulfonic Acids						PFAS - Perfluoroalkyl Carboxylic Acids								
							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)
							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 - Limit of Reporting							0.01	0.01	0.01	0.01	0.01	0.01	0.05	0.01	0.01	0.02	0.01	0.01	0.01	0.01	0.01
PFAS NEMP 2020 Drinking Water																	*0.56*				
PFAS NEMP 2020 Interim Marine 99%											0.00023*						19				
PFAS NEMP 2020 Recreational Water																	**10**				
Monitoring Area	**Location Code**	**Date**	**Field ID**	**Sample Type**	**Lab Report Number**																
FTA	**PW362**	**29 May 2024**	**0089_PW362_240529**	**Normal**	**EP2407422**		<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
FTA	**PW363**	**29 May 2024**	**0089_PW363_240529**	**Normal**	**EP2407422**		<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
FTA	**PW364**	**29 May 2024**	**0089_PW364_240529**	**Normal**	**EP2407422**		<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
WWTP (East)	**PW367**	**29 May 2024**	**0089_PW367_240529**	**Normal**	**EP2407420**		<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
WWTP (East)	**PW368**	**29 May 2024**	**0089_PW368_240529**	**Normal**	**EP2407420**		<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
WWTP (East)	**PW369**	**29 May 2024**	**0089_PW369_240529**	**Normal**	**EP2407420**		<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
Dredge Spoil / Careening B	**PW374**	**28 May 2024**	**0089_PW374_240528**	**Normal**	**EP2407413**		<0.02	<0.02	<0.01	<0.02	0.82	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02
Dredge Spoil / Careening B	**PW375**	**28 May 2024**	**0089_PW375_240528**	**Normal**	**EP2407413**		<0.02	<0.02	<0.01	<0.02	0.68	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02
Dredge Spoil / Careening B	**PW378**	**28 May 2024**	**0089_PW378_240528**	**Normal**	**EP2407413**		<0.02	<0.02	<0.01	<0.02	0.10	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02
WWTP (West)	**PW380**	**27 May 2024**	**0089_PW380_240527**	**Normal**	**EP2407275**		<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
WWTP (West)	**PW381**	**27 May 2024**	**0089_PW381_240527**	**Normal**	**EP2407275**		<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
WWTP (West)	**PW401**	**27 May 2024**	**0089_PW401_240527**	**Normal**	**EP2407275**		<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
HSF	**PW405**	**28 May 2024**	**0089_PW405_240528**	**Normal**	**EP2407413**		<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
HSF	**PW407**	**28 May 2024**	**0089_PW407_240528**	**Normal**	**EP2407413**		<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
HSF	**PW409**	**28 May 2024**	**0089_PW409_240528**	**Normal**	**EP2407413**		<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
HSF	**PW411**	**28 May 2024**	**0089_PW411_240528**	**Normal**	**EP2407316**		<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
HSF	**PW411**	**28 May 2024**	**0089_QC116_240528**	**Field Duplicate**	**EP2407316**		<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
HSF	**PW411**	**28 May 2024**	**0089_QC216_240528**	**Interlab Duplicate**	**1102636**		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01
HSF	**PW413**	**28 May 2024**	**0089_PW413_240528**	**Normal**	**EP2407316**		<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
HSF	**PW415**	**28 May 2024**	**0089_PW415_240528**	**Normal**	**EP2407316**		<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
FTA	**SW130**	**29 May 2024**	**0089_SW130_240529**	**Normal**	**EP2407422**		<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
FTA	**SW132**	**29 May 2024**	**0089_SW132_240529**	**Normal**	**EP2407422**		<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
FTA	**SW134**	**29 May 2024**	**0089_SW134_240529**	**Normal**	**EP2407422**		<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
Demolition Ground	**SW150**	**28 May 2024**	**0089_QC112_240528**	**Field Duplicate**	**EP2407337**		<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
Demolition Ground	**SW150**	**28 May 2024**	**0089_QC212_240528**	**Interlab Duplicate**	**1102636**		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01
Demolition Ground	**SW150**	**28 May 2024**	**0089_SW150_240528**	**Normal**	**EP2407337**		<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
Demolition Ground	**SW152**	**28 May 2024**	**0089_SW152_240528**	**Normal**	**EP2407337**		<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
Demolition Ground	**SW154**	**28 May 2024**	**0089_SW154_240528**	**Normal**	**EP2407337**		<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
Demolition Ground	**SW156**	**28 May 2024**	**0089_QC113_240528**	**Field Duplicate**	**EP2407337**		<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
Demolition Ground	**SW156**	**28 May 2024**	**0089_QC213_240528**	**Interlab Duplicate**	**1102636**		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01
Demolition Ground	**SW156**	**28 May 2024**	**0089_SW156_240528**	**Normal**	**EP2407337**		<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
WWTP (East)	**SW305**	**29 May 2024**	**0089_SW305_240529**	**Normal**	**EP2407420**		<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
HSF	**SW309**	**28 May 2024**	**0089_SW309_240528**	**Normal**	**EP2407316**		<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
HSF	**SW310**	**28 May 2024**	**0089_SW310_240528**	**Normal**	**EP2407316**		<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
HSF	**SW311**	**28 May 2024**	**0089_SW311_240528**	**Normal**	**EP2407316**		<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
Dredge Spoil / Careening B	**SW317**	**28 May 2024**	**0089_SW317_240528**	**Normal**	**EP2407413**		<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
Dredge Spoil / Careening B	**SW318**	**28 May 2024**	**0089_SW318_240528**	**Normal**	**EP2407413**		<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
Dredge Spoil / Careening B	**SW319**	**28 May 2024**	**0089_SW319_240528**	**Normal**	**EP2407413**		<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
WWTP (West)	**SW353**	**27 May 2024**	**0089_SW353_240527**	**Normal**	**EP2407272**		<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
WWTP (East)	**SW370**	**29 May 2024**	**0089_SW370_240529**	**Normal**	**EP2407420**		<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
WWTP (East)	**SW371**	**29 May 2024**	**0089_SW371_240529**	**Normal**	**EP2407420**		<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
WWTP (East)	**SW372**	**28 May 2024**	**0089_SW372_240528**	**Normal**	**EP2407413**		<0.02	<0.02	<0.01	<0.02	0.04	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02
WWTP (West)	**SW373**	**28 May 2024**	**0089_SW373_240528**	**Normal**	**EP2407413**		<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
WWTP (West)	**SW382**	**27 May 2024**	**0089_SW382_240527**	**Normal**	**EP2407272**		<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
WWTP (West)	**SW383**	**27 May 2024**	**0089_SW383_240527**	**Normal**	**EP2407272**		<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
WWTP (West)	**SW384**	**27 May 2024**	**0089_SW384_240527**	**Normal**	**EP2407272**		<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
HSF	**SW406**	**28 May 2024**	**0089_SW406_240528**	**Normal**	**EP2407413**		<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
HSF	**SW408**	**28 May 2024**	**0089_QC109_240528**	**Field Duplicate**	**EP2407413**		<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
HSF	**SW408**	**28 May 2024**	**0089_QC209_240528**	**Interlab Duplicate**	**1102636**		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01
HSF	**SW408**	**28 May 2024**	**0089_SW408_240528**	**Normal**	**EP2407413**		<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
HSF	**SW410**	**28 May 2024**	**0089_SW410_240528**	**Normal**	**EP2407413**		<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
HSF	**SW412**	**28 May 2024**	**0089_SW412_240528**	**Normal**	**EP2407316**		<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
HSF	**SW414**	**28 May 2024**	**0089_SW414_240528**	**Normal**	**EP2407316**		<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
HSF	**SW416**	**28 May 2024**	**0089_SW416_240528**	**Normal**	**EP2407316**		<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

Environmental Standards

HEPA, January 2020, PFAS NEMP 2020 Drinking Water

HEPA, January 2020, PFAS NEMP 2020 Interim Marine 99%

HEPA, January 2020, PFAS NEMP 2020 Recreational Water

Env Stds Comments

*Practical screening guideline of 0.01 µg/L adopted base on typical current laboratory limit of reporting.

Notes:

First-time detection of PFOA or PFOS+PFHxS

New exceedance of guideline value

							PFAS - (n:2) Fluorotelomer Sulfonic Acids				PFAS - Perfluoroalkyl Sulfonamides							PFAS		
						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 (WA DER List)	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
LOR - Limit of Reporting						0.01	0.01	0.01	0.05	0.01	0.01	0.02	0.05	0.02	0.05	0.05	0.02	0.05	0.01	0.01	0.01
PFAS NEMP 2020 Drinking Water																			*0.07*		
PFAS NEMP 2020 Interim Marine 99%																					
PFAS NEMP 2020 Recreational Water																			**2**		
Monitoring Area	**Location Code**	**Date**	**Field ID**	**Sample Type**	**Lab Report Number**																
		27 May 2024	**0089_QC301_240527**	**Rinsate**	**EP2407306**	<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	<0.01
		27 May 2024	**0089_QC302_240527**	**Rinsate**	**EP2407306**	<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	<0.01
		27 May 2024	**0089_QC401_240527**	**Field Blank**	**EP2407306**	<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	<0.01
		27 May 2024	**0089_QC402_240527**	**Field Blank**	**EP2407306**	<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	<0.01
		28 May 2024	**0089_QC301_240528**	**Rinsate**	**EP2407384**	<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	<0.01
		28 May 2024	**0089_QC302_240528**	**Rinsate**	**EP2407384**	<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	<0.01
		28 May 2024	**0089_QC303_240528**	**Rinsate**	**EP2407384**	<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	<0.01
		28 May 2024	**0089_QC401_240528**	**Field Blank**	**EP2407384**	<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	<0.01
		28 May 2024	**0089_QC402_240528**	**Field Blank**	**EP2407384**	<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	<0.01
		28 May 2024	**0089_QC403_240528**	**Field Blank**	**EP2407384**	<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	<0.01
		29 May 2024	**0089_QC301_240529**	**Rinsate**	**EP2407418**	<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	<0.01
		29 May 2024	**0089_QC302_240529**	**Rinsate**	**EP2407455**	<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	<0.01
		29 May 2024	**0089_QC303_240529**	**Rinsate**	**EP2407418**	<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	<0.01
		29 May 2024	**0089_QC401_240529**	**Field Blank**	**EP2407418**	<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	<0.01
		29 May 2024	**0089_QC402_240529**	**Field Blank**	**EP2407455**	<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	<0.01
		29 May 2024	**0089_QC403_240529**	**Field Blank**	**EP2407418**	<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	<0.01
Ship Sullage Area	**MW010**	**29 May 2024**	**0089_MW010_240529**	**Normal**	**EP2407417**	<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	0.02
FTA	**MW109**	**29 May 2024**	**0089_MW109_240529**	**Normal**	**EP2407418**	<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	*1.00*	1.26	1.47
FTA	**MW112**	**29 May 2024**	**0089_MW112_240529**	**Normal**	**EP2407418**	<0.02	<0.05	<0.05	0.09	<0.05	<0.05	0.22	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***29.8***	33.0	37.0
FTA	**MW120**	**29 May 2024**	**0089_MW120_240529**	**Normal**	**EP2407418**	<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	***4.70***	4.93	5.35
FTA	**MW121**	**29 May 2024**	**0089_MW121_240529**	**Normal**	**EP2407418**	<0.02	<0.05	<0.05	0.12	<0.05	<0.05	0.06	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***21.1***	22.2	22.7
FTA	**MW123**	**29 May 2024**	**0089_MW123_240529**	**Normal**	**EP2407418**	<0.02	<0.05	<0.05	0.22	0.06	<0.05	0.21	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***33.2***	38.4	41.5
FTA	**MW124**	**29 May 2024**	**0089_MW124_240529**	**Normal**	**EP2407418**	<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	0.02	0.02
FTA	**MW125**	**29 May 2024**	**0089_MW125_240529**	**Normal**	**EP2407418**	<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	*0.56*	0.90	1.04
FTA	**MW126**	**29 May 2024**	**0089_MW126_240529**	**Normal**	**EP2407418**	<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	<0.01
FTA	**MW127**	**29 May 2024**	**0089_MW127_240529**	**Normal**	**EP2407418**	<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	<0.01
FTA	**MW128**	**29 May 2024**	**0089_MW128_240529**	**Normal**	**EP2407418**	<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*	0.67	0.67
Demolition Ground	**MW139**	**28 May 2024**	**0089_MW139_240528**	**Normal**	**EP2407335**	<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	<0.01
Demolition Ground	**MW139**	**28 May 2024**	**0089_QC108_240528**	**Field Duplicate**	**EP2407335**	<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	<0.01
Demolition Ground	**MW139**	**28 May 2024**	**0089_QC208_240528**	**Interlab Duplicate**	**1102636**	<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	<0.01	<0.05	<0.1
Demolition Ground	**MW141**	**28 May 2024**	**0089_MW141_240528**	**Normal**	**EP2407335**	<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	***29.2***	34.4	35.6
Demolition Ground	**MW142**	**28 May 2024**	**0089_MW142_240528**	**Normal**	**EP2407335**	<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	***3.05***	4.74	4.92
Demolition Ground	**MW147**	**28 May 2024**	**0089_MW147_240528**	**Normal**	**EP2407335**	<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*	0.11	0.11
Demolition Ground	**MW149**	**28 May 2024**	**0089_MW149_240528**	**Normal**	**EP2407335**	<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	<0.01
WWTP	**MW158**	**27 May 2024**	**0089_MW158_240527**	**Normal**	**EP2407306**	<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	<0.01
WWTP	**MW166**	**27 May 2024**	**0089_MW166_240527**	**Normal**	**EP2407306**	<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	***7.20***	8.37	8.92
WWTP	**MW166**	**27 May 2024**	**0089_QC101_240527**	**Field Duplicate**	**EP2407306**	<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	***7.73***	8.90	9.47
WWTP	**MW166**	**27 May 2024**	**0089_QC201_240527**	**Interlab Duplicate**	**1102636**	<0.01	<0.01	<0.01	0.12	<0.01	<0.01	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	***16.3***	18.25	19.52
WWTP	**MW171**	**27 May 2024**	**0089_MW171_240527**	**Normal**	**EP2407306**	<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	***7.90***	12.8	14.5
WWTP	**MW172**	**27 May 2024**	**0089_MW172_240527**	**Normal**	**EP2407306**	<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	***18.2***	24.2	27.4
WWTP	**MW172**	**27 May 2024**	**0089_QC104_240527**	**Field Duplicate**	**EP2407306**	<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	***17.6***	22.3	24.9
WWTP	**MW172**	**27 May 2024**	**0089_QC204_240527**	**Interlab Duplicate**	**1102636**	<0.01	<0.01	<0.01	0.07	<0.01	<0.01	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	***35***	43.4	50.11
WWTP	**MW173**	**27 May 2024**	**0089_MW173_240527**	**Normal**	**EP2407273**	<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	***3.17***	3.62	3.84
WWTP	**MW193**	**27 May 2024**	**0089_MW193_240527**	**Normal**	**EP2407273**	<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	***14.2***	18.1	19.8
WWTP	**MW193**	**27 May 2024**	**0089_QC105_240527**	**Field Duplicate**	**EP2407273**	<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	***14.5***	18.7	20.5
WWTP	**MW193**	**27 May 2024**	**0089_QC205_240527**	**Interlab Duplicate**	**1102636**	<0.01	<0.01	<0.01	0.23	<0.01	<0.01	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	***27.1***	34.82	38.55
WWTP	**MW195D**	**27 May 2024**	**0089_MW195D_240527**	**Normal**	**EP2407273**	<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	0.15	0.15
WWTP	**MW195D**	**27 May 2024**	**0089_QC102_240527**	**Field Duplicate**	**EP2407273**	<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	0.02
WWTP	**MW195D**	**27 May 2024**	**0089_QC202_240527**	**Interlab Duplicate**	**1102636**	<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	0.06	0.07	<0.1
WWTP	**MW195S**	**27 May 2024**	**0089_MW195S_240527**	**Normal**	**EP2407273**	<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	<0.01
WWTP	**MW195S**	**27 May 2024**	**0089_QC103_240527**	**Field Duplicate**	**EP2407273**	<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	<0.01
WWTP	**MW195S**	**27 May 2024**	**0089_QC203_240527**	**Interlab Duplicate**	**1102636**	<0.01	<0.01	<0.01	0.14	<0.01	<0.01	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.06	0.21	0.21
WWTP	**MW199**	**29 May 2024**	**0089_MW199_240529**	**Normal**	**EP2407455**	<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	0.02
WWTP	**MW200**	**29 May 2024**	**0089_MW200_240529**	**Normal**	**EP2407455**	<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	<0.01
WWTP	**MW202**	**29 May 2024**	**0089_MW202_240529**	**Normal**	**EP2407455**	<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	0.02
WWTP	**MW203**	**29 May 2024**	**0089_MW203_240529**	**Normal**	**EP2407455**	<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	0.05
HSF	**MW214**	**28 May 2024**	**0089_MW214_240528**	**Normal**	**EP2407384**	<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	<0.01
HSF	**MW215**	**28 May 2024**	**0089_MW215_240528**	**Normal**	**EP2407384**	<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	*1.22*	1.81	2.00
HSF	**MW216**	**28 May 2024**	**0089_MW216_240528**	**Normal**	**EP2407384**	<0.02	<0.05	<0.05	2.01	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***2.21***	16.4	16.7
HSF	**MW217**	**28 May 2024**	**0089_MW217_240528**	**Normal**	**EP2407384**	<0.02	<0.05	<0.05	19.7	0.30	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.07	36.4	36.4
HSF	**MW220**	**28 May 2024**	**0089_MW220_240528**	**Normal**	**EP2407384**	<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	***9.43***	10.1	10.2
HSF	**MW224**	**28 May 2024**	**0089_MW224_240528**	**Normal**	**EP2407384**	<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	0.01
HSF	**MW225**	**28 May 2024**	**0089_MW225_240528**	**Normal**	**EP2407384**	<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	<0.01
HSF	**MW226**	**28 May 2024**	**0089_MW226_240528**	**Normal**	**EP2407411**	<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	<0.01

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B1 - Water samples analytical results

HMAS Stirling
Q2 2024

						PFAS - (n:2) Fluorotelomer Sulfonic Acids						PFAS - Perfluoroalkyl Sulfonamides							PFAS		
						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 (WA DER List)	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
LOR - Limit of Reporting						0.01	0.01	0.01	0.05	0.01	0.01	0.02	0.05	0.02	0.05	0.05	0.02	0.05	0.01	0.01	0.01
PFAS NEMP 2020 Drinking Water																			*0.07*		
PFAS NEMP 2020 Interim Marine 99%																					
PFAS NEMP 2020 Recreational Water																			**2**		
Monitoring Area	**Location Code**	**Date**	**Field ID**	**Sample Type**	**Lab Report Number**																
HSF	**MW227**	**28 May 2024**	**0089_MW227_240528**	**Normal**	**EP2407411**	<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	<0.01
HSF	**MW228**	**28 May 2024**	**0089_MW228_240528**	**Normal**	**EP2407411**	<0.02	<0.05	<0.05	0.59	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	*0.52*	13.0	13.2
HSF	**MW228**	**28 May 2024**	**0089_QC106_240528**	**Field Duplicate**	**EP2407411**	<0.02	<0.05	<0.05	0.72	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	*0.57*	14.8	15.0
HSF	**MW228**	**28 May 2024**	**0089_QC206_240528**	**Interlab Duplicate**	**1102636**	<0.01	<0.01	<0.01	0.76	<0.01	<0.01	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	*0.55*	13.67	14.02
AVCAT Storage and Fuel Farm	**MW233**	**29 May 2024**	**0089_MW233_240529**	**Normal**	**EP2407455**	<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	0.04
	MW238	**29 May 2024**	**0089_MW238_240529**	**Normal**	**EP2407417**	<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*	0.16	0.16
	MW239	**29 May 2024**	**0089_MW239_240529**	**Normal**	**EP2407417**	<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	0.10
	MW240	**29 May 2024**	**0089_MW240_240529**	**Normal**	**EP2407417**	<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	0.05
	MW243	**29 May 2024**	**0089_MW243_240529**	**Normal**	**EP2407417**	<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	<0.01
	MW245	**29 May 2024**	**0089_MW245_240529**	**Normal**	**EP2407417**	<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	<0.01
	MW249	**29 May 2024**	**0089_MW249_240529**	**Normal**	**EP2407417**	<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	*0.26*	0.26	0.26
Fire Station, Flammable/Hazardous Goods and Waste Storage, Ship Sullage	**MW255**	**28 May 2024**	**0089_MW255_240528**	**Normal**	**EP2407384**	<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	***9.07***	10.9	11.4
	MW256	**28 May 2024**	**0089_MW256_240528**	**Normal**	**EP2407384**	<0.02	<0.05	<0.05	0.71	<0.05	<0.05	0.06	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***43.6***	69.7	78.1
	MW257	**28 May 2024**	**0089_MW257_240528**	**Normal**	**EP2407384**	<0.02	<0.05	<0.05	0.11	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	*1.69*	2.53	2.58
	MW258	**28 May 2024**	**0089_MW258_240528**	**Normal**	**EP2407384**	<0.02	<0.05	<0.05	0.12	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	***34.4***	71.4	82.5
	MW259	**28 May 2024**	**0089_MW259_240528**	**Normal**	**EP2407384**	<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	*0.23*	0.33	0.33
Dredge Spoil / Careening B	**MW268**	**28 May 2024**	**0089_MW268_240528**	**Normal**	**EP2407411**	<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*	0.35	0.41
Dredge Spoil / Careening B	**MW269**	**29 May 2024**	**0089_MW269_240529**	**Normal**	**EP2407417**	<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	*1.10*	1.47	1.60
Accomodation Area	**MW288**	**28 May 2024**	**0089_MW288_240528**	**Normal**	**EP2407411**	<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	*1.27*	1.28	1.28
Accomodation Area	**MW289**	**29 May 2024**	**0089_MW289_240529**	**Normal**	**EP2407455**	<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	*1.45*	1.56	1.63
0089	**MW468**	**29 May 2024**	**0089_MW468_240529**	**Normal**	**EP2407455**	<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	<0.01
AVCAT Storage and Fuel Fa	**MW496**	**29 May 2024**	**0089_MW496_240529**	**Normal**	**EP2407417**	<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	***7.83***	8.23	8.62
FTA	**MW500**	**29 May 2024**	**0089_MW500_240529**	**Normal**	**EP2407418**	<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	***63.3***	65.5	67.7
AVCAT Storage and Fuel Fa	**MW516**	**29 May 2024**	**0089_MW516_240529**	**Normal**	**EP2407417**	<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	***9.33***	9.43	9.54
Ship Sullage Area	**MW553**	**29 May 2024**	**0089_MW553_240529**	**Normal**	**EP2407417**	<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	0.01
WWTP (East)	**PW304**	**29 May 2024**	**0089_PW304_240529**	**Normal**	**EP2407420**	<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	0.06
HSF	**PW306**	**28 May 2024**	**0089_PW306_240528**	**Normal**	**EP2407316**	<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	<0.01
HSF	**PW307**	**28 May 2024**	**0089_PW307_240528**	**Normal**	**EP2407316**	<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	0.01
HSF	**PW307**	**28 May 2024**	**0089_QC111_240528**	**Field Duplicate**	**EP2407316**	<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	<0.01
HSF	**PW307**	**28 May 2024**	**0089_QC211_240528**	**Interlab Duplicate**	**1102636**	<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	<0.01	<0.05	<0.1
HSF	**PW308**	**28 May 2024**	**0089_PW308_240528**	**Normal**	**EP2407316**	<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	<0.01
HSF	**PW314**	**28 May 2024**	**0089_PW314_240528**	**Normal**	**EP2407316**	<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	<0.01
HSF	**PW315**	**28 May 2024**	**0089_PW315_240528**	**Normal**	**EP2407316**	<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	<0.01
Demolition Ground	**PW329**	**28 May 2024**	**0089_PW329_240528**	**Normal**	**EP2407337**	<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	<0.01
Demolition Ground	**PW329**	**28 May 2024**	**0089_QC115_240528**	**Field Duplicate**	**EP2407337**	<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	<0.01
Demolition Ground	**PW329**	**28 May 2024**	**0089_QC215_240528**	**Interlab Duplicate**	**1102636**	<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	<0.01	<0.05	<0.1
Demolition Ground	**PW330**	**28 May 2024**	**0089_PW330_240528**	**Normal**	**EP2407337**	<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	<0.01
Demolition Ground	**PW331**	**28 May 2024**	**0089_PW331_240528**	**Normal**	**EP2407337**	<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	<0.01
FTA	**PW335**	**29 May 2024**	**0089_PW335_240529**	**Normal**	**EP2407422**	<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	<0.01
FTA	**PW340**	**29 May 2024**	**0089_PW340_240529**	**Normal**	**EP2407422**	<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	0.04
FTA	**PW341**	**29 May 2024**	**0089_PW341_240529**	**Normal**	**EP2407422**	<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	<0.01
WWTP (East)	**PW345**	**29 May 2024**	**0089_PW345_240529**	**Normal**	**EP2407420**	<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	<0.01
Accomodation Area	**PW346**	**28 May 2024**	**0089_PW346_240528**	**Normal**	**EP2407413**	<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*	0.22	0.22
WWTP (West)	**PW350**	**27 May 2024**	**0089_PW350_240527**	**Normal**	**EP2407275**	<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	<0.01
WWTP (West)	**PW352**	**27 May 2024**	**0089_PW352_240527**	**Normal**	**EP2407275**	<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	<0.01
Demolition Ground	**PW356**	**28 May 2024**	**0089_PW356_240528**	**Normal**	**EP2407337**	<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	0.02
Demolition Ground	**PW356**	**28 May 2024**	**0089_QC114_240528**	**Field Duplicate**	**EP2407337**	<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	0.02
Demolition Ground	**PW356**	**28 May 2024**	**0089_QC214_240528**	**Interlab Duplicate**	**1102636**	<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	<0.01	<0.05	<0.1
Demolition Ground	**PW357**	**28 May 2024**	**0089_PW357_240528**	**Normal**	**EP2407337**	<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	<0.01
Demolition Ground	**PW358**	**28 May 2024**	**0089_PW358_240528**	**Normal**	**EP2407337**	<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	<0.01

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B1 - Water samples analytical results

HMAS Stirling
Q2 2024

						PFAS - (n:2) Fluorotelomer Sulfonic Acids						PFAS - Perfluoroalkyl Sulfonamides							PFAS		
						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 (WA DER List)	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
LOR - Limit of Reporting						0.01	0.01	0.01	0.05	0.01	0.01	0.02	0.05	0.02	0.05	0.05	0.02	0.05	0.01	0.01	0.01
PFAS NEMP 2020 Drinking Water																			*0.07*		
PFAS NEMP 2020 Interim Marine 99%																					
PFAS NEMP 2020 Recreational Water																			**2**		
Monitoring Area	**Location Code**	**Date**	**Field ID**	**Sample Type**	**Lab Report Number**																
FTA	**PW362**	**29 May 2024**	**0089_PW362_240529**	**Normal**	**EP2407422**	<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	<0.01
FTA	**PW363**	**29 May 2024**	**0089_PW363_240529**	**Normal**	**EP2407422**	<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	0.03
FTA	**PW364**	**29 May 2024**	**0089_PW364_240529**	**Normal**	**EP2407422**	<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	0.02
WWTP (East)	**PW367**	**29 May 2024**	**0089_PW367_240529**	**Normal**	**EP2407420**	<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	<0.01
WWTP (East)	**PW368**	**29 May 2024**	**0089_PW368_240529**	**Normal**	**EP2407420**	<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	0.03
WWTP (East)	**PW369**	**29 May 2024**	**0089_PW369_240529**	**Normal**	**EP2407420**	<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	0.03
Dredge Spoil / Careening B	**PW374**	**28 May 2024**	**0089_PW374_240528**	**Normal**	**EP2407413**	<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	*0.82*	0.82	0.82
Dredge Spoil / Careening B	**PW375**	**28 May 2024**	**0089_PW375_240528**	**Normal**	**EP2407413**	<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	*0.68*	0.68	0.72
Dredge Spoil / Careening B	**PW378**	**28 May 2024**	**0089_PW378_240528**	**Normal**	**EP2407413**	<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	0.10
WWTP (West)	**PW380**	**27 May 2024**	**0089_PW380_240527**	**Normal**	**EP2407275**	<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	<0.01
WWTP (West)	**PW381**	**27 May 2024**	**0089_PW381_240527**	**Normal**	**EP2407275**	<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	<0.01
WWTP (West)	**PW401**	**27 May 2024**	**0089_PW401_240527**	**Normal**	**EP2407275**	<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	<0.01
HSF	**PW405**	**28 May 2024**	**0089_PW405_240528**	**Normal**	**EP2407413**	<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	<0.01
HSF	**PW407**	**28 May 2024**	**0089_PW407_240528**	**Normal**	**EP2407413**	<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	<0.01
HSF	**PW409**	**28 May 2024**	**0089_PW409_240528**	**Normal**	**EP2407413**	<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	0.01
HSF	**PW411**	**28 May 2024**	**0089_PW411_240528**	**Normal**	**EP2407316**	<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	<0.01
HSF	**PW411**	**28 May 2024**	**0089_QC116_240528**	**Field Duplicate**	**EP2407316**	<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	<0.01
HSF	**PW411**	**28 May 2024**	**0089_QC216_240528**	**Interlab Duplicate**	**1102636**	<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	<0.01	<0.05	<0.1
HSF	**PW413**	**28 May 2024**	**0089_PW413_240528**	**Normal**	**EP2407316**	<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	<0.01
HSF	**PW415**	**28 May 2024**	**0089_PW415_240528**	**Normal**	**EP2407316**	<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	<0.01
FTA	**SW130**	**29 May 2024**	**0089_SW130_240529**	**Normal**	**EP2407422**	<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	<0.01
FTA	**SW132**	**29 May 2024**	**0089_SW132_240529**	**Normal**	**EP2407422**	<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	<0.01
FTA	**SW134**	**29 May 2024**	**0089_SW134_240529**	**Normal**	**EP2407422**	<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	<0.01
Demolition Ground	**SW150**	**28 May 2024**	**0089_QC112_240528**	**Field Duplicate**	**EP2407337**	<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	<0.01
Demolition Ground	**SW150**	**28 May 2024**	**0089_QC212_240528**	**Interlab Duplicate**	**1102636**	<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	<0.01	<0.05	<0.1
Demolition Ground	**SW150**	**28 May 2024**	**0089_SW150_240528**	**Normal**	**EP2407337**	<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	<0.01
Demolition Ground	**SW152**	**28 May 2024**	**0089_SW152_240528**	**Normal**	**EP2407337**	<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	<0.01
Demolition Ground	**SW154**	**28 May 2024**	**0089_SW154_240528**	**Normal**	**EP2407337**	<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	<0.01
Demolition Ground	**SW156**	**28 May 2024**	**0089_QC113_240528**	**Field Duplicate**	**EP2407337**	<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	<0.01
Demolition Ground	**SW156**	**28 May 2024**	**0089_QC213_240528**	**Interlab Duplicate**	**1102636**	<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	<0.01	<0.05	<0.1
Demolition Ground	**SW156**	**28 May 2024**	**0089_SW156_240528**	**Normal**	**EP2407337**	<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	<0.01
WWTP (East)	**SW305**	**29 May 2024**	**0089_SW305_240529**	**Normal**	**EP2407420**	<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	<0.01
HSF	**SW309**	**28 May 2024**	**0089_SW309_240528**	**Normal**	**EP2407316**	<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	<0.01
HSF	**SW310**	**28 May 2024**	**0089_SW310_240528**	**Normal**	**EP2407316**	<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	<0.01
HSF	**SW311**	**28 May 2024**	**0089_SW311_240528**	**Normal**	**EP2407316**	<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	<0.01
Dredge Spoil / Careening B	**SW317**	**28 May 2024**	**0089_SW317_240528**	**Normal**	**EP2407413**	<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	<0.01
Dredge Spoil / Careening B	**SW318**	**28 May 2024**	**0089_SW318_240528**	**Normal**	**EP2407413**	<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	0.02
Dredge Spoil / Careening B	**SW319**	**28 May 2024**	**0089_SW319_240528**	**Normal**	**EP2407413**	<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	<0.01
WWTP (West)	**SW353**	**27 May 2024**	**0089_SW353_240527**	**Normal**	**EP2407272**	<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	<0.01
WWTP (East)	**SW370**	**29 May 2024**	**0089_SW370_240529**	**Normal**	**EP2407420**	<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	0.01
WWTP (East)	**SW371**	**29 May 2024**	**0089_SW371_240529**	**Normal**	**EP2407420**	<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	0.01
WWTP (East)	**SW372**	**28 May 2024**	**0089_SW372_240528**	**Normal**	**EP2407413**	<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	0.04
WWTP (West)	**SW373**	**28 May 2024**	**0089_SW373_240528**	**Normal**	**EP2407413**	<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	0.06
WWTP (West)	**SW382**	**27 May 2024**	**0089_SW382_240527**	**Normal**	**EP2407272**	<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	<0.01
WWTP (West)	**SW383**	**27 May 2024**	**0089_SW383_240527**	**Normal**	**EP2407272**	<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	<0.01
WWTP (West)	**SW384**	**27 May 2024**	**0089_SW384_240527**	**Normal**	**EP2407272**	<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	<0.01
HSF	**SW406**	**28 May 2024**	**0089_SW406_240528**	**Normal**	**EP2407413**	<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	<0.01
HSF	**SW408**	**28 May 2024**	**0089_QC109_240528**	**Field Duplicate**	**EP2407413**	<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	<0.01
HSF	**SW408**	**28 May 2024**	**0089_QC209_240528**	**Interlab Duplicate**	**1102636**	<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	<0.01	<0.05	<0.1
HSF	**SW408**	**28 May 2024**	**0089_SW408_240528**	**Normal**	**EP2407413**	<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	<0.01
HSF	**SW410**	**28 May 2024**	**0089_SW410_240528**	**Normal**	**EP2407413**	<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	<0.01
HSF	**SW412**	**28 May 2024**	**0089_SW412_240528**	**Normal**	**EP2407316**	<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	<0.01
HSF	**SW414**	**28 May 2024**	**0089_SW414_240528**	**Normal**	**EP2407316**	<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	<0.01
HSF	**SW416**	**28 May 2024**	**0089_SW416_240528**	**Normal**	**EP2407316**	<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	<0.01

Environmental Standards
HEPA, January 2020, PFAS NEMP 2020 Drinking Water
HEPA, January 2020, PFAS NEMP 2020 Interim Marine 99%
HEPA, January 2020, PFAS NEMP 2020 Recreational Water
Env Stds Comments
*Practical screening guideline of 0.01 µg/L adopted base on typical current laboratory limit of reporting.
Notes:
First-time detection of PFOA or PFOS+PFHxS
New exceedance of guideline value

						Inorganics									Metals			
						Carbonate Alkalinity (as CaCO3)	Alkalinity (Bicarbonate as CaCO3)	Alkalinity (Hydroxide) as CaCO3	Alkalinity (total) as CaCO3	Anions Total	Cations Total	Chloride	Ionic Balance	Sulphate as SO4 - Turbidimetric (filtered)	Calcium (filtered)	Magnesium (filtered)	Potassium (filtered)	Sodium (filtered)
						mg/L	mg/L	mg/L	mg/L	meq/L	meq/L	mg/L	%	mg/L	mg/L	mg/L	mg/L	mg/L
LOR - Limit of Reporting						1	1	1	1	0.01	0.01	1	0.01	1	1	1	1	1
PFAS NEMP 2020 Drinking Water																		
PFAS NEMP 2020 Interim Marine 99%																		
PFAS NEMP 2020 Recreational Water																		
Monitoring Area	**Location Code**	**Date**	**Field ID**	**Sample Type**	**Lab Report Number**													
		27 May 2024	0089_QC301_240527	Rinsate	EP2407306													
		27 May 2024	0089_QC302_240527	Rinsate	EP2407306													
		27 May 2024	0089_QC401_240527	Field Blank	EP2407306													
		27 May 2024	0089_QC402_240527	Field Blank	EP2407306													
		28 May 2024	0089_QC301_240528	Rinsate	EP2407384													
		28 May 2024	0089_QC302_240528	Rinsate	EP2407384													
		28 May 2024	0089_QC303_240528	Rinsate	EP2407384													
		28 May 2024	0089_QC401_240528	Field Blank	EP2407384													
		28 May 2024	0089_QC402_240528	Field Blank	EP2407384													
		28 May 2024	0089_QC403_240528	Field Blank	EP2407384													
		29 May 2024	0089_QC301_240529	Rinsate	EP2407418													
		29 May 2024	0089_QC302_240529	Rinsate	EP2407455													
		29 May 2024	0089_QC303_240529	Rinsate	EP2407418													
		29 May 2024	0089_QC401_240529	Field Blank	EP2407418													
		29 May 2024	0089_QC402_240529	Field Blank	EP2407455													
		29 May 2024	0089_QC403_240529	Field Blank	EP2407418													
Ship Sullage Area	MW010	29 May 2024	0089_MW010_240529	Normal	EP2407417	<1	317	<1	317	12.8	11.9	190	3.35	52	101	19	10	117
FTA	MW109	29 May 2024	0089_MW109_240529	Normal	EP2407418	<1	533	<1	533	19.3	18.0	273	3.30	45	124	57	<1	165
FTA	MW112	29 May 2024	0089_MW112_240529	Normal	EP2407418	<1	228	<1	228	6.53	6.79	42	1.96	38	91	13	2	26
FTA	MW120	29 May 2024	0089_MW120_240529	Normal	EP2407418	<1	256	<1	256	6.82	6.62	47	1.43	18	77	17	3	30
FTA	MW121	29 May 2024	0089_MW121_240529	Normal	EP2407418	<1	212	<1	212	6.41	6.80	63	2.98	19	81	12	3	39
FTA	MW123	29 May 2024	0089_MW123_240529	Normal	EP2407418	<1	282	<1	282	7.54	7.58	53	0.21	20	95	16	5	32
FTA	MW124	29 May 2024	0089_MW124_240529	Normal	EP2407418	<1	433	<1	433	527	470	16,900	5.71	1,980	464	1,120	419	7,900
FTA	MW125	29 May 2024	0089_MW125_240529	Normal	EP2407418	<1	412	<1	412	553	502	17,800	4.80	2,060	472	1,200	461	8,470
FTA	MW126	29 May 2024	0089_MW126_240529	Normal	EP2407418	<1	599	<1	599	483	426	15,500	6.31	1,630	405	1,070	372	7,080
FTA	MW127	29 May 2024	0089_MW127_240529	Normal	EP2407418	<1	616	<1	616	480	418	15,400	6.86	1,610	380	1,070	362	6,950
FTA	MW128	29 May 2024	0089_MW128_240529	Normal	EP2407418	<1	237	<1	237	6.96	6.58	56	2.82	31	78	13	2	36
Demolition Ground	MW139	28 May 2024	0089_MW139_240528	Normal	EP2407335	<1	266	<1	266	104	92.3	3,300	6.13	286	215	217	76	1,420
Demolition Ground	MW139	28 May 2024	0089_QC108_240528	Field Duplicate	EP2407335	<1	283	<1	283	124	112	3,940	5.38	361	233	266	94	1,740
Demolition Ground	MW139	28 May 2024	0089_QC208_240528	Interlab Duplicate	1102636													
Demolition Ground	MW141	28 May 2024	0089_MW141_240528	Normal	EP2407335	<1	353	<1	353	320	360	10,000	5.94	1,480	400	865	321	6,000
Demolition Ground	MW142	28 May 2024	0089_MW142_240528	Normal	EP2407335	<1	408	<1	408	391	437	12,200	5.61	1,840	408	1,040	410	7,370
Demolition Ground	MW147	28 May 2024	0089_MW147_240528	Normal	EP2407335	<1	481	<1	481	240	265	7,380	4.89	1,070	357	634	217	4,350
Demolition Ground	MW149	28 May 2024	0089_MW149_240528	Normal	EP2407335	<1	298	<1	298	480	533	15,100	5.16	2,330	425	1,260	519	9,070
WWTP	MW158	27 May 2024	0089_MW158_240527	Normal	EP2407306	<1	441	<1	441	138	143	4,220	1.87	495	207	346	111	2,340
WWTP	MW166	27 May 2024	0089_MW166_240527	Normal	EP2407306	<1	660	<1	660	49.1	49.3	1,160	0.17	153	152	134	59	670
WWTP	MW166	27 May 2024	0089_QC101_240527	Field Duplicate	EP2407306													
WWTP	MW166	27 May 2024	0089_QC201_240527	Interlab Duplicate	1102636													
WWTP	MW171	27 May 2024	0089_MW171_240527	Normal	EP2407306	<1	458	<1	458	61.7	67.7	1,660	4.58	277	113	188	69	1,030
WWTP	MW172	27 May 2024	0089_MW172_240527	Normal	EP2407306	<1	386	<1	386	42.1	44.3	1,080	2.55	190	100	120	52	647
WWTP	MW172	27 May 2024	0089_QC104_240527	Field Duplicate	EP2407306													
WWTP	MW172	27 May 2024	0089_QC204_240527	Interlab Duplicate	1102636													
WWTP	MW173	27 May 2024	0089_MW173_240527	Normal	EP2407273	<1	359	<1	359	17.9	18.6	335	1.78	63	109	60	13	181
WWTP	MW193	27 May 2024	0089_MW193_240527	Normal	EP2407273	<1	743	<1	743	41.2	38.8	783	2.99	207	110	140	34	482
WWTP	MW193	27 May 2024	0089_QC105_240527	Field Duplicate	EP2407273	<1	770	<1	770	41.9	42.2	785	0.39	210	112	149	38	538
WWTP	MW193	27 May 2024	0089_QC205_240527	Interlab Duplicate	1102636													
WWTP	MW195D	27 May 2024	0089_MW195D_240527	Normal	EP2407273	<1	218	<1	218	299	295	9,490	0.59	1,290	326	685	258	4,970
WWTP	MW195D	27 May 2024	0089_QC102_240527	Field Duplicate	EP2407273	<1	190	<1	190	334	331	10,600	0.48	1,500	350	758	289	5,600
WWTP	MW195D	27 May 2024	0089_QC202_240527	Interlab Duplicate	1102636													
WWTP	MW195S	27 May 2024	0089_MW195S_240527	Normal	EP2407273	<1	566	<1	566	40.8	39.3	841	1.87	277	174	123	41	447
WWTP	MW195S	27 May 2024	0089_QC103_240527	Field Duplicate	EP2407273	<1	583	<1	583	43.2	41.2	908	2.34	286	177	127	42	480
WWTP	MW195S	27 May 2024	0089_QC203_240527	Interlab Duplicate	1102636													
WWTP	MW199	29 May 2024	0089_MW199_240529	Normal	EP2407455	<1	946	<1	946	152	163	4,360	3.33	492	270	344	116	2,710
WWTP	MW200	29 May 2024	0089_MW200_240529	Normal	EP2407455	<1	448	<1	448	81.2	96.3	2,370	8.50	260	130	147	63	1,750
WWTP	MW202	29 May 2024	0089_MW202_240529	Normal	EP2407455	<1	368	<1	368	14.6	17.1	211	7.81	64	109	30	8	207
WWTP	MW203	29 May 2024	0089_MW203_240529	Normal	EP2407455	<1	319	<1	319	9.95	11.0	84	4.87	58	84	42	4	74
HSF	MW214	28 May 2024	0089_MW214_240528	Normal	EP2407384	<1	369	<1	369	31.7	30.2	825	2.33	50	178	58	9	376
HSF	MW215	28 May 2024	0089_MW215_240528	Normal	EP2407384	<1	380	<1	380	24.9	22.2	541	5.74	98	160	41	17	239
HSF	MW216	28 May 2024	0089_MW216_240528	Normal	EP2407384	<1	318	<1	318	24.0	24.8	557	1.63	91	162	55	14	271
HSF	MW217	28 May 2024	0089_MW217_240528	Normal	EP2407384	<1	277	<1	277	7.67	8.70	52	6.34	32	101	11	11	57
HSF	MW220	28 May 2024	0089_MW220_240528	Normal	EP2407384	<1	238	<1	238	6.36	6.43	39	0.61	24	80	13	6	28
HSF	MW224	28 May 2024	0089_MW224_240528	Normal	EP2407384	<1	260	<1	260	8.93	8.11	106	4.86	36	55	23	3	78
HSF	MW225	28 May 2024	0089_MW225_240528	Normal	EP2407384	<1	461	<1	461	36.7	32.1	932	6.68	56	158	82	12	394
HSF	MW226	28 May 2024	0089_MW226_240528	Normal	EP2407411	<1	672	<1	672	474	487	14,800	1.38	2,070	434	1,160	492	8,220

B1 - Water samples analytical results

						Inorganics									Metals			
						Carbonate Alkalinity (as CaCO3)	Alkalinity (Bicarbonate as CaCO3)	Alkalinity (Hydroxide) as CaCO3	Alkalinity (total) as CaCO3	Anions Total	Cations Total	Chloride	Ionic Balance	Sulphate as SO4 - Turbidimetric (filtered)	Calcium (filtered)	Magnesium (filtered)	Potassium (filtered)	Sodium (filtered)
						mg/L	mg/L	mg/L	mg/L	meq/L	meq/L	mg/L	%	mg/L	mg/L	mg/L	mg/L	mg/L
LOR - Limit of Reporting						1	1	1	1	0.01	0.01	1	0.01	1	1	1	1	1
PFAS NEMP 2020 Drinking Water																		
PFAS NEMP 2020 Interim Marine 99%																		
PFAS NEMP 2020 Recreational Water																		
Monitoring Area	**Location Code**	**Date**	**Field ID**	**Sample Type**	**Lab Report Number**													
HSF	**MW227**	**28 May 2024**	**0089_MW227_240528**	**Normal**	**EP2407411**	<1	792	<1	792	40.1	43.5	740	4.13	163	145	124	31	582
HSF	**MW228**	**28 May 2024**	**0089_MW228_240528**	**Normal**	**EP2407411**	<1	603	<1	603	202	217	5,980	3.63	1,010	211	533	183	3,630
HSF	**MW228**	**28 May 2024**	**0089_QC106_240528**	**Field Duplicate**	**EP2407411**	<1	706	<1	706	192	194	5,570	0.61	974	195	489	166	3,210
HSF	**MW228**	**28 May 2024**	**0089_QC206_240528**	**Interlab Duplicate**	**1102636**													
AVCAT Storage and Fuel Farm	**MW233**	**29 May 2024**	**0089_MW233_240529**	**Normal**	**EP2407455**	<1	104	<1	104	2.62	3.09	15	8.18	6	38	6	2	15
	MW238	**29 May 2024**	**0089_MW238_240529**	**Normal**	**EP2407417**	<1	234	<1	234	7.70	7.76	46	0.38	83	95	18	4	33
	MW239	**29 May 2024**	**0089_MW239_240529**	**Normal**	**EP2407417**	<1	234	<1	234	7.73	8.31	42	3.60	90	105	20	3	31
	MW240	**29 May 2024**	**0089_MW240_240529**	**Normal**	**EP2407417**	<1	263	<1	263	8.19	8.72	54	3.09	68	120	15	4	32
	MW243	**29 May 2024**	**0089_MW243_240529**	**Normal**	**EP2407417**	<1	298	<1	298	9.06	9.56	52	2.64	79	124	17	9	40
	MW245	**29 May 2024**	**0089_MW245_240529**	**Normal**	**EP2407417**	<1	182	<1	182	4.09	4.40	16	3.73	<1	56	7	3	22
	MW249	**29 May 2024**	**0089_MW249_240529**	**Normal**	**EP2407417**	<1	430	<1	430	15.2	14.5	197	2.16	50	102	41	10	134
Fire Station, Flammable/Hazardous Goods and Waste Storage, Ship Sullage	**MW255**	**28 May 2024**	**0089_MW255_240528**	**Normal**	**EP2407384**	<1	384	<1	384	9.96	9.26	53	3.65	38	98	22	3	57
	MW256	**28 May 2024**	**0089_MW256_240528**	**Normal**	**EP2407384**	<1	651	<1	651	32.7	30.6	649	3.28	68	144	110	9	326
	MW257	**28 May 2024**	**0089_MW257_240528**	**Normal**	**EP2407384**	<1	243	<1	243	6.29	6.09	37	1.67	19	80	11	4	25
	MW258	**28 May 2024**	**0089_MW258_240528**	**Normal**	**EP2407384**	<1	368	<1	368	14.4	15.0	190	2.20	79	132	42	17	104
	MW259	**28 May 2024**	**0089_MW259_240528**	**Normal**	**EP2407384**	<1	388	<1	388	9.45	9.42	50	0.19	14	108	27	6	38
Dredge Spoil / Careening B	**MW268**	**28 May 2024**	**0089_MW268_240528**	**Normal**	**EP2407411**	<1	402	<1	402	191	212	5,700	5.24	1,050	286	497	170	3,500
Dredge Spoil / Careening B	**MW269**	**29 May 2024**	**0089_MW269_240529**	**Normal**	**EP2407417**	<1	450	<1	450	20.4	17.2	328	8.54	106	91	65	15	160
Accomodation Area	**MW288**	**28 May 2024**	**0089_MW288_240528**	**Normal**	**EP2407411**	<1	293	<1	293	8.98	9.60	63	3.33	65	97	24	7	60
Accomodation Area	**MW289**	**29 May 2024**	**0089_MW289_240529**	**Normal**	**EP2407455**	<1	523	<1	523	14.4	12.1	84	8.70	78	109	34	6	86
0089	**MW468**	**29 May 2024**	**0089_MW468_240529**	**Normal**	**EP2407455**	<1	626	<1	626	204	242	6,230	8.49	771	308	542	152	4,100
AVCAT Storage and Fuel Fa	**MW496**	**29 May 2024**	**0089_MW496_240529**	**Normal**	**EP2407417**	<1	465	<1	465	16.3	15.5	212	2.39	49	86	43	17	167
FTA	**MW500**	**29 May 2024**	**0089_MW500_240529**	**Normal**	**EP2407418**	<1	527	<1	527	12.9	11.0	60	7.82	31	153	18	4	41
AVCAT Storage and Fuel Fa	**MW516**	**29 May 2024**	**0089_MW516_240529**	**Normal**	**EP2407417**	<1	548	<1	548	13.5	13.9	90	1.48	<5	93	72	11	70
Ship Sullage Area	**MW553**	**29 May 2024**	**0089_MW553_240529**	**Normal**	**EP2407417**	<1	461	<1	461	15.4	14.5	153	2.92	91	148	26	11	109
WWTP (East)	**PW304**	**29 May 2024**	**0089_PW304_240529**	**Normal**	**EP2407420**	<1	194	<1	194	622	580	20,200	3.48	2,340	411	1,240	388	10,300
HSF	**PW306**	**28 May 2024**	**0089_PW306_240528**	**Normal**	**EP2407316**	<1	196	<1	196	529	581	17,000	4.63	2,210	441	1,330	564	10,000
HSF	**PW307**	**28 May 2024**	**0089_PW307_240528**	**Normal**	**EP2407316**	<1	298	<1	298	542	611	17,300	5.96	2,320	488	1,390	608	10,500
HSF	**PW307**	**28 May 2024**	**0089_QC111_240528**	**Field Duplicate**	**EP2407316**													
HSF	**PW307**	**28 May 2024**	**0089_QC211_240528**	**Interlab Duplicate**	**1102636**													
HSF	**PW308**	**28 May 2024**	**0089_PW308_240528**	**Normal**	**EP2407316**	<1	146	<1	146	539	602	17,300	5.56	2,290	441	1,370	581	10,400
HSF	**PW314**	**28 May 2024**	**0089_PW314_240528**	**Normal**	**EP2407316**	<1	126	<1	126	567	607	18,300	3.41	2,320	437	1,380	586	10,500
HSF	**PW315**	**28 May 2024**	**0089_PW315_240528**	**Normal**	**EP2407316**	<1	124	<1	124	569	607	18,300	3.26	2,410	438	1,380	589	10,500
Demolition Ground	**PW329**	**28 May 2024**	**0089_PW329_240528**	**Normal**	**EP2407337**	<1	228	<1	228	504	575	15,900	6.55	2,470	446	1,350	542	9,840
Demolition Ground	**PW329**	**28 May 2024**	**0089_QC115_240528**	**Field Duplicate**	**EP2407337**	<1	175	<1	175	518	605	16,400	7.78	2,470	464	1,390	587	10,400
Demolition Ground	**PW329**	**28 May 2024**	**0089_QC215_240528**	**Interlab Duplicate**	**1102636**													
Demolition Ground	**PW330**	**28 May 2024**	**0089_PW330_240528**	**Normal**	**EP2407337**	<1	124	<1	124	548	608	17,500	5.17	2,520	446	1,390	590	10,500
Demolition Ground	**PW331**	**28 May 2024**	**0089_PW331_240528**	**Normal**	**EP2407337**	<1	124	<1	124	529	602	16,800	6.38	2,550	442	1,420	575	10,300
FTA	**PW335**	**29 May 2024**	**0089_PW335_240529**	**Normal**	**EP2407422**	<1	131	<1	131	530	608	16,700	6.87	2,690	440	1,390	577	10,500
FTA	**PW340**	**29 May 2024**	**0089_PW340_240529**	**Normal**	**EP2407422**	<1	164	<1	164	574	553	18,300	1.84	2,610	416	1,270	518	9,530
FTA	**PW341**	**29 May 2024**	**0089_PW341_240529**	**Normal**	**EP2407422**	<1	166	<1	166	639	633	20,800	0.50	2,370	454	1,370	407	11,200
WWTP (East)	**PW345**	**29 May 2024**	**0089_PW345_240529**	**Normal**	**EP2407420**	<1	136	<1	136	538	522	17,400	1.58	2,150	352	1,100	348	9,300
Accomodation Area	**PW346**	**28 May 2024**	**0089_PW346_240528**	**Normal**	**EP2407413**	<1	247	<1	247	471	527	15,000	5.62	2,060	399	1,210	509	9,070
WWTP (West)	**PW350**	**27 May 2024**	**0089_PW350_240527**	**Normal**	**EP2407275**	<1	120	<1	120	552	610	17,600	4.98	2,580	414	1,370	629	10,600
WWTP (West)	**PW352**	**27 May 2024**	**0089_PW352_240527**	**Normal**	**EP2407275**	<1	120	<1	120	574	611	18,400	3.05	2,550	417	1,370	629	10,600
Demolition Ground	**PW356**	**28 May 2024**	**0089_PW356_240528**	**Normal**	**EP2407337**	<1	150	<1	150	502	582	15,900	7.37	2,450	438	1,370	557	9,970
Demolition Ground	**PW356**	**28 May 2024**	**0089_QC114_240528**	**Field Duplicate**	**EP2407337**	<1	140	<1	140	486	562	15,300	7.26	2,490	422	1,280	548	9,700
Demolition Ground	**PW356**	**28 May 2024**	**0089_QC214_240528**	**Interlab Duplicate**	**1102636**													
Demolition Ground	**PW357**	**28 May 2024**	**0089_PW357_240528**	**Normal**	**EP2407337**	<1	122	<1	122	510	594	16,100	7.61	2,560	433	1,390	558	10,200
Demolition Ground	**PW358**	**28 May 2024**	**0089_PW358_240528**	**Normal**	**EP2407337**	<1	121	<1	121	528	612	16,700	7.44	2,600	447	1,440	581	10,500

						Inorganics									Metals			
						Carbonate Alkalinity (as CaCO3)	Alkalinity (Bicarbonate as CaCO3)	Alkalinity (Hydroxide) as CaCO3	Alkalinity (total) as CaCO3	Anions Total	Cations Total	Chloride	Ionic Balance	Sulphate as SO4 - Turbidimetric (filtered)	Calcium (filtered)	Magnesium (filtered)	Potassium (filtered)	Sodium (filtered)
						mg/L	mg/L	mg/L	mg/L	meq/L	meq/L	mg/L	%	mg/L	mg/L	mg/L	mg/L	mg/L
LOR - Limit of Reporting						1	1	1	1	0.01	0.01	1	0.01	1	1	1	1	1
PFAS NEMP 2020 Drinking Water																		
PFAS NEMP 2020 Interim Marine 99%																		
PFAS NEMP 2020 Recreational Water																		
Monitoring Area	**Location Code**	**Date**	**Field ID**	**Sample Type**	**Lab Report Number**													
FTA	**PW362**	**29 May 2024**	**0089_PW362_240529**	**Normal**	**EP2407422**	<1	186	<1	186	649	651	21,100	0.12	2,420	463	1,420	419	11,500
FTA	**PW363**	**29 May 2024**	**0089_PW363_240529**	**Normal**	**EP2407422**	<1	144	<1	144	620	612	20,200	0.72	2,300	428	1,340	402	10,800
FTA	**PW364**	**29 May 2024**	**0089_PW364_240529**	**Normal**	**EP2407422**	<1	178	<1	178	653	632	21,200	1.63	2,460	432	1,370	404	11,200
WWTP (East)	**PW367**	**29 May 2024**	**0089_PW367_240529**	**Normal**	**EP2407420**	<1	138	<1	138	501	484	16,200	1.68	1,980	343	1,040	332	8,580
WWTP (East)	**PW368**	**29 May 2024**	**0089_PW368_240529**	**Normal**	**EP2407420**	<1	181	<1	181	633	619	20,600	1.13	2,340	423	1,330	400	11,000
WWTP (East)	**PW369**	**29 May 2024**	**0089_PW369_240529**	**Normal**	**EP2407420**	<1	124	<1	124	657	642	21,400	1.15	2,430	438	1,380	412	11,400
Dredge Spoil / Careening B	**PW374**	**28 May 2024**	**0089_PW374_240528**	**Normal**	**EP2407413**	<1	412	<1	412	444	531	13,800	8.87	2,260	391	1,200	528	9,180
Dredge Spoil / Careening B	**PW375**	**28 May 2024**	**0089_PW375_240528**	**Normal**	**EP2407413**	<1	183	<1	183	520	613	16,400	8.20	2,580	448	1,390	590	10,600
Dredge Spoil / Careening B	**PW378**	**28 May 2024**	**0089_PW378_240528**	**Normal**	**EP2407413**	<1	146	<1	146	444	525	14,100	8.33	2,110	394	1,200	502	9,060
WWTP (West)	**PW380**	**27 May 2024**	**0089_PW380_240527**	**Normal**	**EP2407275**	<1	121	<1	121	560	620	17,900	5.13	2,520	418	1,380	633	10,800
WWTP (West)	**PW381**	**27 May 2024**	**0089_PW381_240527**	**Normal**	**EP2407275**	<1	120	<1	120	568	615	18,200	3.93	2,530	416	1,370	626	10,700
WWTP (West)	**PW401**	**27 May 2024**	**0089_PW401_240527**	**Normal**	**EP2407275**	<1	121	<1	121	546	616	17,400	6.07	2,510	417	1,380	632	10,700
HSF	**PW405**	**28 May 2024**	**0089_PW405_240528**	**Normal**	**EP2407413**	<1	127	<1	127	525	598	16,600	6.50	2,590	441	1,370	582	10,300
HSF	**PW407**	**28 May 2024**	**0089_PW407_240528**	**Normal**	**EP2407413**	<1	126	<1	126	520	592	16,500	6.46	2,500	432	1,360	573	10,200
HSF	**PW409**	**28 May 2024**	**0089_PW409_240528**	**Normal**	**EP2407413**	<1	133	<1	133	496	568	15,700	6.84	2,400	421	1,340	537	9,730
HSF	**PW411**	**28 May 2024**	**0089_PW411_240528**	**Normal**	**EP2407316**	<1	220	<1	220	518	574	16,600	5.16	2,180	455	1,310	570	9,870
HSF	**PW411**	**28 May 2024**	**0089_QC116_240528**	**Field Duplicate**	**EP2407316**													
HSF	**PW411**	**28 May 2024**	**0089_QC216_240528**	**Interlab Duplicate**	**1102636**													
HSF	**PW413**	**28 May 2024**	**0089_PW413_240528**	**Normal**	**EP2407316**	<1	166	<1	166	522	583	16,700	5.53	2,300	422	1,320	564	10,100
HSF	**PW415**	**28 May 2024**	**0089_PW415_240528**	**Normal**	**EP2407316**	<1	160	<1	160	538	575	17,200	3.39	2,360	418	1,300	555	9,960
FTA	**SW130**	**29 May 2024**	**0089_SW130_240529**	**Normal**	**EP2407422**	<1	123	<1	123	540	619	17,100	6.83	2,630	446	1,410	584	10,700
FTA	**SW132**	**29 May 2024**	**0089_SW132_240529**	**Normal**	**EP2407422**	<1	166	<1	166	531	598	16,900	5.93	2,440	412	1,290	392	10,600
FTA	**SW134**	**29 May 2024**	**0089_SW134_240529**	**Normal**	**EP2407422**	<1	124	<1	124	662	666	21,600	0.28	2,420	446	1,450	431	11,800
Demolition Ground	**SW150**	**28 May 2024**	**0089_QC112_240528**	**Field Duplicate**	**EP2407337**	<1	120	<1	120	535	607	17,000	6.29	2,560	447	1,430	578	10,400
Demolition Ground	**SW150**	**28 May 2024**	**0089_QC212_240528**	**Interlab Duplicate**	**1102636**													
Demolition Ground	**SW150**	**28 May 2024**	**0089_SW150_240528**	**Normal**	**EP2407337**	<1	131	<1	131	545	603	17,400	5.04	2,490	444	1,380	589	10,400
Demolition Ground	**SW152**	**28 May 2024**	**0089_SW152_240528**	**Normal**	**EP2407337**	<1	120	<1	120	531	606	16,800	6.56	2,650	444	1,420	575	10,400
Demolition Ground	**SW154**	**28 May 2024**	**0089_SW154_240528**	**Normal**	**EP2407337**	<1	120	<1	120	511	602	16,000	8.17	2,740	442	1,420	574	10,300
Demolition Ground	**SW156**	**28 May 2024**	**0089_QC113_240528**	**Field Duplicate**	**EP2407337**	<1	120	<1	120	509	607	16,000	8.80	2,650	447	1,430	578	10,400
Demolition Ground	**SW156**	**28 May 2024**	**0089_QC213_240528**	**Interlab Duplicate**	**1102636**													
Demolition Ground	**SW156**	**28 May 2024**	**0089_SW156_240528**	**Normal**	**EP2407337**	<1	120	<1	120	534	602	17,000	5.99	2,480	440	1,420	574	10,300
WWTP (East)	**SW305**	**29 May 2024**	**0089_SW305_240529**	**Normal**	**EP2407420**	<1	131	<1	131	653	664	21,300	0.81	2,400	459	1,420	431	11,800
HSF	**SW309**	**28 May 2024**	**0089_SW309_240528**	**Normal**	**EP2407316**	<1	122	<1	122	552	618	17,800	5.63	2,280	441	1,400	595	10,700
HSF	**SW310**	**28 May 2024**	**0089_SW310_240528**	**Normal**	**EP2407316**	<1	124	<1	124	541	612	17,400	6.17	2,300	436	1,390	591	10,600
HSF	**SW311**	**28 May 2024**	**0089_SW311_240528**	**Normal**	**EP2407316**	<1	123	<1	123	560	626	18,100	5.50	2,280	454	1,430	610	10,800
Dredge Spoil / Careening B	**SW317**	**28 May 2024**	**0089_SW317_240528**	**Normal**	**EP2407413**	<1	123	<1	123	530	630	16,800	8.65	2,560	453	1,430	609	10,900
Dredge Spoil / Careening B	**SW318**	**28 May 2024**	**0089_SW318_240528**	**Normal**	**EP2407413**	<1	126	<1	126	543	614	17,200	6.14	2,640	446	1,400	592	10,600
Dredge Spoil / Careening B	**SW319**	**28 May 2024**	**0089_SW319_240528**	**Normal**	**EP2407413**	<1	123	<1	123	557	613	17,700	4.84	2,640	442	1,400	589	10,600
WWTP (West)	**SW353**	**27 May 2024**	**0089_SW353_240527**	**Normal**	**EP2407272**	<1	120	<1	120	536	610	17,000	6.40	2,610	413	1,360	624	10,600
WWTP (East)	**SW370**	**29 May 2024**	**0089_SW370_240529**	**Normal**	**EP2407420**	<1	144	<1	144	655	618	21,400	2.93	2,350	432	1,310	404	11,000
WWTP (East)	**SW371**	**29 May 2024**	**0089_SW371_240529**	**Normal**	**EP2407420**	<1	128	<1	128	646	621	21,000	1.96	2,450	437	1,340	410	11,000
WWTP (East)	**SW372**	**28 May 2024**	**0089_SW372_240528**	**Normal**	**EP2407413**	<1	134	<1	134	526	603	16,600	6.82	2,640	441	1,380	586	10,400
WWTP (West)	**SW373**	**28 May 2024**	**0089_SW373_240528**	**Normal**	**EP2407413**	<1	130	<1	130	528	603	16,800	6.55	2,500	436	1,380	584	10,400
WWTP (West)	**SW382**	**27 May 2024**	**0089_SW382_240527**	**Normal**	**EP2407272**	<1	124	<1	124	534	632	16,900	8.46	2,610	425	1,410	643	11,000
WWTP (West)	**SW383**	**27 May 2024**	**0089_SW383_240527**	**Normal**	**EP2407272**	<1	120	<1	120	526	615	16,700	7.79	2,510	447	1,410	594	10,600
WWTP (West)	**SW384**	**27 May 2024**	**0089_SW384_240527**	**Normal**	**EP2407272**	<1	120	<1	120	531	615	16,900	7.33	2,490	415	1,370	628	10,700
HSF	**SW406**	**28 May 2024**	**0089_SW406_240528**	**Normal**	**EP2407413**	<1	124	<1	124	508	595	16,000	7.91	2,590	434	1,400	565	10,200
HSF	**SW408**	**28 May 2024**	**0089_QC109_240528**	**Field Duplicate**	**EP2407413**	<1	127	<1	127	523	584	16,600	5.54	2,500	430	1,380	554	10,000
HSF	**SW408**	**28 May 2024**	**0089_QC209_240528**	**Interlab Duplicate**	**1102636**													
HSF	**SW408**	**28 May 2024**	**0089_SW408_240528**	**Normal**	**EP2407413**	<1	132	<1	132	514	583	16,300	6.25	2,480	425	1,370	552	9,990
HSF	**SW410**	**28 May 2024**	**0089_SW410_240528**	**Normal**	**EP2407413**	<1	124	<1	124	500	596	15,800	8.76	2,500	440	1,410	569	10,200
HSF	**SW412**	**28 May 2024**	**0089_SW412_240528**	**Normal**	**EP2407316**	<1	128	<1	128	540	607	17,400	5.84	2,250	440	1,380	588	10,500
HSF	**SW414**	**28 May 2024**	**0089_SW414_240528**	**Normal**	**EP2407316**	<1	132	<1	132	558	607	17,900	4.24	2,410	437	1,380	589	10,500
HSF	**SW416**	**28 May 2024**	**0089_SW416_240528**	**Normal**	**EP2407316**	<1	128	<1	128	536	608	17,200	6.34	2,310	442	1,390	593	10,500

Environmental Standards
HEPA, January 2020, PFAS NEMP 2020 Drinking Water
HEPA, January 2020, PFAS NEMP 2020 Interim Marine 99%
HEPA, January 2020, PFAS NEMP 2020 Recreational Water
Env Stds Comments
*Practical screening guideline of 0.01 µg/L adopted base on typical current laboratory limit of reporting.
Notes:
First-time detection of PFOA or PFOS+PFHxS
New exceedance of guideline value

						PFAS - Perfluoroalkyl Sulfonic Acids						PFAS - Perfluoroalkyl Carboxylic Acids						
						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)
						mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
LOR - Limit of Reporting						0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.001	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002
Monitoring Area	**Location Code**	**Date**	**Field ID**	**Sample Type**	**Lab Report Number**													
WWTP	**SD304**	**29 May 2024**	**0089_SD304_240529**	**Normal**	**EP2407421**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
HSF	**SD306**	**28 May 2024**	**0089_SD306_240528**	**Normal**	**EP2407314**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
HSF	**SD307**	**28 May 2024**	**0089_QC110_240528**	**Field Duplicate**	**EP2407314**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
HSF	**SD307**	**28 May 2024**	**0089_QC210_240528**	**Interlab Duplicate**	**1102636**	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
HSF	**SD307**	**28 May 2024**	**0089_SD307_240528**	**Normal**	**EP2407314**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
HSF	**SD308**	**28 May 2024**	**0089_SD308_240528**	**Normal**	**EP2407314**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
HSF	**SD314**	**28 May 2024**	**0089_SD314_240528**	**Normal**	**EP2407314**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
HSF	**SD315**	**28 May 2024**	**0089_SD315_240528**	**Normal**	**EP2407314**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Demolition ground	**SD329**	**28 May 2024**	**0089_SD329_240528**	**Normal**	**EP2407336**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Demolition ground	**SD330**	**28 May 2024**	**0089_SD330_240528**	**Normal**	**EP2407336**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Demolition ground	**SD331**	**28 May 2024**	**0089_SD331_240528**	**Normal**	**EP2407336**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
FTA	**SD335**	**29 May 2024**	**0089_SD335_240529**	**Normal**	**EP2407423**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
FTA	**SD340**	**29 May 2024**	**0089_SD340_240529**	**Normal**	**EP2407423**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
FTA	**SD341**	**29 May 2024**	**0089_SD341_240529**	**Normal**	**EP2407423**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
WWTP	**SD345**	**29 May 2024**	**0089_SD345_240529**	**Normal**	**EP2407421**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Accomodation Area	**SD346**	**28 May 2024**	**0089_SD346_240528**	**Normal**	**EP2407412**	<0.0002	<0.0002	<0.0002	<0.0002	0.0021	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
WWTP	**SD350**	**27 May 2024**	**0089_SD350_240527**	**Normal**	**EP2407274**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
WWTP	**SD351**	**27 May 2024**	**0089_SD351_240527**	**Normal**	**EP2407274**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
WWTP	**SD352**	**27 May 2024**	**0089_SD352_240527**	**Normal**	**EP2407274**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Demolition ground	**SD356**	**28 May 2024**	**0089_SD356_240528**	**Normal**	**EP2407336**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Demolition ground	**SD357**	**28 May 2024**	**0089_SD357_240528**	**Normal**	**EP2407336**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Demolition ground	**SD358**	**28 May 2024**	**0089_SD358_240528**	**Normal**	**EP2407336**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
FTA	**SD362**	**29 May 2024**	**0089_SD362_240529**	**Normal**	**EP2407423**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
FTA	**SD363**	**29 May 2024**	**0089_SD363_240529**	**Normal**	**EP2407423**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
FTA	**SD364**	**29 May 2024**	**0089_SD364_240529**	**Normal**	**EP2407423**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
WWTP	**SD367**	**29 May 2024**	**0089_SD367_240529**	**Normal**	**EP2407421**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
WWTP	**SD368**	**29 May 2024**	**0089_SD368_240529**	**Normal**	**EP2407421**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
WWTP	**SD369**	**29 May 2024**	**0089_SD369_240529**	**Normal**	**EP2407421**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Dredge spoil and careening	**SD374**	**28 May 2024**	**0089_SD374_240528**	**Normal**	**EP2407412**	<0.0002	<0.0002	<0.0002	<0.0002	0.0005	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Dredge spoil and careening	**SD375**	**28 May 2024**	**0089_SD375_240528**	**Normal**	**EP2407412**	<0.0002	<0.0002	<0.0002	<0.0002	0.0006	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Dredge spoil and careening	**SD378**	**28 May 2024**	**0089_SD378_240528**	**Normal**	**EP2407412**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
WWTP	**SD380**	**27 May 2024**	**0089_SD380_240527**	**Normal**	**EP2407274**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
WWTP	**SD381**	**27 May 2024**	**0089_SD381_240527**	**Normal**	**EP2407274**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
WWTP	**SD401**	**27 May 2024**	**0089_SD401_240527**	**Normal**	**EP2407274**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
HSF	**SD405**	**28 May 2024**	**0089_QC107_240528**	**Field Duplicate**	**EP2407412**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
HSF	**SD405**	**28 May 2024**	**0089_QC207_240528**	**Interlab Duplicate**	**1102636**	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
HSF	**SD405**	**28 May 2024**	**0089_SD405_240528**	**Normal**	**EP2407412**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
HSF	**SD407**	**28 May 2024**	**0089_SD407_240528**	**Normal**	**EP2407412**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
HSF	**SD409**	**28 May 2024**	**0089_SD409_240528**	**Normal**	**EP2407412**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
HSF	**SD411**	**28 May 2024**	**0089_QC117_240528**	**Field Duplicate**	**EP2407314**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
HSF	**SD411**	**28 May 2024**	**0089_QC217_240528**	**Interlab Duplicate**	**1102636**	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
HSF	**SD411**	**28 May 2024**	**0089_SD411_240528**	**Normal**	**EP2407314**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
HSF	**SD413**	**28 May 2024**	**0089_QC118_240528**	**Field Duplicate**	**EP2407314**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
HSF	**SD413**	**28 May 2024**	**0089_QC218_240528**	**Interlab Duplicate**	**1102636**	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
HSF	**SD413**	**28 May 2024**	**0089_SD413_240528**	**Normal**	**EP2407314**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
HSF	**SD415**	**28 May 2024**	**0089_SD415_240528**	**Normal**	**EP2407314**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002

Notes:

First-time detection of PFOA or PFOS+PFHxS

						PFAS - (n:2) Fluorotelomer Sulfonic Acids				PFAS - Perfluoroalkyl Sulfonamides							PFAS		
						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 (WA DER List)	Sum of PFAS
						mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
LOR - Limit of Reporting						0.0002	0.0002	0.0002	0.0005	0.0005	0.0005	0.0005	0.0005	0.0002	0.0005	0.0002	0.0005	0.0005	0.0002	0.0005	0.0002	0.0002	0.0002
Monitoring Area	**Location Code**	**Date**	**Field ID**	**Sample Type**	**Lab Report Number**																		
WWTP	**SD304**	**29 May 2024**	**0089_SD304_240529**	**Normal**	**EP2407421**	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
HSF	**SD306**	**28 May 2024**	**0089_SD306_240528**	**Normal**	**EP2407314**	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
HSF	**SD307**	**28 May 2024**	**0089_QC110_240528**	**Field Duplicate**	**EP2407314**	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
HSF	**SD307**	**28 May 2024**	**0089_QC210_240528**	**Interlab Duplicate**	**1102636**	<0.005	<0.005	<0.005	<0.005	<0.005	<0.01	<0.005	<0.005	<0.005	<0.005	<0.01	<0.005	<0.005	<0.01	<0.005	<0.005	<0.01	<0.05
HSF	**SD307**	**28 May 2024**	**0089_SD307_240528**	**Normal**	**EP2407314**	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
HSF	**SD308**	**28 May 2024**	**0089_SD308_240528**	**Normal**	**EP2407314**	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
HSF	**SD314**	**28 May 2024**	**0089_SD314_240528**	**Normal**	**EP2407314**	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
HSF	**SD315**	**28 May 2024**	**0089_SD315_240528**	**Normal**	**EP2407314**	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
Demolition ground	**SD329**	**28 May 2024**	**0089_SD329_240528**	**Normal**	**EP2407336**	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
Demolition ground	**SD330**	**28 May 2024**	**0089_SD330_240528**	**Normal**	**EP2407336**	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
Demolition ground	**SD331**	**28 May 2024**	**0089_SD331_240528**	**Normal**	**EP2407336**	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
FTA	**SD335**	**29 May 2024**	**0089_SD335_240529**	**Normal**	**EP2407423**	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
FTA	**SD340**	**29 May 2024**	**0089_SD340_240529**	**Normal**	**EP2407423**	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
FTA	**SD341**	**29 May 2024**	**0089_SD341_240529**	**Normal**	**EP2407423**	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
WWTP	**SD345**	**29 May 2024**	**0089_SD345_240529**	**Normal**	**EP2407421**	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
Accomodation Area	**SD346**	**28 May 2024**	**0089_SD346_240528**	**Normal**	**EP2407412**	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	0.0021	0.0021	0.0021
WWTP	**SD350**	**27 May 2024**	**0089_SD350_240527**	**Normal**	**EP2407274**	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
WWTP	**SD351**	**27 May 2024**	**0089_SD351_240527**	**Normal**	**EP2407274**	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
WWTP	**SD352**	**27 May 2024**	**0089_SD352_240527**	**Normal**	**EP2407274**	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
Demolition ground	**SD356**	**28 May 2024**	**0089_SD356_240528**	**Normal**	**EP2407336**	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
Demolition ground	**SD357**	**28 May 2024**	**0089_SD357_240528**	**Normal**	**EP2407336**	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
Demolition ground	**SD358**	**28 May 2024**	**0089_SD358_240528**	**Normal**	**EP2407336**	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
FTA	**SD362**	**29 May 2024**	**0089_SD362_240529**	**Normal**	**EP2407423**	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
FTA	**SD363**	**29 May 2024**	**0089_SD363_240529**	**Normal**	**EP2407423**	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
FTA	**SD364**	**29 May 2024**	**0089_SD364_240529**	**Normal**	**EP2407423**	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
WWTP	**SD367**	**29 May 2024**	**0089_SD367_240529**	**Normal**	**EP2407421**	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
WWTP	**SD368**	**29 May 2024**	**0089_SD368_240529**	**Normal**	**EP2407421**	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
WWTP	**SD369**	**29 May 2024**	**0089_SD369_240529**	**Normal**	**EP2407421**	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
Dredge spoil and careening	**SD374**	**28 May 2024**	**0089_SD374_240528**	**Normal**	**EP2407412**	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	0.0005	0.0005	0.0005
Dredge spoil and careening	**SD375**	**28 May 2024**	**0089_SD375_240528**	**Normal**	**EP2407412**	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	0.0006	0.0006	0.0006
Dredge spoil and careening	**SD378**	**28 May 2024**	**0089_SD378_240528**	**Normal**	**EP2407412**	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
WWTP	**SD380**	**27 May 2024**	**0089_SD380_240527**	**Normal**	**EP2407274**	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
WWTP	**SD381**	**27 May 2024**	**0089_SD381_240527**	**Normal**	**EP2407274**	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
WWTP	**SD401**	**27 May 2024**	**0089_SD401_240527**	**Normal**	**EP2407274**	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
HSF	**SD405**	**28 May 2024**	**0089_QC107_240528**	**Field Duplicate**	**EP2407412**	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
HSF	**SD405**	**28 May 2024**	**0089_QC207_240528**	**Interlab Duplicate**	**1102636**	<0.005	<0.005	<0.005	<0.005	<0.005	<0.01	<0.005	<0.005	<0.005	<0.005	<0.01	<0.005	<0.005	<0.01	<0.005	<0.005	<0.01	<0.05
HSF	**SD405**	**28 May 2024**	**0089_SD405_240528**	**Normal**	**EP2407412**	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
HSF	**SD407**	**28 May 2024**	**0089_SD407_240528**	**Normal**	**EP2407412**	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
HSF	**SD409**	**28 May 2024**	**0089_SD409_240528**	**Normal**	**EP2407412**	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
HSF	**SD411**	**28 May 2024**	**0089_QC117_240528**	**Field Duplicate**	**EP2407314**	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
HSF	**SD411**	**28 May 2024**	**0089_QC217_240528**	**Interlab Duplicate**	**1102636**	<0.005	<0.005	<0.005	<0.005	<0.005	<0.01	<0.005	<0.005	<0.005	<0.005	<0.01	<0.005	<0.005	<0.01	<0.005	<0.005	<0.01	<0.05
HSF	**SD411**	**28 May 2024**	**0089_SD411_240528**	**Normal**	**EP2407314**	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
HSF	**SD413**	**28 May 2024**	**0089_QC118_240528**	**Field Duplicate**	**EP2407314**	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
HSF	**SD413**	**28 May 2024**	**0089_QC218_240528**	**Interlab Duplicate**	**1102636**	<0.005	<0.005	<0.005	<0.005	<0.005	<0.01	<0.005	<0.005	<0.005	<0.005	<0.01	<0.005	<0.005	<0.01	<0.005	<0.005	<0.01	<0.05
HSF	**SD413**	**28 May 2024**	**0089_SD413_240528**	**Normal**	**EP2407314**	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
HSF	**SD415**	**28 May 2024**	**0089_SD415_240528**	**Normal**	**EP2407314**	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002

Notes:

First-time detection of PFOA or PFOS+PFHxS

			Date	27 May 2024	27 May 2024		27 May 2024	27 May 2024		27 May 2024	27 May 2024		27 May 2024	27 May 2024	
			Field ID	0089_MW195D_240527	0089_QC102_240527		0089_MW195D_240527	0089_QC202_240527		0089_MW166_240527	0089_QC101_240527		0089_MW166_240527	0089_QC201_240527	
			Matrix Type	Water	Water		Water	Water		Water	Water		Water	Water	
			Lab Report Number	EP2407273	EP2407273	RPD	EP2407273	1102636	RPD	EP2407306	EP2407306	RPD	EP2407306	1102636	RPD
	Unit	LOR													
PFAS - Perfluoroalkyl Sulfonic Acids															
Perfluorobutane sulfonic acid (PFBS)	µg/L	0.01	<0.02	<0.02	0	<0.02	<0.01	0	0.08	0.08	0	0.08	0.12	40
Perfluoropentane sulfonic acid (PFPeS)	µg/L	0.01	<0.02	<0.02	0	<0.02	<0.01	0	0.03	0.03	0	0.03	0.07	80
Perfluorohexane sulfonic acid (PFHxS)	µg/L	0.01	0.01	0.02	67	0.01	0.04	120	1.59	1.62	2	1.59	3.3	**70**
Perfluoroheptane sulfonic acid (PFHpS)	µg/L	0.01	<0.02	<0.02	0	<0.02	<0.01	0	0.49	0.50	2	0.49	1.1	**77**
Perfluorooctane sulfonic acid (PFOS)	µg/L	0.01	<0.01	<0.01	0	<0.01	0.02	67	5.61	6.11	9	5.61	13	**79**
Perfluorononanesulfonic acid (PFNS)	µg/L	0.01					<0.01						<0.01	
Perfluorodecane sulfonic acid (PFDS)	µg/L	0.01	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0
PFAS - Perfluoroalkyl Carboxylic Acids															
Perfluorobutanoic acid (PFBA)	µg/L	0.05	<0.1	<0.1	0	<0.1	<0.05	0	0.1	0.1	0	0.1	0.15	40
Perfluoropentanoic acid (PFPeA)	µg/L	0.01	0.04	<0.02	67	0.04	<0.01	120	0.31	0.31	0	0.31	0.52	**51**
Perfluorohexanoic acid (PFHxA)	µg/L	0.01	0.04	<0.02	67	0.04	<0.01	120	0.30	0.30	0	0.30	0.50	**50**
Perfluoroheptanoic acid (PFHpA)	µg/L	0.02	0.06	<0.02	100	0.06	<0.05	18	0.14	0.14	0	0.14	0.24	53
Perfluorooctanoic acid (PFOA)	µg/L	0.01	<0.01	<0.01	0	<0.01	0.01	0	0.18	0.18	0	0.18	0.30	**50**
Perfluorononanoic acid (PFNA)	µg/L	0.01	<0.02	<0.02	0	<0.02	<0.01	0	0.03	0.04	29	0.03	0.06	67
Perfluorodecanoic acid (PFDA)	µg/L	0.01	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0
Perfluoroundecanoic acid (PFUnDA)	µg/L	0.01	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0
Perfluorododecanoic acid (PFDoDA)	µg/L	0.01	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0
Perfluorotridecanoic acid (PFTrDA)	µg/L	0.01	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0
Perfluorotetradecanoic acid (PFTeDA)	µg/L	0.01	<0.05	<0.05	0	<0.05	<0.01	0	<0.05	<0.05	0	<0.05	<0.01	0
PFAS - (n:2) Fluorotelomer Sulfonic Acids															
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	µg/L	0.01	<0.05	<0.05	0	<0.05	<0.01	0	<0.05	<0.05	0	<0.05	<0.01	0
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	µg/L	0.05	<0.05	<0.05	0	<0.05	<0.05	0	0.06	0.06	0	0.06	0.12	67
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	µg/L	0.01	<0.05	<0.05	0	<0.05	<0.01	0	<0.05	<0.05	0	<0.05	<0.01	0
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	µg/L	0.01	<0.05	<0.05	0	<0.05	<0.01	0	<0.05	<0.05	0	<0.05	<0.01	0
PFAS - Perfluoroalkyl Sulfonamides															
Perfluorooctane sulfonamide (FOSA)	µg/L	0.02	<0.02	<0.02	0	<0.02	<0.05	0	<0.02	<0.02	0	<0.02	<0.05	0
N-Methyl perfluorooctane sulfonamide (MeFOSA)	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 sulfonamidoacetic acid (MeFOSAA)	µg/L	0.02	<0.02	<0.02	0	<0.02	<0.05	0	<0.02	<0.02	0	<0.02	<0.05	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
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	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-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	µg/L	0.02	<0.02	<0.02	0	<0.02	<0.05	0	<0.02	<0.02	0	<0.02	<0.05	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
PFAS															
Sum of PFHxS and PFOS	µg/L	0.01	0.01	0.02	67	0.01	0.06	143	7.20	7.73	7	7.20	16.3	**77**
Sum of PFAS (WA DER List)	µg/L	0.01	0.15	0.02	**153**	0.15	0.07	**73**	8.37	8.90	6	8.37	18.25	**74**
Sum of PFAS	µg/L	0.01	0.15	0.02	**153**	0.15	<0.1	40	8.92	9.47	6	8.92	19.52	**75**

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

			Date	27 May 2024	27 May 2024		27 May 2024	27 May 2024		27 May 2024	27 May 2024		27 May 2024	27 May 2024	
			Field ID	0089_MW195S_240527	0089_QC103_240527		0089_MW195S_240527	0089_QC203_240527		0089_MW193_240527	0089_QC105_240527		0089_MW193_240527	0089_QC205_240527	
			Matrix Type	Water	Water		Water	Water		Water	Water		Water	Water	
			Lab Report Number	EP2407273	EP2407273	RPD	EP2407273	1102636	RPD	EP2407273	EP2407273	RPD	EP2407273	1102636	RPD
	Unit	LOR													
PFAS - Perfluoroalkyl Sulfonic Acids															
Perfluorobutane sulfonic acid (PFBS)	µg/L	0.01	<0.02	<0.02	0	<0.02	<0.01	0	0.73	0.75	3	0.73	1.2	**49**
Perfluoropentane sulfonic acid (PFPeS)	µg/L	0.01	<0.02	<0.02	0	<0.02	<0.01	0	0.90	0.94	4	0.90	1.8	**67**
Perfluorohexane sulfonic acid (PFHxS)	µg/L	0.01	<0.01	<0.01	0	<0.01	0.03	100	10.4	10.9	5	10.4	21	**68**
Perfluoroheptane sulfonic acid (PFHpS)	µg/L	0.01	<0.02	<0.02	0	<0.02	<0.01	0	0.81	0.81	0	0.81	1.3	**46**
Perfluorooctane sulfonic acid (PFOS)	µg/L	0.01	<0.01	<0.01	0	<0.01	0.03	100	3.78	3.63	4	3.78	6.1	**47**
Perfluorononanesulfonic acid (PFNS)	µg/L	0.01					<0.01						<0.01	
Perfluorodecane sulfonic acid (PFDS)	µg/L	0.01	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0
PFAS - Perfluoroalkyl Carboxylic Acids															
Perfluorobutanoic acid (PFBA)	µg/L	0.05	<0.1	<0.1	0	<0.1	<0.05	0	0.2	0.2	0	0.2	0.30	40
Perfluoropentanoic acid (PFPeA)	µg/L	0.01	<0.02	<0.02	0	<0.02	<0.01	0	0.38	0.40	5	0.38	0.69	**58**
Perfluorohexanoic acid (PFHxA)	µg/L	0.01	<0.02	<0.02	0	<0.02	<0.01	0	1.70	1.80	6	1.70	3.3	**64**
Perfluoroheptanoic acid (PFHpA)	µg/L	0.02	<0.02	<0.02	0	<0.02	<0.05	0	0.27	0.29	7	0.27	0.40	39
Perfluorooctanoic acid (PFOA)	µg/L	0.01	<0.01	<0.01	0	<0.01	0.01	0	0.64	0.71	10	0.64	1.6	**86**
Perfluorononanoic acid (PFNA)	µg/L	0.01	<0.02	<0.02	0	<0.02	<0.01	0	0.04	0.04	0	0.04	0.06	40
Perfluorodecanoic acid (PFDA)	µg/L	0.01	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0
Perfluoroundecanoic acid (PFUnDA)	µg/L	0.01	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0
Perfluorododecanoic acid (PFDoDA)	µg/L	0.01	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0
Perfluorotridecanoic acid (PFTrDA)	µg/L	0.01	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0
Perfluorotetradecanoic acid (PFTeDA)	µg/L	0.01	<0.05	<0.05	0	<0.05	<0.01	0	<0.05	<0.05	0	<0.05	<0.01	0
PFAS - (n:2) Fluorotelomer Sulfonic Acids															
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	µg/L	0.01	<0.05	<0.05	0	<0.05	<0.01	0	<0.05	<0.05	0	<0.05	<0.01	0
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	µg/L	0.05	<0.05	<0.05	0	<0.05	0.14	95	<0.05	<0.05	0	<0.05	0.23	129
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	µg/L	0.01	<0.05	<0.05	0	<0.05	<0.01	0	<0.05	<0.05	0	<0.05	<0.01	0
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	µg/L	0.01	<0.05	<0.05	0	<0.05	<0.01	0	<0.05	<0.05	0	<0.05	<0.01	0
PFAS - Perfluoroalkyl Sulfonamides															
Perfluorooctane sulfonamide (FOSA)	µg/L	0.02	<0.02	<0.02	0	<0.02	<0.05	0	<0.02	<0.02	0	<0.02	<0.05	0
N-Methyl perfluorooctane sulfonamide (MeFOSA)	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 sulfonamidoacetic acid (MeFOSAA)	µg/L	0.02	<0.02	<0.02	0	<0.02	<0.05	0	<0.02	<0.02	0	<0.02	<0.05	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
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	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-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	µg/L	0.02	<0.02	<0.02	0	<0.02	<0.05	0	<0.02	<0.02	0	<0.02	<0.05	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
PFAS															
Sum of PFHxS and PFOS	µg/L	0.01	<0.01	<0.01	0	<0.01	0.06	143	14.2	14.5	2	14.2	27.1	**62**
Sum of PFAS (WA DER List)	µg/L	0.01	<0.01	<0.01	0	<0.01	0.21	182	18.1	18.7	3	18.1	34.82	**63**
Sum of PFAS	µg/L	0.01	<0.01	<0.01	0	<0.01	0.21	182	19.8	20.5	3	19.8	38.55	**64**

			Date	27 May 2024	27 May 2024		27 May 2024	27 May 2024		28 May 2024	28 May 2024		28 May 2024	28 May 2024	
			Field ID	0089_MW172_240527	0089_QC104_240527		0089_MW172_240527	0089_QC204_240527		0089_MW228_240528	0089_QC106_240528		0089_MW228_240528	0089_QC206_240528	
			Matrix Type	Water	Water		Water	Water		Water	Water		Water	Water	
			Lab Report Number	EP2407306	EP2407306	RPD	EP2407306	1102636	RPD	EP2407411	EP2407411	RPD	EP2407411	1102636	RPD
	Unit	LOR													
PFAS - Perfluoroalkyl Sulfonic Acids															
Perfluorobutane sulfonic acid (PFBS)	µg/L	0.01		1.43	1.15	**22**	1.43	2.0	**33**	0.28	0.32	13	0.28	0.32	13
Perfluoropentane sulfonic acid (PFPeS)	µg/L	0.01		0.97	0.74	**27**	0.97	1.8	**60**	0.22	0.25	13	0.22	0.24	9
Perfluorohexane sulfonic acid (PFHxS)	µg/L	0.01		9.33	7.77	18	9.33	15	**47**	0.52	0.57	9	0.52	0.55	6
Perfluoroheptane sulfonic acid (PFHpS)	µg/L	0.01		2.21	1.90	15	2.21	3.3	**40**	<0.02	<0.02	0	<0.02	<0.01	0
Perfluorooctane sulfonic acid (PFOS)	µg/L	0.01		8.89	9.83	10	8.89	20	**77**	<0.01	<0.01	0	<0.01	<0.01	0
Perfluorononanesulfonic acid (PFNS)	µg/L	0.01						<0.01						<0.01	
Perfluorodecane sulfonic acid (PFDS)	µg/L	0.01		<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0
PFAS - Perfluoroalkyl Carboxylic Acids															
Perfluorobutanoic acid (PFBA)	µg/L	0.05		0.5	0.4	22	0.5	0.66	28	1.1	1.3	17	1.1	0.89	21
Perfluoropentanoic acid (PFPeA)	µg/L	0.01		0.60	0.46	**26**	0.60	0.82	**31**	4.75	5.52	15	4.75	5.4	13
Perfluorohexanoic acid (PFHxA)	µg/L	0.01		2.56	1.96	**27**	2.56	3.5	**31**	4.38	4.80	9	4.38	4.3	2
Perfluoroheptanoic acid (PFHpA)	µg/L	0.02		0.25	0.20	22	0.25	0.35	33	1.14	1.26	10	1.14	1.2	5
Perfluorooctanoic acid (PFOA)	µg/L	0.01		0.65	0.53	20	0.65	1.0	**42**	0.25	0.29	15	0.25	0.25	0
Perfluorononanoic acid (PFNA)	µg/L	0.01		<0.02	<0.02	0	<0.02	0.01	0	<0.02	<0.02	0	<0.02	<0.01	0
Perfluorodecanoic acid (PFDA)	µg/L	0.01		<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0
Perfluoroundecanoic acid (PFUnDA)	µg/L	0.01		<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0
Perfluorododecanoic acid (PFDoDA)	µg/L	0.01		<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0
Perfluorotridecanoic acid (PFTrDA)	µg/L	0.01		<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0
Perfluorotetradecanoic acid (PFTeDA)	µg/L	0.01		<0.05	<0.05	0	<0.05	<0.01	0	<0.05	<0.05	0	<0.05	<0.01	0
PFAS - (n:2) Fluorotelomer Sulfonic Acids															
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	µg/L	0.01		<0.05	<0.05	0	<0.05	<0.01	0	<0.05	<0.05	0	<0.05	<0.01	0
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	µg/L	0.05		<0.05	<0.05	0	<0.05	0.07	33	0.59	0.72	20	0.59	0.76	25
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	µg/L	0.01		<0.05	<0.05	0	<0.05	<0.01	0	<0.05	<0.05	0	<0.05	<0.01	0
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	µg/L	0.01		<0.05	<0.05	0	<0.05	<0.01	0	<0.05	<0.05	0	<0.05	<0.01	0
PFAS - Perfluoroalkyl Sulfonamides															
Perfluorooctane sulfonamide (FOSA)	µg/L	0.02		<0.02	<0.02	0	<0.02	<0.05	0	<0.02	<0.02	0	<0.02	<0.05	0
N-Methyl perfluorooctane sulfonamide (MeFOSA)	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 sulfonamidoacetic acid (MeFOSAA)	µg/L	0.02		<0.02	<0.02	0	<0.02	<0.05	0	<0.02	<0.02	0	<0.02	<0.05	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
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	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-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	µg/L	0.02		<0.02	<0.02	0	<0.02	<0.05	0	<0.02	<0.02	0	<0.02	<0.05	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
PFAS															
Sum of PFHxS and PFOS	µg/L	0.01		18.2	17.6	3	18.2	35	**63**	0.52	0.57	9	0.52	0.55	6
Sum of PFAS (WA DER List)	µg/L	0.01		24.2	22.3	8	24.2	43.4	**57**	13.0	14.8	13	13.0	13.67	5
Sum of PFAS	µg/L	0.01		27.4	24.9	10	27.4	50.11	**59**	13.2	15.0	13	13.2	14.02	6

			Date	28 May 2024	28 May 2024		28 May 2024	28 May 2024		28 May 2024	28 May 2024		28 May 2024	28 May 2024	
			Field ID	0089_MW139_240528	0089_QC108_240528		0089_MW139_240528	0089_QC208_240528		0089_SW408_240528	0089_QC109_240528		0089_SW408_240528	0089_QC209_240528	
			Matrix Type	Water	Water		Water	Water		Water	Water		Water	Water	
			Lab Report Number	EP2407335	EP2407335	RPD	EP2407335	1102636	RPD	EP2407413	EP2407413	RPD	EP2407413	1102636	RPD
	Unit	LOR													
PFAS - Perfluoroalkyl Sulfonic Acids															
Perfluorobutane sulfonic acid (PFBS)	µg/L	0.01	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0
Perfluoropentane sulfonic acid (PFPeS)	µg/L	0.01	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<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
Perfluoroheptane sulfonic acid (PFHpS)	µg/L	0.01	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0
Perfluorooctane sulfonic acid (PFOS)	µg/L	0.01	<0.01	<0.01	0	<0.01	<0.01	0	<0.01	<0.01	0	<0.01	<0.01	0
Perfluorononanesulfonic acid (PFNS)	µg/L	0.01					<0.01						<0.01		
Perfluorodecane sulfonic acid (PFDS)	µg/L	0.01	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0
PFAS - Perfluoroalkyl Carboxylic Acids															
Perfluorobutanoic acid (PFBA)	µg/L	0.05	<0.1	<0.1	0	<0.1	<0.05	0	<0.1	<0.1	0	<0.1	<0.05	0
Perfluoropentanoic acid (PFPeA)	µg/L	0.01	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0
Perfluorohexanoic acid (PFHxA)	µg/L	0.01	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0
Perfluoroheptanoic acid (PFHpA)	µg/L	0.02	<0.02	<0.02	0	<0.02	<0.05	0	<0.02	<0.02	0	<0.02	<0.05	0
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
Perfluorononanoic acid (PFNA)	µg/L	0.01	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0
Perfluorodecanoic acid (PFDA)	µg/L	0.01	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0
Perfluoroundecanoic acid (PFUnDA)	µg/L	0.01	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0
Perfluorododecanoic acid (PFDoDA)	µg/L	0.01	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0
Perfluorotridecanoic acid (PFTrDA)	µg/L	0.01	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0
Perfluorotetradecanoic acid (PFTeDA)	µg/L	0.01	<0.05	<0.05	0	<0.05	<0.01	0	<0.05	<0.05	0	<0.05	<0.01	0
PFAS - (n:2) Fluorotelomer Sulfonic Acids															
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	µg/L	0.01	<0.05	<0.05	0	<0.05	<0.01	0	<0.05	<0.05	0	<0.05	<0.01	0
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	µg/L	0.05	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	µg/L	0.01	<0.05	<0.05	0	<0.05	<0.01	0	<0.05	<0.05	0	<0.05	<0.01	0
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	µg/L	0.01	<0.05	<0.05	0	<0.05	<0.01	0	<0.05	<0.05	0	<0.05	<0.01	0
PFAS - Perfluoroalkyl Sulfonamides															
Perfluorooctane sulfonamide (FOSA)	µg/L	0.02	<0.02	<0.02	0	<0.02	<0.05	0	<0.02	<0.02	0	<0.02	<0.05	0
N-Methyl perfluorooctane sulfonamide (MeFOSA)	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 sulfonamidoacetic acid (MeFOSAA)	µg/L	0.02	<0.02	<0.02	0	<0.02	<0.05	0	<0.02	<0.02	0	<0.02	<0.05	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
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	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-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	µg/L	0.02	<0.02	<0.02	0	<0.02	<0.05	0	<0.02	<0.02	0	<0.02	<0.05	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
PFAS															
Sum of PFHxS and PFOS	µg/L	0.01	<0.01	<0.01	0	<0.01	<0.01	0	<0.01	<0.01	0	<0.01	<0.01	0
Sum of PFAS (WA DER List)	µg/L	0.01	<0.01	<0.01	0	<0.01	<0.05	0	<0.01	<0.01	0	<0.01	<0.05	0
Sum of PFAS	µg/L	0.01	<0.01	<0.01	0	<0.01	<0.1	0	<0.01	<0.01	0	<0.01	<0.1	0

			Date	28 May 2024	28 May 2024		28 May 2024	28 May 2024		28 May 2024	28 May 2024		28 May 2024	28 May 2024	
			Field ID	0089_SW156_240528	0089_QC113_240528		0089_SW156_240528	0089_QC213_240528		0089_SW150_240528	0089_QC112_240528		0089_SW150_240528	0089_QC212_240528	
			Matrix Type	Water	Water		Water	Water		Water	Water		Water	Water	
			Lab Report Number	EP2407337	EP2407337	RPD	EP2407337	1102636	RPD	EP2407337	EP2407337	RPD	EP2407337	1102636	RPD
	Unit	LOR													
PFAS - Perfluoroalkyl Sulfonic Acids															
Perfluorobutane sulfonic acid (PFBS)	µg/L	0.01	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0
Perfluoropentane sulfonic acid (PFPeS)	µg/L	0.01	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<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
Perfluoroheptane sulfonic acid (PFHpS)	µg/L	0.01	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0
Perfluorooctane sulfonic acid (PFOS)	µg/L	0.01	<0.01	<0.01	0	<0.01	<0.01	0	<0.01	<0.01	0	<0.01	<0.01	0
Perfluorononanesulfonic acid (PFNS)	µg/L	0.01					<0.01						<0.01		
Perfluorodecane sulfonic acid (PFDS)	µg/L	0.01	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0
PFAS - Perfluoroalkyl Carboxylic Acids															
Perfluorobutanoic acid (PFBA)	µg/L	0.05	<0.1	<0.1	0	<0.1	<0.05	0	<0.1	<0.1	0	<0.1	<0.05	0
Perfluoropentanoic acid (PFPeA)	µg/L	0.01	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0
Perfluorohexanoic acid (PFHxA)	µg/L	0.01	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0
Perfluoroheptanoic acid (PFHpA)	µg/L	0.02	<0.02	<0.02	0	<0.02	<0.05	0	<0.02	<0.02	0	<0.02	<0.05	0
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
Perfluorononanoic acid (PFNA)	µg/L	0.01	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0
Perfluorodecanoic acid (PFDA)	µg/L	0.01	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0
Perfluoroundecanoic acid (PFUnDA)	µg/L	0.01	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0
Perfluorododecanoic acid (PFDoDA)	µg/L	0.01	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0
Perfluorotridecanoic acid (PFTrDA)	µg/L	0.01	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0
Perfluorotetradecanoic acid (PFTeDA)	µg/L	0.01	<0.05	<0.05	0	<0.05	<0.01	0	<0.05	<0.05	0	<0.05	<0.01	0
PFAS - (n:2) Fluorotelomer Sulfonic Acids															
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	µg/L	0.01	<0.05	<0.05	0	<0.05	<0.01	0	<0.05	<0.05	0	<0.05	<0.01	0
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	µg/L	0.05	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	µg/L	0.01	<0.05	<0.05	0	<0.05	<0.01	0	<0.05	<0.05	0	<0.05	<0.01	0
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	µg/L	0.01	<0.05	<0.05	0	<0.05	<0.01	0	<0.05	<0.05	0	<0.05	<0.01	0
PFAS - Perfluoroalkyl Sulfonamides															
Perfluorooctane sulfonamide (FOSA)	µg/L	0.02	<0.02	<0.02	0	<0.02	<0.05	0	<0.02	<0.02	0	<0.02	<0.05	0
N-Methyl perfluorooctane sulfonamide (MeFOSA)	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 sulfonamidoacetic acid (MeFOSAA)	µg/L	0.02	<0.02	<0.02	0	<0.02	<0.05	0	<0.02	<0.02	0	<0.02	<0.05	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
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	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-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	µg/L	0.02	<0.02	<0.02	0	<0.02	<0.05	0	<0.02	<0.02	0	<0.02	<0.05	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
PFAS															
Sum of PFHxS and PFOS	µg/L	0.01	<0.01	<0.01	0	<0.01	<0.01	0	<0.01	<0.01	0	<0.01	<0.01	0
Sum of PFAS (WA DER List)	µg/L	0.01	<0.01	<0.01	0	<0.01	<0.05	0	<0.01	<0.01	0	<0.01	<0.05	0
Sum of PFAS	µg/L	0.01	<0.01	<0.01	0	<0.01	<0.1	0	<0.01	<0.01	0	<0.01	<0.1	0

			Date	28 May 2024	28 May 2024		28 May 2024	28 May 2024		28 May 2024	28 May 2024		28 May 2024	28 May 2024	
			Field ID	0089_PW329_240528	0089_QC115_240528		0089_PW329_240528	0089_QC215_240528		0089_PW356_240528	0089_QC114_240528		0089_PW356_240528	0089_QC214_240528	
			Matrix Type	Water	Water		Water	Water		Water	Water		Water	Water	
			Lab Report Number	EP2407337	EP2407337	RPD	EP2407337	1102636	RPD	EP2407337	EP2407337	RPD	EP2407337	1102636	RPD
	Unit	LOR													
PFAS - Perfluoroalkyl Sulfonic Acids															
Perfluorobutane sulfonic acid (PFBS)	µg/L	0.01	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0
Perfluoropentane sulfonic acid (PFPeS)	µg/L	0.01	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<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
Perfluoroheptane sulfonic acid (PFHpS)	µg/L	0.01	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0
Perfluorooctane sulfonic acid (PFOS)	µg/L	0.01	<0.01	<0.01	0	<0.01	<0.01	0	0.02	0.02	0	0.02	<0.01	67
Perfluorononanesulfonic acid (PFNS)	µg/L	0.01					<0.01						<0.01		
Perfluorodecane sulfonic acid (PFDS)	µg/L	0.01	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0
PFAS - Perfluoroalkyl Carboxylic Acids															
Perfluorobutanoic acid (PFBA)	µg/L	0.05	<0.1	<0.1	0	<0.1	<0.05	0	<0.1	<0.1	0	<0.1	<0.05	0
Perfluoropentanoic acid (PFPeA)	µg/L	0.01	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0
Perfluorohexanoic acid (PFHxA)	µg/L	0.01	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0
Perfluoroheptanoic acid (PFHpA)	µg/L	0.02	<0.02	<0.02	0	<0.02	<0.05	0	<0.02	<0.02	0	<0.02	<0.05	0
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
Perfluorononanoic acid (PFNA)	µg/L	0.01	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0
Perfluorodecanoic acid (PFDA)	µg/L	0.01	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0
Perfluoroundecanoic acid (PFUnDA)	µg/L	0.01	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0
Perfluorododecanoic acid (PFDoDA)	µg/L	0.01	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0
Perfluorotridecanoic acid (PFTrDA)	µg/L	0.01	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0
Perfluorotetradecanoic acid (PFTeDA)	µg/L	0.01	<0.05	<0.05	0	<0.05	<0.01	0	<0.05	<0.05	0	<0.05	<0.01	0
PFAS - (n:2) Fluorotelomer Sulfonic Acids															
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	µg/L	0.01	<0.05	<0.05	0	<0.05	<0.01	0	<0.05	<0.05	0	<0.05	<0.01	0
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	µg/L	0.05	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	µg/L	0.01	<0.05	<0.05	0	<0.05	<0.01	0	<0.05	<0.05	0	<0.05	<0.01	0
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	µg/L	0.01	<0.05	<0.05	0	<0.05	<0.01	0	<0.05	<0.05	0	<0.05	<0.01	0
PFAS - Perfluoroalkyl Sulfonamides															
Perfluorooctane sulfonamide (FOSA)	µg/L	0.02	<0.02	<0.02	0	<0.02	<0.05	0	<0.02	<0.02	0	<0.02	<0.05	0
N-Methyl perfluorooctane sulfonamide (MeFOSA)	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 sulfonamidoacetic acid (MeFOSAA)	µg/L	0.02	<0.02	<0.02	0	<0.02	<0.05	0	<0.02	<0.02	0	<0.02	<0.05	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
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	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-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	µg/L	0.02	<0.02	<0.02	0	<0.02	<0.05	0	<0.02	<0.02	0	<0.02	<0.05	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
PFAS															
Sum of PFHxS and PFOS	µg/L	0.01	<0.01	<0.01	0	<0.01	<0.01	0	0.02	0.02	0	0.02	<0.01	67
Sum of PFAS (WA DER List)	µg/L	0.01	<0.01	<0.01	0	<0.01	<0.05	0	0.02	0.02	0	0.02	<0.05	0
Sum of PFAS	µg/L	0.01	<0.01	<0.01	0	<0.01	<0.1	0	0.02	0.02	0	0.02	<0.1	0

			Date	28 May 2024	28 May 2024		28 May 2024	28 May 2024		28 May 2024	28 May 2024		28 May 2024	28 May 2024	
			Field ID	0089_PW307_240528	0089_QC111_240528		0089_PW307_240528	0089_QC211_240528		0089_PW411_240528	0089_QC116_240528		0089_PW411_240528	0089_QC216_240528	
			Matrix Type	Water	Water		Water	Water		Water	Water		Water	Water	
			Lab Report Number	EP2407316	EP2407316	RPD	EP2407316	1102636	RPD	EP2407316	EP2407316	RPD	EP2407316	1102636	RPD
	Unit	LOR													
PFAS - Perfluoroalkyl Sulfonic Acids															
Perfluorobutane sulfonic acid (PFBS)	µg/L	0.01		<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0
Perfluoropentane sulfonic acid (PFPeS)	µg/L	0.01		<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<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
Perfluoroheptane sulfonic acid (PFHpS)	µg/L	0.01		<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0
Perfluorooctane sulfonic acid (PFOS)	µg/L	0.01		0.01	<0.01	0	0.01	<0.01	0	<0.01	<0.01	0	<0.01	<0.01	0
Perfluorononanesulfonic acid (PFNS)	µg/L	0.01						<0.01						<0.01	
Perfluorodecane sulfonic acid (PFDS)	µg/L	0.01		<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0
PFAS - Perfluoroalkyl Carboxylic Acids															
Perfluorobutanoic acid (PFBA)	µg/L	0.05		<0.1	<0.1	0	<0.1	<0.05	0	<0.1	<0.1	0	<0.1	<0.05	0
Perfluoropentanoic acid (PFPeA)	µg/L	0.01		<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0
Perfluorohexanoic acid (PFHxA)	µg/L	0.01		<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0
Perfluoroheptanoic acid (PFHpA)	µg/L	0.02		<0.02	<0.02	0	<0.02	<0.05	0	<0.02	<0.02	0	<0.02	<0.05	0
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
Perfluorononanoic acid (PFNA)	µg/L	0.01		<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0
Perfluorodecanoic acid (PFDA)	µg/L	0.01		<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0
Perfluoroundecanoic acid (PFUnDA)	µg/L	0.01		<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0
Perfluorododecanoic acid (PFDoDA)	µg/L	0.01		<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0
Perfluorotridecanoic acid (PFTrDA)	µg/L	0.01		<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0
Perfluorotetradecanoic acid (PFTeDA)	µg/L	0.01		<0.05	<0.05	0	<0.05	<0.01	0	<0.05	<0.05	0	<0.05	<0.01	0
PFAS - (n:2) Fluorotelomer Sulfonic Acids															
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	µg/L	0.01		<0.05	<0.05	0	<0.05	<0.01	0	<0.05	<0.05	0	<0.05	<0.01	0
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	µg/L	0.05		<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	µg/L	0.01		<0.05	<0.05	0	<0.05	<0.01	0	<0.05	<0.05	0	<0.05	<0.01	0
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	µg/L	0.01		<0.05	<0.05	0	<0.05	<0.01	0	<0.05	<0.05	0	<0.05	<0.01	0
PFAS - Perfluoroalkyl Sulfonamides															
Perfluorooctane sulfonamide (FOSA)	µg/L	0.02		<0.02	<0.02	0	<0.02	<0.05	0	<0.02	<0.02	0	<0.02	<0.05	0
N-Methyl perfluorooctane sulfonamide (MeFOSA)	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 sulfonamidoacetic acid (MeFOSAA)	µg/L	0.02		<0.02	<0.02	0	<0.02	<0.05	0	<0.02	<0.02	0	<0.02	<0.05	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
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	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-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	µg/L	0.02		<0.02	<0.02	0	<0.02	<0.05	0	<0.02	<0.02	0	<0.02	<0.05	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
PFAS															
Sum of PFHxS and PFOS	µg/L	0.01		0.01	<0.01	0	0.01	<0.01	0	<0.01	<0.01	0	<0.01	<0.01	0
Sum of PFAS (WA DER List)	µg/L	0.01		0.01	<0.01	0	0.01	<0.05	0	<0.01	<0.01	0	<0.01	<0.05	0
Sum of PFAS	µg/L	0.01		0.01	<0.01	0	0.01	<0.1	0	<0.01	<0.01	0	<0.01	<0.1	0

			Date	28 May 2024	28 May 2024		28 May 2024	28 May 2024		28 May 2024	28 May 2024		28 May 2024	28 May 2024	
			Field ID	0089_SD405_240528	0089_QC107_240528		0089_SD405_240528	0089_QC207_240528		0089_SD307_240528	0089_QC110_240528		0089_SD307_240528	0089_QC210_240528	
			Matrix Type	Soil	Soil		Soil	Soil		Soil	Soil		Soil	Soil	
			Lab Report Number	EP2407412	EP2407412	RPD	EP2407412	1102636	RPD	EP2407314	EP2407314	RPD	EP2407314	1102636	RPD
	Unit	LOR													
PFAS - Perfluoroalkyl Sulfonic Acids															
Perfluorobutane sulfonic acid (PFBS)	mg/kg	0.0002		<0.0002	<0.0002	0	<0.0002	<0.005	0	<0.0002	<0.0002	0	<0.0002	<0.005	0
Perfluoropentane sulfonic acid (PFPeS)	mg/kg	0.0002		<0.0002	<0.0002	0	<0.0002	<0.005	0	<0.0002	<0.0002	0	<0.0002	<0.005	0
Perfluorohexane sulfonic acid (PFHxS)	mg/kg	0.0002		<0.0002	<0.0002	0	<0.0002	<0.005	0	<0.0002	<0.0002	0	<0.0002	<0.005	0
Perfluoroheptane sulfonic acid (PFHpS)	mg/kg	0.0002		<0.0002	<0.0002	0	<0.0002	<0.005	0	<0.0002	<0.0002	0	<0.0002	<0.005	0
Perfluorooctane sulfonic acid (PFOS)	mg/kg	0.0002		<0.0002	<0.0002	0	<0.0002	<0.005	0	<0.0002	<0.0002	0	<0.0002	<0.005	0
Perfluorononanesulfonic acid (PFNS)	mg/kg	0.005						<0.005						<0.005	
Perfluorodecane sulfonic acid (PFDS)	mg/kg	0.0002		<0.0002	<0.0002	0	<0.0002	<0.005	0	<0.0002	<0.0002	0	<0.0002	<0.005	0
PFAS - Perfluoroalkyl Carboxylic Acids															
Perfluorobutanoic acid (PFBA)	mg/kg	0.001		<0.001	<0.001	0	<0.001	<0.005	0	<0.001	<0.001	0	<0.001	<0.005	0
Perfluoropentanoic acid (PFPeA)	mg/kg	0.0002		<0.0002	<0.0002	0	<0.0002	<0.005	0	<0.0002	<0.0002	0	<0.0002	<0.005	0
Perfluorohexanoic acid (PFHxA)	mg/kg	0.0002		<0.0002	<0.0002	0	<0.0002	<0.005	0	<0.0002	<0.0002	0	<0.0002	<0.005	0
Perfluoroheptanoic acid (PFHpA)	mg/kg	0.0002		<0.0002	<0.0002	0	<0.0002	<0.005	0	<0.0002	<0.0002	0	<0.0002	<0.005	0
Perfluorooctanoic acid (PFOA)	mg/kg	0.0002		<0.0002	<0.0002	0	<0.0002	<0.005	0	<0.0002	<0.0002	0	<0.0002	<0.005	0
Perfluorononanoic acid (PFNA)	mg/kg	0.0002		<0.0002	<0.0002	0	<0.0002	<0.005	0	<0.0002	<0.0002	0	<0.0002	<0.005	0
Perfluorodecanoic acid (PFDA)	mg/kg	0.0002		<0.0002	<0.0002	0	<0.0002	<0.005	0	<0.0002	<0.0002	0	<0.0002	<0.005	0
Perfluoroundecanoic acid (PFUnDA)	mg/kg	0.0002		<0.0002	<0.0002	0	<0.0002	<0.005	0	<0.0002	<0.0002	0	<0.0002	<0.005	0
Perfluorododecanoic acid (PFDoDA)	mg/kg	0.0002		<0.0002	<0.0002	0	<0.0002	<0.005	0	<0.0002	<0.0002	0	<0.0002	<0.005	0
Perfluorotridecanoic acid (PFTrDA)	mg/kg	0.0002		<0.0002	<0.0002	0	<0.0002	<0.005	0	<0.0002	<0.0002	0	<0.0002	<0.005	0
Perfluorotetradecanoic acid (PFTeDA)	mg/kg	0.0005		<0.0005	<0.0005	0	<0.0005	<0.005	0	<0.0005	<0.0005	0	<0.0005	<0.005	0
PFAS - (n:2) Fluorotelomer Sulfonic Acids															
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	mg/kg	0.0005		<0.0005	<0.0005	0	<0.0005	<0.005	0	<0.0005	<0.0005	0	<0.0005	<0.005	0
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	mg/kg	0.0005		<0.0005	<0.0005	0	<0.0005	<0.01	0	<0.0005	<0.0005	0	<0.0005	<0.01	0
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	mg/kg	0.0005		<0.0005	<0.0005	0	<0.0005	<0.005	0	<0.0005	<0.0005	0	<0.0005	<0.005	0
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	mg/kg	0.0005		<0.0005	<0.0005	0	<0.0005	<0.005	0	<0.0005	<0.0005	0	<0.0005	<0.005	0
PFAS - Perfluoroalkyl Sulfonamides															
Perfluorooctane sulfonamide (FOSA)	mg/kg	0.0002		<0.0002	<0.0002	0	<0.0002	<0.005	0	<0.0002	<0.0002	0	<0.0002	<0.005	0
N-Methyl perfluorooctane sulfonamide (MeFOSA)	mg/kg	0.0005		<0.0005	<0.0005	0	<0.0005	<0.005	0	<0.0005	<0.0005	0	<0.0005	<0.005	0
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	mg/kg	0.0002		<0.0002	<0.0002	0	<0.0002	<0.01	0	<0.0002	<0.0002	0	<0.0002	<0.01	0
N-methyl perfluorooctane sulfonamidoethanol (MeFOSE)	mg/kg	0.0005		<0.0005	<0.0005	0	<0.0005	<0.005	0	<0.0005	<0.0005	0	<0.0005	<0.005	0
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	mg/kg	0.0005		<0.0005	<0.0005	0	<0.0005	<0.005	0	<0.0005	<0.0005	0	<0.0005	<0.005	0
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	mg/kg	0.0002		<0.0002	<0.0002	0	<0.0002	<0.01	0	<0.0002	<0.0002	0	<0.0002	<0.01	0
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	mg/kg	0.0005		<0.0005	<0.0005	0	<0.0005	<0.005	0	<0.0005	<0.0005	0	<0.0005	<0.005	0
PFAS															
Sum of PFHxS and PFOS	mg/kg	0.0002		<0.0002	<0.0002	0	<0.0002	<0.005	0	<0.0002	<0.0002	0	<0.0002	<0.005	0
Sum of PFAS (WA DER List)	mg/kg	0.0002		<0.0002	<0.0002	0	<0.0002	<0.01	0	<0.0002	<0.0002	0	<0.0002	<0.01	0
Sum of PFAS	mg/kg	0.0002		<0.0002	<0.0002	0	<0.0002	<0.05	0	<0.0002	<0.0002	0	<0.0002	<0.05	0

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

Date			28 May 2024	28 May 2024		28 May 2024	28 May 2024		28 May 2024	28 May 2024		28 May 2024	28 May 2024	
Field ID			0089_SD411_240528	0089_QC117_240528		0089_SD411_240528	0089_QC217_240528		0089_SD413_240528	0089_QC118_240528		0089_SD413_240528	0089_QC218_240528	
Matrix Type			Soil	Soil		Soil	Soil		Soil	Soil		Soil	Soil	
Lab Report Number			EP2407314	EP2407314	RPD	EP2407314	1102636	RPD	EP2407314	EP2407314	RPD	EP2407314	1102636	RPD
	Unit	LOR												
PFAS - Perfluoroalkyl Sulfonic Acids														
Perfluorobutane sulfonic acid (PFBS)	mg/kg	0.0002	<0.0002	<0.0002	0	<0.0002	<0.005	0	<0.0002	<0.0002	0	<0.0002	<0.005	0
Perfluoropentane sulfonic acid (PFPeS)	mg/kg	0.0002	<0.0002	<0.0002	0	<0.0002	<0.005	0	<0.0002	<0.0002	0	<0.0002	<0.005	0
Perfluorohexane sulfonic acid (PFHxS)	mg/kg	0.0002	<0.0002	<0.0002	0	<0.0002	<0.005	0	<0.0002	<0.0002	0	<0.0002	<0.005	0
Perfluoroheptane sulfonic acid (PFHpS)	mg/kg	0.0002	<0.0002	<0.0002	0	<0.0002	<0.005	0	<0.0002	<0.0002	0	<0.0002	<0.005	0
Perfluorooctane sulfonic acid (PFOS)	mg/kg	0.0002	<0.0002	<0.0002	0	<0.0002	<0.005	0	<0.0002	<0.0002	0	<0.0002	<0.005	0
Perfluorononanesulfonic acid (PFNS)	mg/kg	0.005					<0.005						<0.005	
Perfluorodecane sulfonic acid (PFDS)	mg/kg	0.0002	<0.0002	<0.0002	0	<0.0002	<0.005	0	<0.0002	<0.0002	0	<0.0002	<0.005	0
PFAS - Perfluoroalkyl Carboxylic Acids														
Perfluorobutanoic acid (PFBA)	mg/kg	0.001	<0.001	<0.001	0	<0.001	<0.005	0	<0.001	<0.001	0	<0.001	<0.005	0
Perfluoropentanoic acid (PFPeA)	mg/kg	0.0002	<0.0002	<0.0002	0	<0.0002	<0.005	0	<0.0002	<0.0002	0	<0.0002	<0.005	0
Perfluorohexanoic acid (PFHxA)	mg/kg	0.0002	<0.0002	<0.0002	0	<0.0002	<0.005	0	<0.0002	<0.0002	0	<0.0002	<0.005	0
Perfluoroheptanoic acid (PFHpA)	mg/kg	0.0002	<0.0002	<0.0002	0	<0.0002	<0.005	0	<0.0002	<0.0002	0	<0.0002	<0.005	0
Perfluorooctanoic acid (PFOA)	mg/kg	0.0002	<0.0002	<0.0002	0	<0.0002	<0.005	0	<0.0002	<0.0002	0	<0.0002	<0.005	0
Perfluorononanoic acid (PFNA)	mg/kg	0.0002	<0.0002	<0.0002	0	<0.0002	<0.005	0	<0.0002	<0.0002	0	<0.0002	<0.005	0
Perfluorodecanoic acid (PFDA)	mg/kg	0.0002	<0.0002	<0.0002	0	<0.0002	<0.005	0	<0.0002	<0.0002	0	<0.0002	<0.005	0
Perfluoroundecanoic acid (PFUnDA)	mg/kg	0.0002	<0.0002	<0.0002	0	<0.0002	<0.005	0	<0.0002	<0.0002	0	<0.0002	<0.005	0
Perfluorododecanoic acid (PFDoDA)	mg/kg	0.0002	<0.0002	<0.0002	0	<0.0002	<0.005	0	<0.0002	<0.0002	0	<0.0002	<0.005	0
Perfluorotridecanoic acid (PFTrDA)	mg/kg	0.0002	<0.0002	<0.0002	0	<0.0002	<0.005	0	<0.0002	<0.0002	0	<0.0002	<0.005	0
Perfluorotetradecanoic acid (PFTeDA)	mg/kg	0.0005	<0.0005	<0.0005	0	<0.0005	<0.005	0	<0.0005	<0.0005	0	<0.0005	<0.005	0
PFAS - (n:2) Fluorotelomer Sulfonic Acids														
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	mg/kg	0.0005	<0.0005	<0.0005	0	<0.0005	<0.005	0	<0.0005	<0.0005	0	<0.0005	<0.005	0
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	mg/kg	0.0005	<0.0005	<0.0005	0	<0.0005	<0.01	0	<0.0005	<0.0005	0	<0.0005	<0.01	0
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	mg/kg	0.0005	<0.0005	<0.0005	0	<0.0005	<0.005	0	<0.0005	<0.0005	0	<0.0005	<0.005	0
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	mg/kg	0.0005	<0.0005	<0.0005	0	<0.0005	<0.005	0	<0.0005	<0.0005	0	<0.0005	<0.005	0
PFAS - Perfluoroalkyl Sulfonamides														
Perfluorooctane sulfonamide (FOSA)	mg/kg	0.0002	<0.0002	<0.0002	0	<0.0002	<0.005	0	<0.0002	<0.0002	0	<0.0002	<0.005	0
N-Methyl perfluorooctane sulfonamide (MeFOSA)	mg/kg	0.0005	<0.0005	<0.0005	0	<0.0005	<0.005	0	<0.0005	<0.0005	0	<0.0005	<0.005	0
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	mg/kg	0.0002	<0.0002	<0.0002	0	<0.0002	<0.01	0	<0.0002	<0.0002	0	<0.0002	<0.01	0
N-methyl perfluorooctane sulfonamidoethanol (MeFOSE)	mg/kg	0.0005	<0.0005	<0.0005	0	<0.0005	<0.005	0	<0.0005	<0.0005	0	<0.0005	<0.005	0
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	mg/kg	0.0005	<0.0005	<0.0005	0	<0.0005	<0.005	0	<0.0005	<0.0005	0	<0.0005	<0.005	0
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	mg/kg	0.0002	<0.0002	<0.0002	0	<0.0002	<0.01	0	<0.0002	<0.0002	0	<0.0002	<0.01	0
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	mg/kg	0.0005	<0.0005	<0.0005	0	<0.0005	<0.005	0	<0.0005	<0.0005	0	<0.0005	<0.005	0
PFAS														
Sum of PFHxS and PFOS	mg/kg	0.0002	<0.0002	<0.0002	0	<0.0002	<0.005	0	<0.0002	<0.0002	0	<0.0002	<0.005	0
Sum of PFAS (WA DER List)	mg/kg	0.0002	<0.0002	<0.0002	0	<0.0002	<0.01	0	<0.0002	<0.0002	0	<0.0002	<0.01	0
Sum of PFAS	mg/kg	0.0002	<0.0002	<0.0002	0	<0.0002	<0.05	0	<0.0002	<0.0002	0	<0.0002	<0.05	0

APPENDIX

C

LABORATORY CERTIFICATES

Cardno

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Stantec

ALSCompass
SAMPLING *Intelligence*

ALS

Environmental Division
Perth
Work Order Reference
EP2407272

Telephone : +61-8-9406 1301

Custody Document for Submissions via ALS Compass App

Project: WA-CO89-PPASOMP_24 Client: STANTEC Project Manager: [redacted]

Phone: ( )

ALS Compass COC Reference: 68225 68219 68227 68226 68220 # Samples: Sampler: [redacted]

Phone: ( )

Turnaround Requirements: Standard Urgent

Special Instructions:

Custody:

Relinquished by:	Received by:	Relinquished by:	Received by:
STANTEC	[redacted]		
Date / Time: 28/5/24	Date / Time: 29/5 1720	Date / Time:	Date / Time:

CHAIN OF CUSTODY

COC#: 68220 *ALS Laboratory:* EP Perth Environmental

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

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP_24

SITE: Stirling SW/PW - MB

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted] derp.labreports@esdat.com.au

EMAIL INVOICES 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	WA OMP Water Suite WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
001	0089_SW382		27/05/2024 02:43 PM	WATER	ALS: 3 Non ALS: 0	No	X		
002	0089_SW353		27/05/2024 02:44 PM	WATER	ALS: 3 Non ALS: 0	No	X		
003	0089_SW384		27/05/2024 02:45 PM	WATER	ALS: 3 Non ALS: 0	No	X		
004	0089_SW383		27/05/2024 02:45 PM	WATER	ALS: 3 Non ALS: 0	No	X		

CHAIN OF CUSTODY

COC#: 68220 *ALS Laboratory:* EP Perth Environmental

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

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP_24

SITE: Stirling SW/PW - MB

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted] derp.labreports@esdat.com.au

EMAIL INVOICES 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	0089_SW382	HDPE (no PTFE)	20 mL	00351221024773	Grey	No	
001	0089_SW382	HDPE (no PTFE)	20 mL	00351221024710	Grey	No	
001	0089_SW382	Clear Plastic Bottle - Natural	125 mL	00071121160999	Green	No	
002	0089_SW353	HDPE (no PTFE)	20 mL	00352312048632	Grey	No	
002	0089_SW353	HDPE (no PTFE)	20 mL	00351221024827	Grey	No	
002	0089_SW353	Clear Plastic Bottle - Natural	125 mL	00071121177918	Green	No	
003	0089_SW384	HDPE (no PTFE)	20 mL	00351221024694	Grey	No	
003	0089_SW384	HDPE (no PTFE)	20 mL	00351221024839	Grey	No	
003	0089_SW384	Clear Plastic Bottle - Natural	125 mL	00071121161002	Green	No	
004	0089_SW383	HDPE (no PTFE)	20 mL	00351221024641	Grey	No	
004	0089_SW383	HDPE (no PTFE)	20 mL	00351221024638	Grey	No	
004	0089_SW383	Clear Plastic Bottle - Natural	125 mL	00071121177964	Green	No	

Total Bottle Count: ALS: 12, Non ALS: 0

SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : **EP2407272**

Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: [redacted]
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
E-mail	: [redacted]stantec.com	E-mail	: [redacted]alsglobal.com
Telephone	: ----	Telephone	: +61-8-9406 1301
Facsimile	: ----	Facsimile	: +61-8-9406 1399
Project	: WA_0089_PFASOMP_24	Page	: 1 of 2
Order number	: pfas-omp/Stirling	Quote number	: ES2022MWHAUS0002 (SY/139/19 B)
C-O-C number	: 68220	QC Level	: NEPM 2013 B3 & ALS QC Standard
Site	: Stirling SW/PW - MB		
Sampler	: [redacted]		

Dates

Date Samples Received	: 28-May-2024 13:20	Issue Date	: 30-May-2024
Client Requested Due Date	: 10-Jun-2024	Scheduled Reporting Date	: **10-Jun-2024**

Delivery Details

Mode of Delivery	: Carrier	Security Seal	: Intact.
No. of coolers/boxes	: 1	Temperature	: 7.7 - Ice present
Receipt Detail	:	No. of samples received / analysed	: 4 / 4

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 see scanned COC for sample discrepencies: extra samples , samples not received etc.
- Please direct any queries related to sample condition / numbering / breakages to Sample Receipt (Samples.Perth@alsglobal.com)
- Analytical work for this work order will be conducted at ALS Environmental Perth.
- Please direct any turnaround / technical queries to the laboratory contact designated above.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months) from receipt of samples.
- **pH analysis should be conducted within 6 hours of sampling.**
- **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.**
- 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 (30 analytes)	WATER - NT-01 & 02 Ca, Mg, Na, K, Cl, SO4, Alkalinity
EP2407272-001	27-May-2024 14:43	0089_SW382_240527	✓	✓
EP2407272-002	27-May-2024 14:44	0089_SW353_240527	✓	✓
EP2407272-003	27-May-2024 14:45	0089_SW384_240527	✓	✓
EP2407272-004	27-May-2024 14:45	0089_SW383_240527	✓	✓

Proactive Holding Time Report

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

Requested Deliverables

[redacted]
- A4 - AU Tax Invoice (INV) — Email — [redacted]cardno.com.au

DERP LAB REPORTS
- EDI Format - ESDAT (ESDAT) — Email — derp.labreports@esdat.com.au

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

CERTIFICATE OF ANALYSIS

Work Order	: **EP2407272**	Page	: 1 of 6
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: [redacted]
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: +61-8-9406 1301
Project	: WA_0089_PFASOMP_24	Date Samples Received	: 28-May-2024 13:20
Order number	: pfas-omp/Stirling	Date Analysis Commenced	: 30-May-2024
C-O-C number	: 68220	Issue Date	: 10-Jun-2024 21:05
Sampler	: [redacted]		
Site	: Stirling SW/PW - MB		
Quote number	: SY/139/19 B		
No. of samples received	: 4		
No. of samples analysed	: 4		

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]	Laboratory Manager (Perth)	Perth Inorganics, Wangara, WA
[redacted]	Metals Chemist	Perth Inorganics, Wangara, WA
[redacted]	Senior Organic Chemist	Perth Organics, Wangara, WA

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.
- As per QWI – EN55-3 Data Interpreting Procedures, Ionic balances are typically calculated using Major Anions - Chloride, Alkalinity and Sulfate; and Major Cations - Calcium, Magnesium, Potassium and Sodium. Where applicable and dependent upon sample matrix, the Ionic Balance may also include the additional contribution of Ammonia, Dissolved Metals by ICPMS and H+ to the Cations and Nitrate, SiO2 and Fluoride to the Anions.
- Sodium Adsorption Ratio (where reported): Where results for Na, Ca or Mg are <LOR, a concentration at half the reported LOR is incorporated into the SAR calculation. This represents a conservative approach for Na relative to the assumption that <LOR = zero concentration and a conservative approach for Ca & Mg relative to the assumption that <LOR is equivalent to the LOR concentration.
- 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.
- ED045G: The presence of Thiocyanate, Thiosulfate and Sulfite can positively contribute to the chloride result, thereby may bias results higher than expected. Results should be scrutinised accordingly.

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_SW382_240527	0089_SW353_240527	0089_SW384_240527	0089_SW383_240527	----
				Sampling date / time	27-May-2024 14:43	27-May-2024 14:44	27-May-2024 14:45	27-May-2024 14:45	----
Compound	CAS Number	LOR	Unit		EP2407272-001	EP2407272-002	EP2407272-003	EP2407272-004	--------
					Result	Result	Result	Result	----
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	<1	<1	<1	----
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	<1	<1	<1	----
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		124	120	120	120	----
Total Alkalinity as CaCO3	----	1	mg/L		124	120	120	120	----
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		2610	2610	2490	2510	----
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		16900	17000	16900	16700	----
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		425	413	415	447	----
Magnesium	7439-95-4	1	mg/L		1410	1360	1370	1410	----
Sodium	7440-23-5	1	mg/L		11000	10600	10700	10600	----
Potassium	7440-09-7	1	mg/L		643	624	628	594	----
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		534	536	531	526	----
ø Total Cations	----	0.01	meq/L		632	610	615	615	----
ø Ionic Balance	----	0.01	%		8.46	6.40	7.33	7.79	----
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		<0.01	<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	----
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		<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	----

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_SW382_240527	0089_SW353_240527	0089_SW384_240527	0089_SW383_240527	----
				Sampling date / time	27-May-2024 14:43	27-May-2024 14:44	27-May-2024 14:45	27-May-2024 14:45	----
Compound	CAS Number	LOR	Unit		EP2407272-001	EP2407272-002	EP2407272-003	EP2407272-004	--------
					Result	Result	Result	Result	----
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		<0.02	<0.02	<0.02	<0.02	----
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
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	----
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									

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_SW382_240527	0089_SW353_240527	0089_SW384_240527	0089_SW383_240527	----
				Sampling date / time	27-May-2024 14:43	27-May-2024 14:44	27-May-2024 14:45	27-May-2024 14:45	----
Compound	CAS Number	LOR	Unit		EP2407272-001	EP2407272-002	EP2407272-003	EP2407272-004	--------
					Result	Result	Result	Result	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
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		<0.01	<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	----
Sum of PFAS (WA DER List)	----	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	----
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**92.7**	**95.1**	**99.0**	**96.0**	----
13C8-PFOA	----	0.02	%		**99.6**	**102**	**109**	**102**	----

Surrogate Control Limits

Sub-Matrix: SURFACE WATER		Recovery Limits (%)	
Compound	CAS Number	Low	High
EP231S: PFAS Surrogate			
13C4-PFOS	----	65	140
13C8-PFOA	----	71	133

QUALITY CONTROL REPORT

Work Order	: **EP2407272**	Page	: 1 of 9
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: [redacted]
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: +61-8-9406 1301
Project	: WA_0089_PFASOMP_24	Date Samples Received	: 28-May-2024
Order number	: pfas-omp/Stirling	Date Analysis Commenced	: 30-May-2024
C-O-C number	: 68220	Issue Date	: 10-Jun-2024
Sampler	: [redacted]		
Site	: Stirling SW/PW - MB		
Quote number	: SY/139/19 B		
No. of samples received	: 4		
No. of samples analysed	: 4		

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]	Laboratory Manager (Perth)	Perth Inorganics, Wangara, WA
[redacted]	Metals Chemist	Perth Inorganics, Wangara, WA
[redacted]	Senior Organic Chemist	Perth Organics, Wangara, WA

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 (%)
ED037P: Alkalinity by PC Titrator (QC Lot: 5828136)									
EP2407272-002	0089_SW353_240527	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	120	120	0.0	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	120	120	0.0	0% - 20%
EP2407273-007	Anonymous	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	359	358	0.0	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	359	358	0.0	0% - 20%
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QC Lot: 5827150)									
EP2407272-001	0089_SW382_240527	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	2610	2560	1.8	0% - 20%
EP2407384-003	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	36	36	0.0	0% - 20%
ED045G: Chloride by Discrete Analyser (QC Lot: 5827151)									
EP2407272-001	0089_SW382_240527	ED045G: Chloride	16887-00-6	1	mg/L	16900	15800	7.0	0% - 20%
EP2407384-003	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	106	107	0.0	0% - 20%
ED093F: Dissolved Major Cations (QC Lot: 5826269)									
EP2407272-001	0089_SW382_240527	ED093F: Calcium	7440-70-2	1	mg/L	425	410	3.7	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	1410	1360	3.7	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	11000	10600	4.0	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	643	620	3.7	0% - 20%
EP2407273-007	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	109	110	0.0	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	60	60	0.0	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	181	181	0.0	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 (%)*
ED093F: Dissolved Major Cations (QC Lot: 5826269) - continued									
EP2407273-007	Anonymous	ED093F: Potassium	7440-09-7	1	mg/L	13	13	0.0	0% - 50%
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 5834859)									
EP2407306-007	Anonymous	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
EP2407306-009	Anonymous	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
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 5834859)									
EP2407306-007	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
EP2407306-009	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

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: 5834859)									
EP2407306-007	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
EP2407306-009	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: 5834859)									
EP2407306-007	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
EP2407306-009	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

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: 5834859) - continued									
EP2407306-009	Anonymous	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: 5834859)									
EP2407306-007	Anonymous	EP231X: Sum of PFAS	----	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	<0.01	<0.01	0.0	No Limit
EP2407306-009	Anonymous	EP231X: Sum of PFAS	----	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	<0.01	<0.01	0.0	No Limit

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
ED037P: Alkalinity by PC Titrator (QCLot: 5828136)								
ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	----	----	----	----
ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	----	----	----	----
ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	<1	----	----	----	----
ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	<1	20 mg/L	92.9	85.1	126
				<1	200 mg/L	97.6	90.5	111
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 5827150)								
ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<1	25 mg/L	109	89.9	112
				<1	500 mg/L	98.9	89.9	112
ED045G: Chloride by Discrete Analyser (QCLot: 5827151)								
ED045G: Chloride	16887-00-6	1	mg/L	<1	10 mg/L	103	88.6	113
				<1	1000 mg/L	96.0	88.6	113
ED093F: Dissolved Major Cations (QCLot: 5826269)								
ED093F: Calcium	7440-70-2	1	mg/L	<1	50 mg/L	96.2	86.5	117
ED093F: Magnesium	7439-95-4	1	mg/L	<1	50 mg/L	97.9	88.4	110
ED093F: Sodium	7440-23-5	1	mg/L	<1	50 mg/L	96.2	91.4	113
ED093F: Potassium	7440-09-7	1	mg/L	<1	50 mg/L	93.2	84.6	108
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5834859)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.2218 µg/L	100	72.0	130
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.2352 µg/L	81.0	71.0	127
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	0.2373 µg/L	84.3	68.0	131
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.238 µg/L	94.3	69.0	134
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.232 µg/L	92.0	65.0	140
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.241 µg/L	95.6	53.0	142
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5834859)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	1.25 µg/L	89.7	73.0	129
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	0.25 µg/L	94.4	72.0	129
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	0.25 µg/L	106	72.0	129
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	0.25 µg/L	98.0	72.0	130
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	0.25 µg/L	91.8	71.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	0.25 µg/L	95.4	69.0	130

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
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5834859) - continued								
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	0.25 µg/L	97.2	71.0	129
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	0.25 µg/L	90.8	69.0	133
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	0.25 µg/L	98.4	72.0	134
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	0.25 µg/L	108	65.0	144
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	0.25 µg/L	94.2	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5834859)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.25 µg/L	88.2	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	0.625 µg/L	92.0	68.0	141
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	0.625 µg/L	97.0	60.5	138
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	0.625 µg/L	85.2	68.3	134
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	0.625 µg/L	100	62.2	138
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	0.25 µg/L	90.6	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
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5834859)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.2343 µg/L	94.5	63.0	143
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	0.2378 µg/L	105	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	0.24 µg/L	96.2	67.0	138
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	0.241 µg/L	99.4	64.2	133
EP231P: PFAS Sums (QCLot: 5834859)								
EP231X: Sum of PFAS	----	0.01	µg/L	<0.01	----	----	----	----
EP231X: Sum of PFHxS and PFOS	355-46-4/17 63-23-1	0.01	µg/L	<0.01	----	----	----	----
EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	<0.01	----	----	----	----

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
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 5827150)							
EP2407272-001	0089_SW382_240527						

Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 5827150) - continued							
EP2407272-001	0089_SW382_240527	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	100 mg/L	# Not Determined	70.4	130
ED045G: Chloride by Discrete Analyser (QCLot: 5827151)							
EP2407272-001	0089_SW382_240527	ED045G: Chloride	16887-00-6	200 mg/L	# Not Determined	70.0	130
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5834859)							
EP2407306-008	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.2218 µg/L	99.2	72.0	129
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.232 µg/L	83.0	71.0	127
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.2352 µg/L	88.8	68.0	129
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.238 µg/L	101	69.0	134
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.232 µg/L	88.8	65.0	140
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.241 µg/L	90.7	53.0	129
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5834859)							
EP2407306-008	Anonymous	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	1.25 µg/L	84.3	73.0	142
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.25 µg/L	92.0	72.0	129
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.25 µg/L	111	72.0	129
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.25 µg/L	99.4	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	94.6	69.0	130
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.25 µg/L	98.2	71.0	134
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.25 µg/L	98.0	69.0	133
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.25 µg/L	102	72.0	134
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.25 µg/L	109	65.0	144
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.25 µg/L	107	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5834859)							
EP2407306-008	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.25 µg/L	94.6	59.0	135
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.625 µg/L	91.4	70.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.625 µg/L	103	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.625 µg/L	88.2	70.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.625 µg/L	93.0	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.25 µg/L	93.4	65.0	136
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.25 µg/L	107	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5834859)							

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: 5834859) - continued							
EP2407306-008	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.234 µg/L	98.5	63.0	143
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.2378 µg/L	104	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.24 µg/L	101	67.0	138
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.2415 µg/L	97.1	70.0	130

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **EP2407272**	Page	: 1 of 5
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Telephone	: +61-8-9406 1301
Project	: WA_0089_PFASOMP_24	Date Samples Received	: 28-May-2024
Site	: Stirling SW/PW - MB	Issue Date	: 10-Jun-2024
Sampler	: [redacted]	No. of samples received	: 4
Order number	: pfas-omp/Stirling	No. of samples analysed	: 4

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.**
- **Matrix Spike outliers exist - please see following pages for full details.**
- **For all regular sample matrices, where applicable to the methodology, 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.**

Outliers : Quality Control Samples

Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

Matrix: **WATER**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
Matrix Spike (MS) Recoveries							
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA	EP2407272--001	0089_SW382_240527	**Sulfate as SO4 - Turbidimetric**	14808-79-8	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
ED045G: Chloride by Discrete Analyser	EP2407272--001	0089_SW382_240527	**Chloride**	16887-00-6	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**

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
ED037P: Alkalinity by PC Titrator								
Clear Plastic Bottle - Natural (ED037-P)								
0089_SW382_240527,	0089_SW353_240527,	**27-May-2024**	**----**	----	**----**	**31-May-2024**	10-Jun-2024	✓
0089_SW384_240527,	0089_SW383_240527							
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA								
Clear Plastic Bottle - Natural (ED041G)								
0089_SW382_240527,	0089_SW353_240527,	**27-May-2024**	**----**	----	**----**	**08-Jun-2024**	24-Jun-2024	✓
0089_SW384_240527,	0089_SW383_240527							
ED045G: Chloride by Discrete Analyser								
Clear Plastic Bottle - Natural (ED045G)								
0089_SW382_240527,	0089_SW353_240527,	**27-May-2024**	**----**	----	**----**	**08-Jun-2024**	24-Jun-2024	✓
0089_SW384_240527,	0089_SW383_240527							
ED093F: Dissolved Major Cations								
Clear Plastic Bottle - Natural (ED093F)								
0089_SW382_240527,	0089_SW353_240527,	**27-May-2024**	**----**	----	**----**	**31-May-2024**	03-Jun-2024	✓
0089_SW384_240527,	0089_SW383_240527							
EP231A: Perfluoroalkyl Sulfonic Acids								
HDPE (no PTFE) (EP231X)								
0089_SW382_240527,	0089_SW353_240527,	**27-May-2024**	**04-Jun-2024**	23-Nov-2024	✓	**07-Jun-2024**	23-Nov-2024	✓
0089_SW384_240527,	0089_SW383_240527							

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)							
0089_SW382_240527, 0089_SW353_240527, 0089_SW384_240527, 0089_SW383_240527	**27-May-2024**	**04-Jun-2024**	23-Nov-2024	✓	**07-Jun-2024**	23-Nov-2024	✓
EP231C: Perfluoroalkyl Sulfonamides							
HDPE (no PTFE) (EP231X)							
0089_SW382_240527, 0089_SW353_240527, 0089_SW384_240527, 0089_SW383_240527	**27-May-2024**	**04-Jun-2024**	23-Nov-2024	✓	**07-Jun-2024**	23-Nov-2024	✓
EP231D: (n:2) Fluorotelomer Sulfonic Acids							
HDPE (no PTFE) (EP231X)							
0089_SW382_240527, 0089_SW353_240527, 0089_SW384_240527, 0089_SW383_240527	**27-May-2024**	**04-Jun-2024**	23-Nov-2024	✓	**07-Jun-2024**	23-Nov-2024	✓
EP231P: PFAS Sums							
HDPE (no PTFE) (EP231X)							
0089_SW382_240527, 0089_SW353_240527, 0089_SW384_240527, 0089_SW383_240527	**27-May-2024**	**04-Jun-2024**	23-Nov-2024	✓	**07-Jun-2024**	23-Nov-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)							
Alkalinity by Auto Titrator	ED037-P	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	18	**11.11**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Alkalinity by Auto Titrator	ED037-P	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	18	**5.56**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Alkalinity by Auto Titrator	ED037-P	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	18	**5.56**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Chloride by Discrete Analyser	ED045G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	18	**5.56**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	20	**5.00**	**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
Alkalinity by Auto Titrator	ED037-P	WATER	In house: Referenced to APHA 2320 B This procedure determines alkalinity by automated measurement (e.g. PC Titrate) on a settled supernatant aliquot of the sample using pH 4.5 for indicating the total alkalinity end-point. This method is compliant with NEPM Schedule B(3)
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	WATER	In house: Referenced to APHA 4500-SO4. Dissolved sulfate is determined in a 0.45um filtered sample. Sulfate ions are converted to a barium sulfate suspension in an acetic acid medium with barium chloride. Light absorbance of the BaSO4 suspension is measured by a photometer and the SO4-2 concentration is determined by comparison of the reading with a standard curve. This method is compliant with NEPM Schedule B(3)
Chloride by Discrete Analyser	ED045G	WATER	In house: Referenced to APHA 4500 Cl - G.The thiocyanate ion is liberated from mercuric thiocyanate through sequestration of mercury by the chloride ion to form non-ionised mercuric chloride. In the presence of ferric ions the liberated thiocynate forms highly-coloured ferric thiocynate which is measured at 480 nm.
Major Cations - Dissolved	ED093F	WATER	In house: Referenced to APHA 3120 and 3125; USEPA SW 846 - 6010 and 6020; Cations are determined by either ICP-AES or ICP-MS techniques. This method is compliant with NEPM Schedule B(3) Sodium Adsorption Ratio is calculated from Ca, Mg and Na which determined by ALS in house method QWI-EN/ED093F. This method is compliant with NEPM Schedule B(3) Hardness parameters are calculated based on APHA 2340 B. This method is compliant with NEPM Schedule B(3)
Ionic Balance by PCT DA and Turbi SO4 DA	* EN055 - PG	WATER	In house: Referenced to APHA 1030F. This method is compliant with NEPM Schedule B(3)
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.

ALSCompass SAMPLING Intelligence

ALS

Environmental Division Perth

Work Order Reference EP2407273

Telephone : +61-8-9406 1301

Custody Document for Submissions via ALS Compass App

Project: WA-0089-PFASOMP-24 Client: STANTEC Project Manager: [redacted]

Phone: ( )

ALS Compass COC Reference: 68219 68227 68226 68220 68225 # Samples: Sampler: [redacted]

Phone: ( )

Turnaround Requirements: Standard / Urgent

Special Instructions:

Custody:

Relinquished by:	Received by:	Relinquished by:	Received by:
STANTEC	[redacted]		
Date / Time: 28/5/24	Date / Time: 29/5 1320	Date / Time:	Date / Time:

:HAIN OF CUSTODY

OC#: 68225 *ALS Laboratory:* EP Perth Environmental

MWHAUS - STANTEC AUSTRALIA PTY LTD

WA_0089_PFASOMP_24

Stirling GW - CG

): pfas-omp/Stirling

MANAGER: [redacted]

SAMPLER: [redacted]

CONTACT PH: [redacted]

SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

'ORTS TO: [redacted] derp.labreports@esdat.com.au

)ICES TO: [redacted]

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

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		
NAME	DESCRIPTION	DATE / TIME	MATRIX	TOTAL BOTTLES	ON HOLD	WA OMP Water Suite WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
0089_MW195D		27/05/2024 11:12 AM	WATER	ALS: 3 Non ALS: 0	No	X		
0089_QC102		27/05/2024 11:15 AM	WATER	ALS: 3 Non ALS: 0	No	X		
0089_MW195S		27/05/2024 12:12 PM	WATER	ALS: 3 Non ALS: 0	No	X		
0089_QC103		27/05/2024 12:14 PM	WATER	ALS: 3 Non ALS: 0	No	X		
0089_MW193		27/05/2024 12:30 PM	WATER	ALS: 3 Non ALS: 0	No	X		
0089_QC105		27/05/2024 12:30 PM	WATER	ALS: 3 Non ALS: 0	No	X		
0089_MW173		27/05/2024 12:35 PM	WATER	ALS: 3 Non ALS: 0	No	X		

CHAIN OF CUSTODY

COC#: 68225 *ALS Laboratory:* EP Perth Environmental

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

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP_24

SITE: Stirling GW - CG

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]derp.labreports@esdat.com.au

EMAIL INVOICES 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	0089_MW195D	Clear Plastic Bottle - Natural	125 mL	00071121178052	Green	No	
001	0089_MW195D	HDPE (no PTFE)	20 mL	00352312048510	Grey	No	
001	0089_MW195D	HDPE (no PTFE)	20 mL	00351221024858	Grey	No	
002	0089_QC102	Clear Plastic Bottle - Natural	125 mL	00070821217636	Green	No	
002	0089_QC102	HDPE (no PTFE)	20 mL	00351221024771	Grey	No	
002	0089_QC102	HDPE (no PTFE)	20 mL	00351221024757	Grey	No	
003	0089_MW195S	HDPE (no PTFE)	20 mL	00352312048588	Grey	No	
003	0089_MW195S	HDPE (no PTFE)	20 mL	00351221024799	Grey	No	
003	0089_MW195S	Clear Plastic Bottle - Natural	125 mL	00070821217715	Green	No	
004	0089_QC103	Clear Plastic Bottle - Natural	125 mL	00071121177960	Green	No	
004	0089_QC103	HDPE (no PTFE)	20 mL	00351221024797	Grey	No	
004	0089_QC103	HDPE (no PTFE)	20 mL	00351221024782	Grey	No	
005	0089_MW193	HDPE (no PTFE)	20 mL	00351221024808	Grey	No	
005	0089_MW193	HDPE (no PTFE)	20 mL	00351221024836	Grey	No	
005	0089_MW193	Clear Plastic Bottle - Natural	125 mL	00071121178095	Green	No	
006	0089_QC105	HDPE (no PTFE)	20 mL	00351221024603	Grey	No	
006	0089_QC105	HDPE (no PTFE)	20 mL	00351221024718	Grey	No	
006	0089_QC105	Clear Plastic Bottle - Natural	125 mL	00071121178012	Green	No	
007	0089_MW173	HDPE (no PTFE)	20 mL	00351221024804	Grey	No	
007	0089_MW173	HDPE (no PTFE)	20 mL	00351221024727	Grey	No	
007	0089_MW173	Clear Plastic Bottle - Natural	125 mL	00070821217661	Green	No	

Total Bottle Count: ALS: 21, Non ALS: 0

SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : **EP2407273**

Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: [redacted]
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
E-mail	: [redacted]stantec.com	E-mail	: [redacted]alsglobal.com
Telephone	: ----	Telephone	: +61-8-9406 1301
Facsimile	: ----	Facsimile	: +61-8-9406 1399
Project	: WA_0089_PFASOMP_24	Page	: 1 of 2
Order number	: pfas-omp/Stirling	Quote number	: ES2022MWHAUS0002 (SY/139/19 B)
C-O-C number	: 68225	QC Level	: NEPM 2013 B3 & ALS QC Standard
Site	: Stirling GW - CG		
Sampler	: [redacted]		

Dates

Date Samples Received	: 28-May-2024 13:20	Issue Date	: 30-May-2024
Client Requested Due Date	: 10-Jun-2024	Scheduled Reporting Date	: **10-Jun-2024**

Delivery Details

Mode of Delivery	: Carrier	Security Seal	: Intact.
No. of coolers/boxes	: 1	Temperature	: 7.7 - Ice present
Receipt Detail	:	No. of samples received / analysed	: 7 / 7

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 see scanned COC for sample discrepencies: extra samples , samples not received etc.
- Please direct any queries related to sample condition / numbering / breakages to Sample Receipt (Samples.Perth@alsglobal.com)
- Analytical work for this work order will be conducted at ALS Environmental Perth.
- Please direct any turnaround / technical queries to the laboratory contact designated above.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months) from receipt of samples.
- **pH analysis should be conducted within 6 hours of sampling.**
- **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.**
- 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 (30 analytes)	WATER - NT-01 & 02 Ca, Mg, Na, K, Cl, SO4, Alkalinity
EP2407273-001	27-May-2024 11:12	0089_MW195D_240527	✓	✓
EP2407273-002	27-May-2024 11:15	0089_QC102_240527	✓	✓
EP2407273-003	27-May-2024 12:12	0089_MW195S_240527	✓	✓
EP2407273-004	27-May-2024 12:14	0089_QC103_240527	✓	✓
EP2407273-005	27-May-2024 12:30	0089_MW193_240527	✓	✓
EP2407273-006	27-May-2024 12:30	0089_QC105_240527	✓	✓
EP2407273-007	27-May-2024 12:35	0089_MW173_240527	✓	✓

Proactive Holding Time Report

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

Requested Deliverables

[redacted]
- A4 - AU Tax Invoice (INV) — Email — [redacted]cardno.com.au

DERP LAB REPORTS
- EDI Format - ESDAT (ESDAT) — Email — derp.labreports@esdat.com.au

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

CERTIFICATE OF ANALYSIS

Work Order	: **EP2407273**	Page	: 1 of 9
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: [redacted]
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: +61-8-9406 1301
Project	: WA_0089_PFASOMP_24	Date Samples Received	: 28-May-2024 13:20
Order number	: pfas-omp/Stirling	Date Analysis Commenced	: 30-May-2024
C-O-C number	: 68225	Issue Date	: 10-Jun-2024 15:56
Sampler	: [redacted] [redacted]		
Site	: Stirling GW - CG		
Quote number	: SY/139/19 B		
No. of samples received	: 7		
No. of samples analysed	: 7		

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]	Laboratory Manager (Perth)	Perth Inorganics, Wangara, WA
[redacted]	Senior Organic Chemist	Perth Organics, Wangara, WA

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.
- As per QWI – EN55-3 Data Interpreting Procedures, Ionic balances are typically calculated using Major Anions - Chloride, Alkalinity and Sulfate; and Major Cations - Calcium, Magnesium, Potassium and Sodium. Where applicable and dependent upon sample matrix, the Ionic Balance may also include the additional contribution of Ammonia, Dissolved Metals by ICPMS and H+ to the Cations and Nitrate, SiO2 and Fluoride to the Anions.
- Sodium Adsorption Ratio (where reported): Where results for Na, Ca or Mg are <LOR, a concentration at half the reported LOR is incorporated into the SAR calculation. This represents a conservative approach for Na relative to the assumption that <LOR = zero concentration and a conservative approach for Ca & Mg relative to the assumption that <LOR is equivalent to the LOR concentration.
- 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.
- ED045G: The presence of Thiocyanate, Thiosulfate and Sulfite can positively contribute to the chloride result, thereby may bias results higher than expected. Results should be scrutinised accordingly.

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW195D_240527	0089_QC102_240527	0089_MW195S_240527	0089_QC103_240527	0089_MW193_240527
				Sampling date / time	27-May-2024 11:12	27-May-2024 11:15	27-May-2024 12:12	27-May-2024 12:14	27-May-2024 12:30
Compound	CAS Number	LOR	Unit		EP2407273-001	EP2407273-002	EP2407273-003	EP2407273-004	EP2407273-005
					Result	Result	Result	Result	Result
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	<1	<1	<1	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	<1	<1	<1	<1
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		218	190	566	583	743
Total Alkalinity as CaCO3	----	1	mg/L		218	190	566	583	743
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		1290	1500	277	286	207
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		9490	10600	841	908	783
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		326	350	174	177	110
Magnesium	7439-95-4	1	mg/L		685	758	123	127	140
Sodium	7440-23-5	1	mg/L		4970	5600	447	480	482
Potassium	7440-09-7	1	mg/L		258	289	41	42	34
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		299	334	40.8	43.2	41.2
ø Total Cations	----	0.01	meq/L		295	331	39.3	41.2	38.8
ø Ionic Balance	----	0.01	%		0.59	0.48	1.87	2.34	2.99
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	0.73
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	0.90
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		0.01	0.02	<0.01	<0.01	10.4
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	0.81
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	3.78
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW195D_240527	0089_QC102_240527	0089_MW195S_240527	0089_QC103_240527	0089_MW193_240527
				Sampling date / time	27-May-2024 11:12	27-May-2024 11:15	27-May-2024 12:12	27-May-2024 12:14	27-May-2024 12:30
Compound	CAS Number	LOR	Unit		EP2407273-001	EP2407273-002	EP2407273-003	EP2407273-004	EP2407273-005
					Result	Result	Result	Result	Result
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		<0.1	<0.1	<0.1	<0.1	**0.2**
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		**0.04**	<0.02	<0.02	<0.02	**0.38**
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		**0.04**	<0.02	<0.02	<0.02	**1.70**
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		**0.06**	<0.02	<0.02	<0.02	**0.27**
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	**0.64**
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	**0.04**
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
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									

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW195D_240527	0089_QC102_240527	0089_MW195S_240527	0089_QC103_240527	0089_MW193_240527
				Sampling date / time	27-May-2024 11:12	27-May-2024 11:15	27-May-2024 12:12	27-May-2024 12:14	27-May-2024 12:30
Compound	CAS Number	LOR	Unit		EP2407273-001	EP2407273-002	EP2407273-003	EP2407273-004	EP2407273-005
					Result	Result	Result	Result	Result
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
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		**0.15**	**0.02**	<0.01	<0.01	**19.8**
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		**0.01**	**0.02**	<0.01	<0.01	**14.2**
Sum of PFAS (WA DER List)	----	0.01	µg/L		**0.15**	**0.02**	<0.01	<0.01	**18.1**
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**94.1**	**100**	**91.6**	**97.0**	**98.3**
13C8-PFOA	----	0.02	%		**102**	**104**	**102**	**99.5**	**93.7**

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_QC105_240527	0089_MW173_240527	----	----	----
				Sampling date / time	27-May-2024 12:30	27-May-2024 12:35	----	----	----
Compound	CAS Number	LOR	Unit		EP2407273-006	EP2407273-007	--------	--------	--------
					Result	Result	----	----	----
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	<1	----	----	----
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	<1	----	----	----
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		**770**	**359**	----	----	----
Total Alkalinity as CaCO3	----	1	mg/L		**770**	**359**	----	----	----
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		**210**	**63**	----	----	----
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		**785**	**335**	----	----	----
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		**112**	**109**	----	----	----
Magnesium	7439-95-4	1	mg/L		**149**	**60**	----	----	----
Sodium	7440-23-5	1	mg/L		**538**	**181**	----	----	----
Potassium	7440-09-7	1	mg/L		**38**	**13**	----	----	----
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		**41.9**	**17.9**	----	----	----
ø Total Cations	----	0.01	meq/L		**42.2**	**18.6**	----	----	----
ø Ionic Balance	----	0.01	%		**0.39**	**1.78**	----	----	----
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		**0.75**	**0.07**	----	----	----
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		**0.94**	**0.04**	----	----	----
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		**10.9**	**0.78**	----	----	----
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		**0.81**	**0.18**	----	----	----
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		**3.63**	**2.39**	----	----	----
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	<0.02	----	----	----

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_QC105_240527	0089_MW173_240527	----	----	----
				Sampling date / time	27-May-2024 12:30	27-May-2024 12:35	----	----	----
Compound	CAS Number	LOR	Unit		EP2407273-006	EP2407273-007	--------	--------	--------
					Result	Result	----	----	----
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		**0.2**	<0.1	----	----	----
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		**0.40**	**0.07**	----	----	----
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		**1.80**	**0.18**	----	----	----
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		**0.29**	**0.02**	----	----	----
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		**0.71**	**0.11**	----	----	----
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		**0.04**	<0.02	----	----	----
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		<0.05	<0.05	----	----	----
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L		<0.02	<0.02	----	----	----
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L		<0.05	<0.05	----	----	----
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L		<0.05	<0.05	----	----	----
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L		<0.05	<0.05	----	----	----
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L		<0.05	<0.05	----	----	----
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L		<0.02	<0.02	----	----	----
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L		<0.02	<0.02	----	----	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids									

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_QC105_240527	0089_MW173_240527	----	----	----
				Sampling date / time	27-May-2024 12:30	27-May-2024 12:35	----	----	----
Compound	CAS Number	LOR	Unit		EP2407273-006	EP2407273-007	--------	--------	--------
					Result	Result	----	----	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L		<0.05	<0.05	----	----	----
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		<0.05	<0.05	----	----	----
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		<0.05	<0.05	----	----	----
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L		<0.05	<0.05	----	----	----
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L		**20.5**	**3.84**	----	----	----
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		**14.5**	**3.17**	----	----	----
Sum of PFAS (WA DER List)	----	0.01	µg/L		**18.7**	**3.62**	----	----	----
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**95.3**	**93.6**	----	----	----
13C8-PFOA	----	0.02	%		**97.3**	**97.2**	----	----	----

Surrogate Control Limits

Sub-Matrix: **GROUNDWATER**		Recovery Limits (%)	
Compound	*CAS Number*	*Low*	*High*
EP231S: PFAS Surrogate			
13C4-PFOS	----	65	140
13C8-PFOA	----	71	133

QUALITY CONTROL REPORT

Work Order	: **EP2407273**	Page	: 1 of 12
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: [redacted]
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: +61-8-9406 1301
Project	: WA_0089_PFASOMP_24	Date Samples Received	: 28-May-2024
Order number	: pfas-omp/Stirling	Date Analysis Commenced	: 30-May-2024
C-O-C number	: 68225	Issue Date	: 10-Jun-2024
Sampler	: [redacted] [redacted]		
Site	: Stirling GW - CG		
Quote number	: SY/139/19 B		
No. of samples received	: 7		
No. of samples analysed	: 7		

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]	Laboratory Manager (Perth)	Perth Inorganics, Wangara, WA
[redacted]	Senior Organic Chemist	Perth Organics, Wangara, WA

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 (%)
ED037P: Alkalinity by PC Titrator (QC Lot: 5828136)									
EP2407272-002	Anonymous	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	120	120	0.0	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	120	120	0.0	0% - 20%
EP2407273-007	0089_MW173_240527	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	359	358	0.0	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	359	358	0.0	0% - 20%
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QC Lot: 5827144)									
EP2407030-023	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	1110	1090	1.5	0% - 20%
EP2407273-004	0089_QC103_240527	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	286	286	0.0	0% - 20%
ED045G: Chloride by Discrete Analyser (QC Lot: 5827143)									
EP2407030-023	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	7320	7340	0.1	0% - 20%
EP2407273-004	0089_QC103_240527	ED045G: Chloride	16887-00-6	1	mg/L	908	900	0.9	0% - 20%
ED093F: Dissolved Major Cations (QC Lot: 5826269)									
EP2407272-001	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	425	410	3.7	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	1410	1360	3.7	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	11000	10600	4.0	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	643	620	3.7	0% - 20%
EP2407273-007	0089_MW173_240527	ED093F: Calcium	7440-70-2	1	mg/L	109	110	0.0	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	60	60	0.0	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	181	181	0.0	0% - 20%

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 (%)
ED093F: Dissolved Major Cations (QC Lot: 5826269) - continued									
EP2407273-007	0089_MW173_240527	ED093F: Potassium	7440-09-7	1	mg/L	13	13	0.0	0% - 50%
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 5834859)									
EP2407306-007	Anonymous	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
EP2407306-009	Anonymous	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: 5838188)									
EP2407306-002	Anonymous	EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	1.59	1.64	3.0	0% - 20%
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	5.61	6.72	18.0	0% - 20%
		EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	0.08	0.08	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	0.03	0.03	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	0.49	0.56	12.9	0% - 20%
		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: 5834859)									
EP2407306-007	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
EP2407306-009	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

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: 5834859) - continued									
EP2407306-009	Anonymous	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: 5838188)									
EP2407306-002	Anonymous	EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	0.18	0.18	5.7	0% - 50%
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	0.31	0.32	0.0	0% - 50%
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	0.30	0.30	0.0	0% - 50%
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	0.14	0.13	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	0.03	0.04	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: 5834859)									
EP2407306-007	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
EP2407306-009	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

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: 5834859) - continued									
EP2407306-009	Anonymous	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: 5838188)									
EP2407306-002	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: 5834859)									
EP2407306-007	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
EP2407306-009	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
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 5838188)									

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: 5838188) - continued									
EP2407306-002	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	0.06	0.06	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: 5834859)									
EP2407306-007	Anonymous	EP231X: Sum of PFAS	----	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	<0.01	<0.01	0.0	No Limit
EP2407306-009	Anonymous	EP231X: Sum of PFAS	----	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	<0.01	<0.01	0.0	No Limit
EP231P: PFAS Sums (QC Lot: 5838188)									
EP2407306-002	Anonymous	EP231X: Sum of PFAS	----	0.01	µg/L	8.92	10.2	13.0	0% - 20%
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	7.20	8.36	14.9	0% - 20%
		EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	8.37	9.53	13.0	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
ED037P: Alkalinity by PC Titrator (QCLot: 5828136)								
ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	----	----	----	----
ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	----	----	----	----
ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	<1	----	----	----	----
ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	<1	20 mg/L	92.9	85.1	126
				<1	200 mg/L	97.6	90.5	111
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 5827144)								
ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<1	25 mg/L	103	89.9	112
				<1	500 mg/L	97.7	89.9	112
ED045G: Chloride by Discrete Analyser (QCLot: 5827143)								
ED045G: Chloride	16887-00-6	1	mg/L	<1	10 mg/L	96.1	88.6	113
				<1	1000 mg/L	95.6	88.6	113
ED093F: Dissolved Major Cations (QCLot: 5826269)								
ED093F: Calcium	7440-70-2	1	mg/L	<1	50 mg/L	96.2	86.5	117
ED093F: Magnesium	7439-95-4	1	mg/L	<1	50 mg/L	97.9	88.4	110
ED093F: Sodium	7440-23-5	1	mg/L	<1	50 mg/L	96.2	91.4	113
ED093F: Potassium	7440-09-7	1	mg/L	<1	50 mg/L	93.2	84.6	108
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5834859)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.2218 µg/L	100	72.0	130
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.2352 µg/L	81.0	71.0	127
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	0.2373 µg/L	84.3	68.0	131
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.238 µg/L	94.3	69.0	134
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.232 µg/L	92.0	65.0	140
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.241 µg/L	95.6	53.0	142
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5838188)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.2218 µg/L	97.4	72.0	130
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.2352 µg/L	83.5	71.0	127
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	0.2373 µg/L	93.6	68.0	131
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.238 µg/L	105	69.0	134
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.232 µg/L	97.6	65.0	140
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.241 µg/L	101	53.0	142

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: 5834859)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	1.25 µg/L	89.7	73.0	129
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	0.25 µg/L	94.4	72.0	129
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	0.25 µg/L	106	72.0	129
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	0.25 µg/L	98.0	72.0	130
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	0.25 µg/L	91.8	71.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	0.25 µg/L	95.4	69.0	130
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	0.25 µg/L	97.2	71.0	129
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	0.25 µg/L	90.8	69.0	133
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	0.25 µg/L	98.4	72.0	134
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	0.25 µg/L	108	65.0	144
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	0.25 µg/L	94.2	71.0	132
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5838188)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	1.25 µg/L	97.2	73.0	129
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	0.25 µg/L	104	72.0	129
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	0.25 µg/L	111	72.0	129
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	0.25 µg/L	101	72.0	130
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	0.25 µg/L	96.6	71.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	0.25 µg/L	96.4	69.0	130
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	0.25 µg/L	97.0	71.0	129
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	0.25 µg/L	105	69.0	133
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	0.25 µg/L	102	72.0	134
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	0.25 µg/L	95.2	65.0	144
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	0.25 µg/L	100	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5834859)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.25 µg/L	88.2	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	0.625 µg/L	92.0	68.0	141
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	0.625 µg/L	97.0	60.5	138
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	0.625 µg/L	85.2	68.3	134
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	0.625 µg/L	100	62.2	138
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	0.25 µg/L	90.6	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

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
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5838188)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.25 µg/L	96.6	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	0.625 µg/L	97.3	68.0	141
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	0.625 µg/L	102	60.5	138
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	0.625 µg/L	112	68.3	134
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	0.625 µg/L	93.6	62.2	138
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	0.25 µg/L	111	65.0	136
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	0.25 µg/L	99.4	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5834859)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.2343 µg/L	94.5	63.0	143
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	0.2378 µg/L	105	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	0.24 µg/L	96.2	67.0	138
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	0.241 µg/L	99.4	64.2	133
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5838188)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.2343 µg/L	111	63.0	143
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	0.2378 µg/L	105	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	0.24 µg/L	115	67.0	138
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	0.241 µg/L	98.5	64.2	133
EP231P: PFAS Sums (QCLot: 5834859)								
EP231X: Sum of PFAS	----	0.01	µg/L	<0.01	----	----	----	----
EP231X: Sum of PFHxS and PFOS	355-46-4/17 63-23-1	0.01	µg/L	<0.01	----	----	----	----
EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	<0.01	----	----	----	----
EP231P: PFAS Sums (QCLot: 5838188)								
EP231X: Sum of PFAS	----	0.01	µg/L	<0.01	----	----	----	----
EP231X: Sum of PFHxS and PFOS	355-46-4/17 63-23-1	0.01	µg/L	<0.01	----	----	----	----
EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	<0.01	----	----	----	----

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**

Matrix Spike (MS) Report

Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 5827144)							
EP2407030-023	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	100 mg/L	# Not Determined	70.4	130
ED045G: Chloride by Discrete Analyser (QCLot: 5827143)							
EP2407030-023	Anonymous	ED045G: Chloride	16887-00-6	200 mg/L	# Not Determined	70.0	130
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5834859)							
EP2407306-008	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.2218 µg/L	99.2	72.0	129
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.232 µg/L	83.0	71.0	127
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.2352 µg/L	88.8	68.0	129
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.238 µg/L	101	69.0	134
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.232 µg/L	88.8	65.0	140
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.241 µg/L	90.7	53.0	129
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5838188)							
EP2407316-013	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.2218 µg/L	92.2	72.0	129
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.232 µg/L	84.3	71.0	127
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.2352 µg/L	93.4	68.0	129
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.238 µg/L	95.4	69.0	134
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.232 µg/L	99.4	65.0	140
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.241 µg/L	76.6	53.0	129
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5834859)							
EP2407306-008	Anonymous	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	1.25 µg/L	84.3	73.0	142
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.25 µg/L	92.0	72.0	129
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.25 µg/L	111	72.0	129
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.25 µg/L	99.4	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	94.6	69.0	130
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.25 µg/L	98.2	71.0	134
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.25 µg/L	98.0	69.0	133
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.25 µg/L	102	72.0	134
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.25 µg/L	109	65.0	144
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.25 µg/L	107	71.0	132
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5838188)							
EP2407316-013	Anonymous	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	1.25 µg/L	111	73.0	142
		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	102	72.0	129
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.25 µg/L	91.9	72.0	130
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.25 µg/L	93.1	71.0	133
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.25 µg/L	93.0	69.0	130

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: 5838188) - continued							
EP2407316-013	Anonymous	EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.25 µg/L	93.6	71.0	134
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.25 µg/L	108	69.0	133
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.25 µg/L	96.6	72.0	134
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.25 µg/L	92.8	65.0	144
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.25 µg/L	100	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5834859)							
EP2407306-008	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.25 µg/L	94.6	59.0	135
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.625 µg/L	91.4	70.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.625 µg/L	103	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.625 µg/L	88.2	70.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.625 µg/L	93.0	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.25 µg/L	93.4	65.0	136
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.25 µg/L	107	61.0	135
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5838188)							
EP2407316-013	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.25 µg/L	97.6	59.0	135
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.625 µg/L	91.6	70.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.625 µg/L	92.6	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.625 µg/L	106	70.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.625 µg/L	102	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.25 µg/L	101	65.0	136
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.25 µg/L	92.4	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5834859)							
EP2407306-008	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.234 µg/L	98.5	63.0	143
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.2378 µg/L	104	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.24 µg/L	101	67.0	138
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.2415 µg/L	97.1	70.0	130
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5838188)							
EP2407316-013	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.234 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: 5838188) - continued							
EP2407316-013	Anonymous	EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.2378 µg/L	93.1	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.24 µg/L	109	67.0	138
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.2415 µg/L	74.5	70.0	130

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **EP2407273**	Page	: 1 of 6
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Telephone	: +61-8-9406 1301
Project	: WA_0089_PFASOMP_24	Date Samples Received	: 28-May-2024
Site	: Stirling GW - CG	Issue Date	: 10-Jun-2024
Sampler	: [redacted] [redacted]	No. of samples received	: 7
Order number	: pfas-omp/Stirling	No. of samples analysed	: 7

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.**
- **Matrix Spike outliers exist - please see following pages for full details.**
- **For all regular sample matrices, where applicable to the methodology, 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 : Quality Control Samples

Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

Matrix: **WATER**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
Matrix Spike (MS) Recoveries							
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA	EP2407030--023	Anonymous	**Sulfate as SO4 - Turbidimetric**	14808-79-8	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
ED045G: Chloride by Discrete Analyser	EP2407030--023	Anonymous	**Chloride**	16887-00-6	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**

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	34	8.82	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
ED037P: Alkalinity by PC Titrator								
Clear Plastic Bottle - Natural (ED037-P)								
0089_MW195D_240527,	0089_QC102_240527,	**27-May-2024**	**----**	----	**----**	**31-May-2024**	10-Jun-2024	✓
0089_MW195S_240527,	0089_QC103_240527,							
0089_MW193_240527,	0089_QC105_240527,							
0089_MW173_240527								
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA								
Clear Plastic Bottle - Natural (ED041G)								
0089_MW195D_240527,	0089_QC102_240527,	**27-May-2024**	**----**	----	**----**	**05-Jun-2024**	24-Jun-2024	✓
0089_MW195S_240527,	0089_QC103_240527,							
0089_MW193_240527,	0089_QC105_240527,							
0089_MW173_240527								

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
ED045G: Chloride by Discrete Analyser								
Clear Plastic Bottle - Natural (ED045G)								
0089_MW195D_240527, 0089_MW195S_240527, 0089_MW193_240527, 0089_MW173_240527	0089_QC102_240527, 0089_QC103_240527, 0089_QC105_240527,	**27-May-2024**	**----**	----	----	**05-Jun-2024**	24-Jun-2024	✓
ED093F: Dissolved Major Cations								
Clear Plastic Bottle - Natural (ED093F)								
0089_MW195D_240527, 0089_MW195S_240527, 0089_MW193_240527, 0089_MW173_240527	0089_QC102_240527, 0089_QC103_240527, 0089_QC105_240527,	**27-May-2024**	**----**	----	----	**31-May-2024**	03-Jun-2024	✓
EP231A: Perfluoroalkyl Sulfonic Acids								
HDPE (no PTFE) (EP231X)								
0089_MW195D_240527, 0089_MW195S_240527,	0089_QC102_240527, 0089_QC103_240527	**27-May-2024**	**04-Jun-2024**	23-Nov-2024	✓	**07-Jun-2024**	23-Nov-2024	✓
HDPE (no PTFE) (EP231X)								
0089_MW193_240527, 0089_MW173_240527	0089_QC105_240527,	**27-May-2024**	**06-Jun-2024**	23-Nov-2024	✓	**07-Jun-2024**	23-Nov-2024	✓
EP231B: Perfluoroalkyl Carboxylic Acids								
HDPE (no PTFE) (EP231X)								
0089_MW195D_240527, 0089_MW195S_240527,	0089_QC102_240527, 0089_QC103_240527	**27-May-2024**	**04-Jun-2024**	23-Nov-2024	✓	**07-Jun-2024**	23-Nov-2024	✓
HDPE (no PTFE) (EP231X)								
0089_MW193_240527, 0089_MW173_240527	0089_QC105_240527,	**27-May-2024**	**06-Jun-2024**	23-Nov-2024	✓	**07-Jun-2024**	23-Nov-2024	✓
EP231C: Perfluoroalkyl Sulfonamides								
HDPE (no PTFE) (EP231X)								
0089_MW195D_240527, 0089_MW195S_240527,	0089_QC102_240527, 0089_QC103_240527	**27-May-2024**	**04-Jun-2024**	23-Nov-2024	✓	**07-Jun-2024**	23-Nov-2024	✓
HDPE (no PTFE) (EP231X)								
0089_MW193_240527, 0089_MW173_240527	0089_QC105_240527,	**27-May-2024**	**06-Jun-2024**	23-Nov-2024	✓	**07-Jun-2024**	23-Nov-2024	✓
EP231D: (n:2) Fluorotelomer Sulfonic Acids								
HDPE (no PTFE) (EP231X)								
0089_MW195D_240527, 0089_MW195S_240527,	0089_QC102_240527, 0089_QC103_240527	**27-May-2024**	**04-Jun-2024**	23-Nov-2024	✓	**07-Jun-2024**	23-Nov-2024	✓
HDPE (no PTFE) (EP231X)								
0089_MW193_240527, 0089_MW173_240527	0089_QC105_240527,	**27-May-2024**	**06-Jun-2024**	23-Nov-2024	✓	**07-Jun-2024**	23-Nov-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) 0089_MW195D_240527, 0089_QC102_240527, 0089_MW195S_240527, 0089_QC103_240527	**27-May-2024**	**04-Jun-2024**	23-Nov-2024	✓	**07-Jun-2024**	23-Nov-2024	✓
HDPE (no PTFE) (EP231X) 0089_MW193_240527, 0089_QC105_240527, 0089_MW173_240527	**27-May-2024**	**06-Jun-2024**	23-Nov-2024	✓	**07-Jun-2024**	23-Nov-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)							
Alkalinity by Auto Titrator	ED037-P	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	3	34	**8.82**	**10.00**	×	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Alkalinity by Auto Titrator	ED037-P	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	34	**5.88**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Alkalinity by Auto Titrator	ED037-P	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	34	**5.88**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Chloride by Discrete Analyser	ED045G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	34	**5.88**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	20	**5.00**	**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
Alkalinity by Auto Titrator	ED037-P	WATER	In house: Referenced to APHA 2320 B This procedure determines alkalinity by automated measurement (e.g. PC Titrate) on a settled supernatant aliquot of the sample using pH 4.5 for indicating the total alkalinity end-point. This method is compliant with NEPM Schedule B(3)
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	WATER	In house: Referenced to APHA 4500-SO4. Dissolved sulfate is determined in a 0.45um filtered sample. Sulfate ions are converted to a barium sulfate suspension in an acetic acid medium with barium chloride. Light absorbance of the BaSO4 suspension is measured by a photometer and the SO4-2 concentration is determined by comparison of the reading with a standard curve. This method is compliant with NEPM Schedule B(3)
Chloride by Discrete Analyser	ED045G	WATER	In house: Referenced to APHA 4500 Cl - G.The thiocyanate ion is liberated from mercuric thiocyanate through sequestration of mercury by the chloride ion to form non-ionised mercuric chloride. In the presence of ferric ions the liberated thiocynate forms highly-coloured ferric thiocynate which is measured at 480 nm.
Major Cations - Dissolved	ED093F	WATER	In house: Referenced to APHA 3120 and 3125; USEPA SW 846 - 6010 and 6020; Cations are determined by either ICP-AES or ICP-MS techniques. This method is compliant with NEPM Schedule B(3) Sodium Adsorption Ratio is calculated from Ca, Mg and Na which determined by ALS in house method QWI-EN/ED093F. This method is compliant with NEPM Schedule B(3) Hardness parameters are calculated based on APHA 2340 B. This method is compliant with NEPM Schedule B(3)
Ionic Balance by PCT DA and Turbi SO4 DA	* EN055 - PG	WATER	In house: Referenced to APHA 1030F. This method is compliant with NEPM Schedule B(3)
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.

ALSCompass
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ALS

Environmental Division
Perth
Work Order Reference
EP2407274

Telephone : +61-8-9406 1301

Custody Document for Submissions via ALS Compass App

Project: WA-0089-PPASOMP-24 Client: STANTEC Project Manager: [redacted]

ALS Compass COC Reference: 68225 68219 68227 68226 68220 # Samples: Phone: ( )

Sampler: [redacted]

Phone: ( )

Turnaround Requirements: Standard Urgent

Special Instructions:

Custody:

Relinquished by: STANTEC	Received by: [redacted]	Relinquished by:	Received by:
Date / Time: 28/5/24	Date / Time: 29/5 1320	Date / Time:	Date / Time:

CHAIN OF CUSTODY

COC#: 68226 *ALS Laboratory:* EP Perth Environmental

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

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP_24

SITE: Stirling SD - CG

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted]

QUOTE NO: SY/139/19 B

SAMPLER MOBILE: [redacted] / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted] derp.labreports@esdat.com.au

EMAIL INVOICES 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 Sediments SEDIMENT	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
001	0089_SD350		27/05/2024 02:43 PM	SOIL	ALS: 1 Non ALS: 0	No	X		
002	0089_SD381		27/05/2024 02:43 PM	SOIL	ALS: 1 Non ALS: 0	No	X		
003	0089_SD401		27/05/2024 02:44 PM	SOIL	ALS: 1 Non ALS: 0	No	X		
004	0089_SD352		27/05/2024 02:44 PM	SOIL	ALS: 1 Non ALS: 0	No	X		
005	0089_SD351		27/05/2024 02:44 PM	SOIL	ALS: 1 Non ALS: 0	No	X		
006	0089_SD380		27/05/2024 02:45 PM	SOIL	ALS: 1 Non ALS: 0	No	X		

CHAIN OF CUSTODY

ALS COC#: 68226 ALS Laboratory: EP Perth Environmental

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP_24

SITE: Stirling SD - CG

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted] derp.labreports@esdat.com.au

EMAIL INVOICES TO: [redacted]

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

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	0089_SD350	HDPE Soil Jar	200 mL	00621122049132	Grey	No	
002	0089_SD381	HDPE Soil Jar	200 mL	00621122049169	Grey	No	
003	0089_SD401	HDPE Soil Jar	200 mL	00621122049103	Grey	No	
004	0089_SD352	HDPE Soil Jar	200 mL	00621122049145	Grey	No	
005	0089_SD351	HDPE Soil Jar	200 mL	00621122049184	Grey	No	
006	0089_SD380	HDPE Soil Jar	200 mL	00621122049112	Grey	No	

Total Bottle Count: ALS: 6, Non ALS: 0

SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : **EP2407274**

Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: [redacted]
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
E-mail	: [redacted]stantec.com	E-mail	: [redacted]alsglobal.com
Telephone	: ----	Telephone	: +61-8-9406 1301
Facsimile	: ----	Facsimile	: +61-8-9406 1399
Project	: WA_0089_PFASOMP_24	Page	: 1 of 2
Order number	: pfas-omp/Stirling	Quote number	: ES2022MWHAUS0002 (SY/139/19 B)
C-O-C number	: 68226	QC Level	: NEPM 2013 B3 & ALS QC Standard
Site	: Stirling SD - CG		
Sampler	: [redacted]		

Dates

Date Samples Received	: 28-May-2024 13:20	Issue Date	: 30-May-2024
Client Requested Due Date	: 10-Jun-2024	Scheduled Reporting Date	: **10-Jun-2024**

Delivery Details

Mode of Delivery	: Carrier	Security Seal	: Intact.
No. of coolers/boxes	: 1	Temperature	: 7.7 - Ice present
Receipt Detail	:	No. of samples received / analysed	: 6 / 6

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 see scanned COC for sample discrepencies: extra samples , samples not received etc.
- Please direct any queries related to sample condition / numbering / breakages to Sample Receipt (Samples.Perth@alsglobal.com)
- Analytical work for this work order will be conducted at ALS Environmental Perth.
- Please direct any turnaround / technical queries to the laboratory contact designated above.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months) from receipt of samples.
- **pH analysis should be conducted within 6 hours of sampling.**
- **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.**
- 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: **SOIL**

Laboratory sample ID	Sampling date / time	Sample ID	SOIL - EA055-103 Moisture Content	SOIL - EP231X (solids) PFAS - Full Suite (30 analytes)
EP2407274-001	27-May-2024 14:43	0089_SD350_240527	✓	✓
EP2407274-002	27-May-2024 14:43	0089_SD381_240527	✓	✓
EP2407274-003	27-May-2024 14:44	0089_SD401_240527	✓	✓
EP2407274-004	27-May-2024 14:44	0089_SD352_240527	✓	✓
EP2407274-005	27-May-2024 14:44	0089_SD351_240527	✓	✓
EP2407274-006	27-May-2024 14:45	0089_SD380_240527	✓	✓

Proactive Holding Time Report

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

Requested Deliverables

[redacted]
- A4 - AU Tax Invoice (INV) — Email — [redacted]cardno.com.au

DERP LAB REPORTS
- EDI Format - ESDAT (ESDAT) — Email — derp.labreports@esdat.com.au

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

CERTIFICATE OF ANALYSIS

Work Order	: **EP2407274**	Page	: 1 of 7
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: [redacted]
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: +61-8-9406 1301
Project	: WA_0089_PFASOMP_24	Date Samples Received	: 28-May-2024 13:20
Order number	: pfas-omp/Stirling	Date Analysis Commenced	: 05-Jun-2024
C-O-C number	: 68226	Issue Date	: 10-Jun-2024 12:58
Sampler	: [redacted]		
Site	: Stirling SD - CG		
Quote number	: SY/139/19 B		
No. of samples received	: 6		
No. of samples analysed	: 6		

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]	Laboratory Manager (Perth)	Perth Inorganics, Wangara, WA
[redacted]	Senior Organic Chemist	Perth Organics, Wangara, WA

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.

- 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 USEPA 1633 limits 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: SEDIMENT (Matrix: SOIL)				Sample ID	0089_SD350_240527	0089_SD381_240527	0089_SD401_240527	0089_SD352_240527	0089_SD351_240527
				Sampling date / time	27-May-2024 14:43	27-May-2024 14:43	27-May-2024 14:44	27-May-2024 14:44	27-May-2024 14:44
Compound	CAS Number	LOR	Unit		EP2407274-001	EP2407274-002	EP2407274-003	EP2407274-004	EP2407274-005
					Result	Result	Result	Result	Result
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content	----	0.1	%		**23.1**	**23.6**	**19.7**	**22.0**	**6.1**
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg		<0.001	<0.001	<0.001	<0.001	<0.001
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002

Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)				Sample ID	0089_SD350_240527	0089_SD381_240527	0089_SD401_240527	0089_SD352_240527	0089_SD351_240527
				Sampling date / time	27-May-2024 14:43	27-May-2024 14:43	27-May-2024 14:44	27-May-2024 14:44	27-May-2024 14:44
Compound	CAS Number	LOR	Unit		EP2407274-001	EP2407274-002	EP2407274-003	EP2407274-004	EP2407274-005
					Result	Result	Result	Result	Result
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
EP231P: PFAS Sums									
Sum of PFAS	----	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Sum of PFAS (WA DER List)	----	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.0002	%		**93.0**	**99.0**	**95.5**	**102**	**91.5**
13C8-PFOA	----	0.0002	%		**106**	**104**	**106**	**108**	**110**

Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)				Sample ID	0089_SD380_240527	----	----	----	----
				Sampling date / time	27-May-2024 14:45	----	----	----	----
Compound	CAS Number	LOR	Unit		EP2407274-006	--------	--------	--------	--------
					Result	----	----	----	----
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content	----	0.1	%		**23.1**	----	----	----	----
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg		<0.0002	----	----	----	----
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg		<0.0002	----	----	----	----
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg		<0.0002	----	----	----	----
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg		<0.0002	----	----	----	----
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg		<0.0002	----	----	----	----
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg		<0.0002	----	----	----	----
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg		<0.001	----	----	----	----
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg		<0.0002	----	----	----	----
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg		<0.0002	----	----	----	----
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg		<0.0002	----	----	----	----
Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg		<0.0002	----	----	----	----
Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg		<0.0002	----	----	----	----
Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg		<0.0002	----	----	----	----
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg		<0.0002	----	----	----	----
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg		<0.0002	----	----	----	----
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg		<0.0002	----	----	----	----
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg		<0.0005	----	----	----	----
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg		<0.0002	----	----	----	----

Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)				Sample ID	0089_SD380_240527	----	----	----	----
				Sampling date / time	27-May-2024 14:45	----	----	----	----
Compound	CAS Number	LOR	Unit		EP2407274-006	--------	--------	--------	--------
					Result	----	----	----	----
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg		<0.0005	----	----	----	----
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg		<0.0005	----	----	----	----
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg		<0.0005	----	----	----	----
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg		<0.0005	----	----	----	----
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg		<0.0002	----	----	----	----
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg		<0.0002	----	----	----	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg		<0.0005	----	----	----	----
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg		<0.0005	----	----	----	----
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg		<0.0005	----	----	----	----
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg		<0.0005	----	----	----	----
EP231P: PFAS Sums									
Sum of PFAS	----	0.0002	mg/kg		<0.0002	----	----	----	----
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg		<0.0002	----	----	----	----
Sum of PFAS (WA DER List)	----	0.0002	mg/kg		<0.0002	----	----	----	----
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.0002	%		**95.0**	----	----	----	----
13C8-PFOA	----	0.0002	%		**104**	----	----	----	----

Surrogate Control Limits

Sub-Matrix: **SEDIMENT**		Recovery Limits (%)	
Compound	*CAS Number*	*Low*	*High*
EP231S: PFAS Surrogate			
13C4-PFOS	----	76	136
13C8-PFOA	----	78	131

QUALITY CONTROL REPORT

Work Order	: **EP2407274**	Page	: 1 of 7
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: [redacted]
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: +61-8-9406 1301
Project	: WA_0089_PFASOMP_24	Date Samples Received	: 28-May-2024
Order number	: pfas-omp/Stirling	Date Analysis Commenced	: 05-Jun-2024
C-O-C number	: 68226	Issue Date	: 10-Jun-2024
Sampler	: [redacted] [redacted]		
Site	: Stirling SD - CG		
Quote number	: SY/139/19 B		
No. of samples received	: 6		
No. of samples analysed	: 6		

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]	Laboratory Manager (Perth)	Perth Inorganics, Wangara, WA
[redacted]	Senior Organic Chemist	Perth Organics, Wangara, WA

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: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
EA055: Moisture Content (Dried @ 105-110°C) (QC Lot: 5836314)									
EP2407274-001	0089_SD350_240527	EA055: Moisture Content	----	0.1	%	23.1	21.7	6.1	0% - 20%
EP2407314-005	Anonymous	EA055: Moisture Content	----	0.1	%	15.5	17.0	9.2	0% - 20%
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 5834296)									
EP2407274-001	0089_SD350_240527	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
EP2407314-005	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 5834296)									
EP2407274-001	0089_SD350_240527	EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit

Sub-Matrix: **SOIL**

				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: 5834296) - continued									
EP2407274-001	0089_SD350_240527	EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	<0.001	0.0	No Limit
EP2407314-005	Anonymous	EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	<0.001	0.0	No Limit
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 5834296)									
EP2407274-001	0089_SD350_240527	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
EP2407314-005	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit

Sub-Matrix: **SOIL**

				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: 5834296) - continued									
EP2407314-005	Anonymous	EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 5834296)									
EP2407274-001	0089_SD350_240527	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
EP2407314-005	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
EP231P: PFAS Sums (QC Lot: 5834296)									
EP2407274-001	0089_SD350_240527	EP231X: Sum of PFAS	----	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Sum of PFAS (WA DER List)	----	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
EP2407314-005	Anonymous	EP231X: Sum of PFAS	----	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Sum of PFAS (WA DER List)	----	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit

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: **SOIL**

				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: 5834296)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	0.0011 mg/kg	94.5	72.0	128
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	0.00125 mg/kg	78.8	73.0	123
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	0.00118 mg/kg	89.0	67.0	130
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	0.00119 mg/kg	96.2	70.0	132
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	0.00116 mg/kg	87.9	68.0	136
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	0.0012 mg/kg	95.0	59.0	134
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5834296)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	0.00625 mg/kg	96.2	71.0	135
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	0.00125 mg/kg	95.2	69.0	132
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	0.00125 mg/kg	104	70.0	132
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	0.00125 mg/kg	94.4	71.0	131
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	99.6	69.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	102	72.0	129
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	0.00125 mg/kg	98.4	69.0	133
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	100	64.0	136
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	96.4	69.0	135
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	102	66.0	139
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	0.00125 mg/kg	102	69.0	133
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5834296)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	0.00125 mg/kg	97.2	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	0.00312 mg/kg	92.0	59.6	143
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	0.00312 mg/kg	102	62.8	140
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	0.00312 mg/kg	92.5	61.5	139
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	0.00312 mg/kg	89.9	61.9	139
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	0.00125 mg/kg	89.6	63.0	144
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	0.00125 mg/kg	109	61.0	139
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5834296)								

Sub-Matrix: **SOIL**

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: 5834296) - continued								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	0.00117 mg/kg	105	62.0	145
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	0.00118 mg/kg	101	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	0.0012 mg/kg	104	65.0	137
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	0.0012 mg/kg	104	54.8	124
EP231P: PFAS Sums (QCLot: 5834296)								
EP231X: Sum of PFAS	----	0.0002	mg/kg	<0.0002	----	----	----	----
EP231X: Sum of PFHxS and PFOS	355-46-4/17 63-23-1	0.0002	mg/kg	<0.0002	----	----	----	----
EP231X: Sum of PFAS (WA DER List)	----	0.0002	mg/kg	<0.0002	----	----	----	----

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: **SOIL**

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: 5834296)							
EP2407274-002	0089_SD381_240527	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0011 mg/kg	89.5	72.0	128
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.00117 mg/kg	78.6	73.0	123
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.00118 mg/kg	84.2	67.0	130
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.00119 mg/kg	95.4	70.0	132
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.00116 mg/kg	86.5	68.0	136
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0012 mg/kg	98.4	59.0	134
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5834296)							
EP2407274-002	0089_SD381_240527	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.00625 mg/kg	87.1	71.0	135
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.00125 mg/kg	94.4	69.0	132
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.00125 mg/kg	109	70.0	132
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.00125 mg/kg	91.6	71.0	131
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.00125 mg/kg	106	69.0	133
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.00125 mg/kg	93.5	72.0	129
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.00125 mg/kg	100	69.0	133
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.00125 mg/kg	98.8	64.0	136
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.00125 mg/kg	98.4	69.0	135
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.00125 mg/kg	108	66.0	139
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.00125 mg/kg	104	69.0	133
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5834296)							

Sub-Matrix: **SOIL**

				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: 5834296) - continued							
EP2407274-002	0089_SD381_240527	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.00125 mg/kg	91.9	48.0	128
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.00312 mg/kg	93.8	60.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.00312 mg/kg	90.9	60.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.00312 mg/kg	115	60.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.00312 mg/kg	90.1	60.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.00125 mg/kg	92.8	63.0	144
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.00125 mg/kg	105	61.0	139
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5834296)							
EP2407274-002	0089_SD381_240527	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.00117 mg/kg	97.9	62.0	145
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.00118 mg/kg	100	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0012 mg/kg	98.8	65.0	137
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0012 mg/kg	94.6	60.0	130

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **EP2407274**	Page	: 1 of 4
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Telephone	: +61-8-9406 1301
Project	: WA_0089_PFASOMP_24	Date Samples Received	: 28-May-2024
Site	: Stirling SD - CG	Issue Date	: 10-Jun-2024
Sampler	: [redacted] [redacted]	No. of samples received	: 6
Order number	: pfas-omp/Stirling	No. of samples analysed	: 6

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, where applicable to the methodology, 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: **SOIL**

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
EA055: Moisture Content (Dried @ 105-110°C)							
HDPE Soil Jar (EA055)							
0089_SD350_240527, 0089_SD381_240527, 0089_SD401_240527, 0089_SD352_240527, 0089_SD351_240527, 0089_SD380_240527	**27-May-2024**	**----**	----	----	**05-Jun-2024**	10-Jun-2024	✓
EP231A: Perfluoroalkyl Sulfonic Acids							
HDPE Soil Jar (EP231X)							
0089_SD350_240527, 0089_SD381_240527, 0089_SD401_240527, 0089_SD352_240527, 0089_SD351_240527, 0089_SD380_240527	**27-May-2024**	**06-Jun-2024**	23-Nov-2024	✓	**07-Jun-2024**	16-Jul-2024	✓
EP231B: Perfluoroalkyl Carboxylic Acids							
HDPE Soil Jar (EP231X)							
0089_SD350_240527, 0089_SD381_240527, 0089_SD401_240527, 0089_SD352_240527, 0089_SD351_240527, 0089_SD380_240527	**27-May-2024**	**06-Jun-2024**	23-Nov-2024	✓	**07-Jun-2024**	16-Jul-2024	✓
EP231C: Perfluoroalkyl Sulfonamides							
HDPE Soil Jar (EP231X)							
0089_SD350_240527, 0089_SD381_240527, 0089_SD401_240527, 0089_SD352_240527, 0089_SD351_240527, 0089_SD380_240527	**27-May-2024**	**06-Jun-2024**	23-Nov-2024	✓	**07-Jun-2024**	16-Jul-2024	✓
EP231D: (n:2) Fluorotelomer Sulfonic Acids							
HDPE Soil Jar (EP231X)							
0089_SD350_240527, 0089_SD381_240527, 0089_SD401_240527, 0089_SD352_240527, 0089_SD351_240527, 0089_SD380_240527	**27-May-2024**	**06-Jun-2024**	23-Nov-2024	✓	**07-Jun-2024**	16-Jul-2024	✓
EP231P: PFAS Sums							
HDPE Soil Jar (EP231X)							
0089_SD350_240527, 0089_SD381_240527, 0089_SD401_240527, 0089_SD352_240527, 0089_SD351_240527, 0089_SD380_240527	**27-May-2024**	**06-Jun-2024**	23-Nov-2024	✓	**07-Jun-2024**	16-Jul-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: **SOIL**

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)							
Moisture Content	EA055	2	18	**11.11**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	20	**5.00**	**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
Moisture Content	EA055	SOIL	In house: A gravimetric procedure based on weight loss over a 12 hour drying period at 105-110 degrees C. This method is compliant with NEPM Schedule B(3).
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	SOIL	In-house: Analysis of soils by solvent extraction followed by LC-Electrospray-MS-MS, Negative Mode using MRM using internal standard quantitation. Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to a portion of soil which is then extracted with MTBE and an ion pairing reagent. A portion of extract is exchanged into the analytical solvent mixture, combined with an equal volume reagent water and 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
QuECheRS Extraction of Solids	* ORG71	SOIL	In house: Sequential extractions with Acetonitrile/Methanol by shaking. Extraction efficiency aided by the addition of salts under acidic conditions. Where relevant, interferences from co-extracted organics are removed with dispersive clean-up media (dSPE). The extract is either diluted or concentrated and exchanged into the analytical solvent.

ALSCompass
SAMPLING *Intelligence*

ALS

Environmental Division
Perth
Work Order Reference
EP2407275

Telephone : +61-8-9406 1301

Custody Document for Submissions via ALS Compass App

Project: WA-0089-PPASOMP-24 Client: STANTEC Project Manager: [redacted]

Phone: ([redacted])

ALS Compass COC Reference: 68225 (68219 68227 68226 68220) # Samples: Sampler: [redacted]

Phone: ([redacted])

Turnaround Requirements: Standard ~~Standard~~ Urgent

Special Instructions:

Custody:

Relinquished by:	Received by:	Relinquished by:	Received by:
STANTEC	[redacted]		
Date / Time: 28/5/24	Date / Time: 28/5 1720	Date / Time:	Date / Time:

CHAIN OF CUSTODY

ALS COC#: 68227 ALS Laboratory: EP Perth Environmental

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

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP_24

SITE: Stirling SW/PW - CG

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]derp.labreports@esdat.com.au

EMAIL INVOICES 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	WA OMP Water Suite WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
001	0089_PW381		27/05/2024 02:45 PM	WATER	ALS: 3 Non ALS: 0	No	X		
002	0089_PW352		27/05/2024 02:46 PM	WATER	ALS: 3 Non ALS: 0	No	X		
003	0089_PW350		27/05/2024 02:46 PM	WATER	ALS: 3 Non ALS: 0	No	X		
004	0089_PW401		27/05/2024 02:47 PM	WATER	ALS: 3 Non ALS: 0	No	X		
005	0089_PW380		27/05/2024 02:48 PM	WATER	ALS: 3 Non ALS: 0	No	X		

CHAIN OF CUSTODY

ALS COC#: 68227 *ALS Laboratory:* EP Perth Environmental

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

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP_24

SITE: Stirling SW/PW - CG

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]derp.labreports@esdat.com.au

EMAIL INVOICES 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	0089_PW381	HDPE (no PTFE)	20 mL	00351221024788	Grey	No	
001	0089_PW381	HDPE (no PTFE)	20 mL	00351221024849	Grey	No	
001	0089_PW381	Clear Plastic Bottle - Natural	125 mL	00071121178049	Green	No	
002	0089_PW352	HDPE (no PTFE)	20 mL	00352312048538	Grey	No	
002	0089_PW352	HDPE (no PTFE)	20 mL	00351221024845	Grey	No	
002	0089_PW352	Clear Plastic Bottle - Natural	125 mL	00071121160984	Green	No	
003	0089_PW350	HDPE (no PTFE)	20 mL	00351221024772	Grey	No	
003	0089_PW350	HDPE (no PTFE)	20 mL	00351221024765	Grey	No	
003	0089_PW350	Clear Plastic Bottle - Natural	125 mL	00071121178063	Green	No	
004	0089_PW401	HDPE (no PTFE)	20 mL	00352312048698	Grey	No	
004	0089_PW401	HDPE (no PTFE)	20 mL	00351221024650	Grey	No	
004	0089_PW401	Clear Plastic Bottle - Natural	125 mL	00071121178103	Green	No	
005	0089_PW380	HDPE (no PTFE)	20 mL	00351221024785	Grey	No	
005	0089_PW380	HDPE (no PTFE)	20 mL	00351221024780	Grey	No	
005	0089_PW380	Clear Plastic Bottle - Natural	125 mL	00071121177994	Green	No	

Total Bottle Count: ALS: 15, Non ALS: 0

SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : **EP2407275**

Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: [redacted]
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
E-mail	: [redacted]stantec.com	E-mail	: [redacted]alsglobal.com
Telephone	: ----	Telephone	: +61-8-9406 1301
Facsimile	: ----	Facsimile	: +61-8-9406 1399
Project	: WA_0089_PFASOMP_24	Page	: 1 of 2
Order number	: pfas-omp/Stirling	Quote number	: ES2022MWHAUS0002 (SY/139/19 B)
C-O-C number	: 68227	QC Level	: NEPM 2013 B3 & ALS QC Standard
Site	: Stirling SW/PW - CG		
Sampler	: [redacted]		

Dates

Date Samples Received	: 28-May-2024 13:20	Issue Date	: 30-May-2024
Client Requested Due Date	: 10-Jun-2024	Scheduled Reporting Date	: **10-Jun-2024**

Delivery Details

Mode of Delivery	: Carrier	Security Seal	: Intact.
No. of coolers/boxes	: 1	Temperature	: 7.7 - Ice present
Receipt Detail	:	No. of samples received / analysed	: 5 / 5

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 see scanned COC for sample discrepencies: extra samples , samples not received etc.
- Please direct any queries related to sample condition / numbering / breakages to Sample Receipt (Samples.Perth@alsglobal.com)
- Analytical work for this work order will be conducted at ALS Environmental Perth.
- Please direct any turnaround / technical queries to the laboratory contact designated above.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months) from receipt of samples.
- **pH analysis should be conducted within 6 hours of sampling.**
- **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.**
- 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 (30 analytes)	WATER - NT-01 & 02 Ca, Mg, Na, K, Cl, SO4, Alkalinity
EP2407275-001	27-May-2024 14:45	0089_PW381_240527	✓	✓
EP2407275-002	27-May-2024 14:46	0089_PW352_240527	✓	✓
EP2407275-003	27-May-2024 14:46	0089_PW350_240527	✓	✓
EP2407275-004	27-May-2024 14:47	0089_PW401_240527	✓	✓
EP2407275-005	27-May-2024 14:48	0089_PW380_240527	✓	✓

Proactive Holding Time Report

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

Requested Deliverables

[redacted]
- A4 - AU Tax Invoice (INV) — Email — [redacted]cardno.com.au

DERP LAB REPORTS
- EDI Format - ESDAT (ESDAT) — Email — derp.labreports@esdat.com.au

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

CERTIFICATE OF ANALYSIS

Work Order	: **EP2407275**	Page	: 1 of 6
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: [redacted]
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: +61-8-9406 1301
Project	: WA_0089_PFASOMP_24	Date Samples Received	: 28-May-2024 13:20
Order number	: pfas-omp/Stirling	Date Analysis Commenced	: 30-May-2024
C-O-C number	: 68227	Issue Date	: 10-Jun-2024 12:59
Sampler	: [redacted] [redacted]		
Site	: Stirling SW/PW - CG		
Quote number	: SY/139/19 B		
No. of samples received	: 5		
No. of samples analysed	: 5		

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]	Inorganics Supervisor	Perth Inorganics, Wangara, WA
[redacted]	Laboratory Manager (Perth)	Perth Inorganics, Wangara, WA
[redacted]	Metals Chemist	Perth Inorganics, Wangara, WA
[redacted]	Senior Organic Chemist	Perth Organics, Wangara, WA

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.
- As per QWI – EN55-3 Data Interpreting Procedures, Ionic balances are typically calculated using Major Anions - Chloride, Alkalinity and Sulfate; and Major Cations - Calcium, Magnesium, Potassium and Sodium. Where applicable and dependent upon sample matrix, the Ionic Balance may also include the additional contribution of Ammonia, Dissolved Metals by ICPMS and H+ to the Cations and Nitrate, SiO2 and Fluoride to the Anions.
- Sodium Adsorption Ratio (where reported): Where results for Na, Ca or Mg are <LOR, a concentration at half the reported LOR is incorporated into the SAR calculation. This represents a conservative approach for Na relative to the assumption that <LOR = zero concentration and a conservative approach for Ca & Mg relative to the assumption that <LOR is equivalent to the LOR concentration.
- 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.
- ED045G: The presence of Thiocyanate, Thiosulfate and Sulfite can positively contribute to the chloride result, thereby may bias results higher than expected. Results should be scrutinised accordingly.

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_PW381_240527	0089_PW352_240527	0089_PW350_240527	0089_PW401_240527	0089_PW380_240527
				Sampling date / time	27-May-2024 14:45	27-May-2024 14:46	27-May-2024 14:46	27-May-2024 14:47	27-May-2024 14:48
Compound	CAS Number	LOR	Unit		EP2407275-001	EP2407275-002	EP2407275-003	EP2407275-004	EP2407275-005
					Result	Result	Result	Result	Result
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	<1	<1	<1	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	<1	<1	<1	<1
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		120	120	120	121	121
Total Alkalinity as CaCO3	----	1	mg/L		120	120	120	121	121
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		2530	2550	2580	2510	2520
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		18200	18400	17600	17400	17900
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		416	417	414	417	418
Magnesium	7439-95-4	1	mg/L		1370	1370	1370	1380	1380
Sodium	7440-23-5	1	mg/L		10700	10600	10600	10700	10800
Potassium	7440-09-7	1	mg/L		626	629	629	632	633
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		568	574	552	546	560
ø Total Cations	----	0.01	meq/L		615	611	610	616	620
ø Ionic Balance	----	0.01	%		3.93	3.05	4.98	6.07	5.13
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

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_PW381_240527	0089_PW352_240527	0089_PW350_240527	0089_PW401_240527	0089_PW380_240527
				Sampling date / time	27-May-2024 14:45	27-May-2024 14:46	27-May-2024 14:46	27-May-2024 14:47	27-May-2024 14:48
Compound	CAS Number	LOR	Unit		EP2407275-001	EP2407275-002	EP2407275-003	EP2407275-004	EP2407275-005
					Result	Result	Result	Result	Result
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
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									

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_PW381_240527	0089_PW352_240527	0089_PW350_240527	0089_PW401_240527	0089_PW380_240527
				Sampling date / time	27-May-2024 14:45	27-May-2024 14:46	27-May-2024 14:46	27-May-2024 14:47	27-May-2024 14:48
Compound	CAS Number	LOR	Unit		EP2407275-001	EP2407275-002	EP2407275-003	EP2407275-004	EP2407275-005
					Result	Result	Result	Result	Result
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
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	%		**96.4**	**99.5**	**93.0**	**92.5**	**94.1**
13C8-PFOA	----	0.02	%		**108**	**102**	**110**	**105**	**105**

Surrogate Control Limits

Sub-Matrix: SURFACE WATER		Recovery Limits (%)	
Compound	CAS Number	Low	High
EP231S: PFAS Surrogate			
13C4-PFOS	----	65	140
13C8-PFOA	----	71	133

QUALITY CONTROL REPORT

Work Order	: **EP2407275**	Page	: 1 of 9
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: [redacted]
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: +61-8-9406 1301
Project	: WA_0089_PFASOMP_24	Date Samples Received	: 28-May-2024
Order number	: pfas-omp/Stirling	Date Analysis Commenced	: 30-May-2024
C-O-C number	: 68227	Issue Date	: 10-Jun-2024
Sampler	: [redacted] [redacted]		
Site	: Stirling SW/PW - CG		
Quote number	: SY/139/19 B		
No. of samples received	: 5		
No. of samples analysed	: 5		

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]	Inorganics Supervisor	Perth Inorganics, Wangara, WA
[redacted]	Laboratory Manager (Perth)	Perth Inorganics, Wangara, WA
[redacted]	Metals Chemist	Perth Inorganics, Wangara, WA
[redacted]	Senior Organic Chemist	Perth Organics, Wangara, WA

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 (%)
ED037P: Alkalinity by PC Titrator (QC Lot: 5828136)									
EP2407272-002	Anonymous	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	120	120	0.0	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	120	120	0.0	0% - 20%
EP2407273-007	Anonymous	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	359	358	0.0	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	359	358	0.0	0% - 20%
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QC Lot: 5827147)									
EP2407275-001	0089_PW381_240527	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	2530	2570	1.6	0% - 20%
EP2407316-007	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	2280	2260	0.8	0% - 20%
ED045G: Chloride by Discrete Analyser (QC Lot: 5827148)									
EP2407275-001	0089_PW381_240527	ED045G: Chloride	16887-00-6	1	mg/L	18200	17600	3.1	0% - 20%
EP2407316-007	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	17800	17200	3.0	0% - 20%
ED093F: Dissolved Major Cations (QC Lot: 5826269)									
EP2407272-001	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	425	410	3.7	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	1410	1360	3.7	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	11000	10600	4.0	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	643	620	3.7	0% - 20%
EP2407273-007	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	109	110	0.0	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	60	60	0.0	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	181	181	0.0	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 (%)*
ED093F: Dissolved Major Cations (QC Lot: 5826269) - continued									
EP2407273-007	Anonymous	ED093F: Potassium	7440-09-7	1	mg/L	13	13	0.0	0% - 50%
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 5834859)									
EP2407306-007	Anonymous	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
EP2407306-009	Anonymous	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
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 5834859)									
EP2407306-007	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
EP2407306-009	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

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: 5834859)									
EP2407306-007	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
EP2407306-009	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: 5834859)									
EP2407306-007	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
EP2407306-009	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

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: 5834859) - continued									
EP2407306-009	Anonymous	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: 5834859)									
EP2407306-007	Anonymous	EP231X: Sum of PFAS	----	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	<0.01	<0.01	0.0	No Limit
EP2407306-009	Anonymous	EP231X: Sum of PFAS	----	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	<0.01	<0.01	0.0	No Limit

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
ED037P: Alkalinity by PC Titrator (QCLot: 5828136)								
ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	----	----	----	----
ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	----	----	----	----
ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	<1	----	----	----	----
ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	<1	20 mg/L	92.9	85.1	126
				<1	200 mg/L	97.6	90.5	111
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 5827147)								
ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<1	25 mg/L	99.3	89.9	112
				<1	500 mg/L	104	89.9	112
ED045G: Chloride by Discrete Analyser (QCLot: 5827148)								
ED045G: Chloride	16887-00-6	1	mg/L	<1	10 mg/L	102	88.6	113
				<1	1000 mg/L	101	88.6	113
ED093F: Dissolved Major Cations (QCLot: 5826269)								
ED093F: Calcium	7440-70-2	1	mg/L	<1	50 mg/L	96.2	86.5	117
ED093F: Magnesium	7439-95-4	1	mg/L	<1	50 mg/L	97.9	88.4	110
ED093F: Sodium	7440-23-5	1	mg/L	<1	50 mg/L	96.2	91.4	113
ED093F: Potassium	7440-09-7	1	mg/L	<1	50 mg/L	93.2	84.6	108
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5834859)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.2218 µg/L	100	72.0	130
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.2352 µg/L	81.0	71.0	127
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	0.2373 µg/L	84.3	68.0	131
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.238 µg/L	94.3	69.0	134
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.232 µg/L	92.0	65.0	140
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.241 µg/L	95.6	53.0	142
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5834859)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	1.25 µg/L	89.7	73.0	129
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	0.25 µg/L	94.4	72.0	129
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	0.25 µg/L	106	72.0	129
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	0.25 µg/L	98.0	72.0	130
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	0.25 µg/L	91.8	71.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	0.25 µg/L	95.4	69.0	130

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
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5834859) - continued								
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	0.25 µg/L	97.2	71.0	129
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	0.25 µg/L	90.8	69.0	133
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	0.25 µg/L	98.4	72.0	134
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	0.25 µg/L	108	65.0	144
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	0.25 µg/L	94.2	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5834859)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.25 µg/L	88.2	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	0.625 µg/L	92.0	68.0	141
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	0.625 µg/L	97.0	60.5	138
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	0.625 µg/L	85.2	68.3	134
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	0.625 µg/L	100	62.2	138
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	0.25 µg/L	90.6	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
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5834859)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.2343 µg/L	94.5	63.0	143
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	0.2378 µg/L	105	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	0.24 µg/L	96.2	67.0	138
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	0.241 µg/L	99.4	64.2	133
EP231P: PFAS Sums (QCLot: 5834859)								
EP231X: Sum of PFAS	----	0.01	µg/L	<0.01	----	----	----	----
EP231X: Sum of PFHxS and PFOS	355-46-4/17 63-23-1	0.01	µg/L	<0.01	----	----	----	----
EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	<0.01	----	----	----	----

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
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 5827147)							
EP2407275-001	0089_PW381_240527						

Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 5827147) - continued							
EP2407275-001	0089_PW381_240527	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	100 mg/L	# Not Determined	70.4	130
ED045G: Chloride by Discrete Analyser (QCLot: 5827148)							
EP2407275-001	0089_PW381_240527	ED045G: Chloride	16887-00-6	200 mg/L	# Not Determined	70.0	130
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5834859)							
EP2407306-008	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.2218 µg/L	99.2	72.0	129
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.232 µg/L	83.0	71.0	127
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.2352 µg/L	88.8	68.0	129
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.238 µg/L	101	69.0	134
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.232 µg/L	88.8	65.0	140
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.241 µg/L	90.7	53.0	129
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5834859)							
EP2407306-008	Anonymous	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	1.25 µg/L	84.3	73.0	142
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.25 µg/L	92.0	72.0	129
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.25 µg/L	111	72.0	129
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.25 µg/L	99.4	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	94.6	69.0	130
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.25 µg/L	98.2	71.0	134
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.25 µg/L	98.0	69.0	133
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.25 µg/L	102	72.0	134
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.25 µg/L	109	65.0	144
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.25 µg/L	107	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5834859)							
EP2407306-008	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.25 µg/L	94.6	59.0	135
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.625 µg/L	91.4	70.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.625 µg/L	103	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.625 µg/L	88.2	70.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.625 µg/L	93.0	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.25 µg/L	93.4	65.0	136
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.25 µg/L	107	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5834859)							

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: 5834859) - continued							
EP2407306-008	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.234 µg/L	98.5	63.0	143
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.2378 µg/L	104	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.24 µg/L	101	67.0	138
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.2415 µg/L	97.1	70.0	130

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **EP2407275**	Page	: 1 of 5
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Telephone	: +61-8-9406 1301
Project	: WA_0089_PFASOMP_24	Date Samples Received	: 28-May-2024
Site	: Stirling SW/PW - CG	Issue Date	: 10-Jun-2024
Sampler	: [redacted] [redacted]	No. of samples received	: 5
Order number	: pfas-omp/Stirling	No. of samples analysed	: 5

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.**
- **Matrix Spike outliers exist - please see following pages for full details.**
- **For all regular sample matrices, where applicable to the methodology, 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.**

Outliers : Quality Control Samples

Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

Matrix: **WATER**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
Matrix Spike (MS) Recoveries							
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA	EP2407275--001	0089_PW381_240527	**Sulfate as SO4 - Turbidimetric**	14808-79-8	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
ED045G: Chloride by Discrete Analyser	EP2407275--001	0089_PW381_240527	**Chloride**	16887-00-6	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**

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
ED037P: Alkalinity by PC Titrator							
Clear Plastic Bottle - Natural (ED037-P) 0089_PW381_240527, 0089_PW352_240527, 0089_PW350_240527, 0089_PW401_240527, 0089_PW380_240527	**27-May-2024**	**----**	----	**----**	**31-May-2024**	10-Jun-2024	✓
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA							
Clear Plastic Bottle - Natural (ED041G) 0089_PW381_240527, 0089_PW352_240527, 0089_PW350_240527, 0089_PW401_240527, 0089_PW380_240527	**27-May-2024**	**----**	----	**----**	**07-Jun-2024**	24-Jun-2024	✓
ED045G: Chloride by Discrete Analyser							
Clear Plastic Bottle - Natural (ED045G) 0089_PW381_240527, 0089_PW352_240527, 0089_PW350_240527, 0089_PW401_240527, 0089_PW380_240527	**27-May-2024**	**----**	----	**----**	**07-Jun-2024**	24-Jun-2024	✓
ED093F: Dissolved Major Cations							
Clear Plastic Bottle - Natural (ED093F) 0089_PW381_240527, 0089_PW352_240527, 0089_PW350_240527, 0089_PW401_240527, 0089_PW380_240527	**27-May-2024**	**----**	----	**----**	**31-May-2024**	03-Jun-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
EP231A: Perfluoroalkyl Sulfonic Acids							
HDPE (no PTFE) (EP231X)							
0089_PW381_240527, 0089_PW352_240527, 0089_PW350_240527, 0089_PW401_240527, 0089_PW380_240527	**27-May-2024**	**04-Jun-2024**	23-Nov-2024	✓	**07-Jun-2024**	23-Nov-2024	✓
EP231B: Perfluoroalkyl Carboxylic Acids							
HDPE (no PTFE) (EP231X)							
0089_PW381_240527, 0089_PW352_240527, 0089_PW350_240527, 0089_PW401_240527, 0089_PW380_240527	**27-May-2024**	**04-Jun-2024**	23-Nov-2024	✓	**07-Jun-2024**	23-Nov-2024	✓
EP231C: Perfluoroalkyl Sulfonamides							
HDPE (no PTFE) (EP231X)							
0089_PW381_240527, 0089_PW352_240527, 0089_PW350_240527, 0089_PW401_240527, 0089_PW380_240527	**27-May-2024**	**04-Jun-2024**	23-Nov-2024	✓	**07-Jun-2024**	23-Nov-2024	✓
EP231D: (n:2) Fluorotelomer Sulfonic Acids							
HDPE (no PTFE) (EP231X)							
0089_PW381_240527, 0089_PW352_240527, 0089_PW350_240527, 0089_PW401_240527, 0089_PW380_240527	**27-May-2024**	**04-Jun-2024**	23-Nov-2024	✓	**07-Jun-2024**	23-Nov-2024	✓
EP231P: PFAS Sums							
HDPE (no PTFE) (EP231X)							
0089_PW381_240527, 0089_PW352_240527, 0089_PW350_240527, 0089_PW401_240527, 0089_PW380_240527	**27-May-2024**	**04-Jun-2024**	23-Nov-2024	✓	**07-Jun-2024**	23-Nov-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)							
Alkalinity by Auto Titrator	ED037-P	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	18	**11.11**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Alkalinity by Auto Titrator	ED037-P	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	18	**5.56**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Alkalinity by Auto Titrator	ED037-P	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	18	**5.56**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Chloride by Discrete Analyser	ED045G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	18	**5.56**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	20	**5.00**	**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
Alkalinity by Auto Titrator	ED037-P	WATER	In house: Referenced to APHA 2320 B This procedure determines alkalinity by automated measurement (e.g. PC Titrate) on a settled supernatant aliquot of the sample using pH 4.5 for indicating the total alkalinity end-point. This method is compliant with NEPM Schedule B(3)
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	WATER	In house: Referenced to APHA 4500-SO4. Dissolved sulfate is determined in a 0.45um filtered sample. Sulfate ions are converted to a barium sulfate suspension in an acetic acid medium with barium chloride. Light absorbance of the BaSO4 suspension is measured by a photometer and the SO4-2 concentration is determined by comparison of the reading with a standard curve. This method is compliant with NEPM Schedule B(3)
Chloride by Discrete Analyser	ED045G	WATER	In house: Referenced to APHA 4500 Cl - G.The thiocyanate ion is liberated from mercuric thiocyanate through sequestration of mercury by the chloride ion to form non-ionised mercuric chloride. In the presence of ferric ions the liberated thiocynate forms highly-coloured ferric thiocynate which is measured at 480 nm.
Major Cations - Dissolved	ED093F	WATER	In house: Referenced to APHA 3120 and 3125; USEPA SW 846 - 6010 and 6020; Cations are determined by either ICP-AES or ICP-MS techniques. This method is compliant with NEPM Schedule B(3) Sodium Adsorption Ratio is calculated from Ca, Mg and Na which determined by ALS in house method QWI-EN/ED093F. This method is compliant with NEPM Schedule B(3) Hardness parameters are calculated based on APHA 2340 B. This method is compliant with NEPM Schedule B(3)
Ionic Balance by PCT DA and Turbi SO4 DA	* EN055 - PG	WATER	In house: Referenced to APHA 1030F. This method is compliant with NEPM Schedule B(3)
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.

ALSCompass
SAMPLING *Intelligence*

ALS

Environmental Division
Perth
Work Order Reference
EP2407306

Telephone : +61-8-9406 1301

Custody Document for Submissions via ALS Compass App

Project: WA-0089-PFASOMP-24 Client: STANTEC Project Manager: [redacted]

Phone: ( )

ALS Compass COC Reference: 68219 68227 68226 68220 68225 # Samples: Sampler: [redacted]

Phone: ( )

Turnaround Requirements: (Standard) Urgent

Special Instructions:

Custody:

Relinquished by: STANTEC	Received by: [redacted]	Relinquished by:	Received by:
Date / Time: 28/5/24	Date / Time: 29/5 1720	Date / Time:	Date / Time:

CHAIN OF CUSTODY

COC#: 68219 ALS Laboratory: EP Perth Environmental

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

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP_24

SITE: Stirling GW - MB

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]derp.labreports@esdat.com.au

EMAIL INVOICES 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	Rinsate WATER	WA OMP Water Suite WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
001	0089_MW158		27/05/2024 11:05 AM	WATER	ALS: 3 Non ALS: 0	No		X		
002	0089_MW166		27/05/2024 11:35 AM	WATER	ALS: 5 Non ALS: 0	No		X		
003	0089_QC101		27/05/2024 11:37 AM	WATER	ALS: 2 Non ALS: 0	No	X			
004	0089_MW171		27/05/2024 12:06 PM	WATER	ALS: 3 Non ALS: 0	No		X		
005	0089_MW172		27/05/2024 12:48 PM	WATER	ALS: 3 Non ALS: 0	No		X		
006	0089_QC104		27/05/2024 12:48 PM	WATER	ALS: 2 Non ALS: 0	No	X			
007	0089_QC301			WATER	ALS: 0 Non ALS: 0	No	X			

CHAIN OF CUSTODY

COC#: **68219** *ALS Laboratory:* EP Perth Environmental

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

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP_24

SITE: Stirling GW - MB

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]derp.labreports@esdat.com.au

EMAIL INVOICES 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	Rinsate WATER	WA OMP Water Suite WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
008	0089_QC302			WATER	ALS: 0 Non ALS: 0	No	X			
009	0089_QC401			WATER	ALS: 0 Non ALS: 0	No	X			
010	0089_QC402			WATER	ALS: 0 Non ALS: 0	No	X			

CHAIN OF CUSTODY

COC#: 68219 *ALS Laboratory:* EP Perth Environmental

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

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP_24

SITE: Stirling GW - MB

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]derp.labreports@esdat.com.au

EMAIL INVOICES 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	0089_MW158	Clear Plastic Bottle - Natural	125 mL	00071121177943	Green	No	
001	0089_MW158	HDPE (no PTFE)	20 mL	00351221024790	Grey	No	
001	0089_MW158	HDPE (no PTFE)	20 mL	00351221024840	Grey	No	
002	0089_MW166	Clear Plastic Bottle - Natural	125 mL	00071121178067	Green	No	
002	0089_MW166	HDPE (no PTFE)	20 mL	00351221024841	Grey	No	
002	0089_MW166	HDPE (no PTFE)	20 mL	00351221024815	Grey	No	
002	0089_MW166	HDPE (no PTFE)	20 mL	00351221027225	Grey	No	
002	0089_MW166	HDPE (no PTFE)	20 mL	00351221027326	Grey	No	
003	0089_QC101	HDPE (no PTFE)	20 mL	00352312048760	Grey	No	
003	0089_QC101	HDPE (no PTFE)	20 mL	00352312048638	Grey	No	
004	0089_MW171	HDPE (no PTFE)	20 mL	00351221024661	Grey	No	
004	0089_MW171	HDPE (no PTFE)	20 mL	00351221024602	Grey	No	
004	0089_MW171	Clear Plastic Bottle - Natural	125 mL	00071121178096	Green	No	
005	0089_MW172	HDPE (no PTFE)	20 mL	00351221024685	Grey	No	
005	0089_MW172	HDPE (no PTFE)	20 mL	00352312048540	Grey	No	
005	0089_MW172	Clear Plastic Bottle - Natural	125 mL	00071121161004	Green	No	
006	0089_QC104	HDPE (no PTFE)	20 mL	00352312048488	Grey	No	
006	0089_QC104	HDPE (no PTFE)	20 mL	00352312048612	Grey	No	

Total Bottle Count: ALS: 18, Non ALS: 0

SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : **EP2407306**

Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: [redacted]
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
E-mail	: [redacted]stantec.com	E-mail	: [redacted]alsglobal.com
Telephone	: ----	Telephone	: +61-8-9406 1301
Facsimile	: ----	Facsimile	: +61-8-9406 1399
Project	: WA_0089_PFASOMP_24	Page	: 1 of 2
Order number	: pfas-omp/Stirling	Quote number	: ES2022MWHAUS0002 (SY/139/19 B)
C-O-C number	: 68219	QC Level	: NEPM 2013 B3 & ALS QC Standard
Site	: Stirling GW - MB		
Sampler	: [redacted]		

Dates

Date Samples Received	: 28-May-2024 13:20	Issue Date	: 30-May-2024
Client Requested Due Date	: 10-Jun-2024	Scheduled Reporting Date	: **10-Jun-2024**

Delivery Details

Mode of Delivery	: Carrier	Security Seal	: Intact.
No. of coolers/boxes	: 1	Temperature	: 7.7 - Ice present
Receipt Detail	:	No. of samples received / analysed	: 10 / 10

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 see scanned COC for sample discrepencies: extra samples , samples not received etc.
- Please direct any queries related to sample condition / numbering / breakages to Sample Receipt (Samples.Perth@alsglobal.com)
- Analytical work for this work order will be conducted at ALS Environmental Perth.
- Please direct any turnaround / technical queries to the laboratory contact designated above.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months) from receipt of samples.
- **pH analysis should be conducted within 6 hours of sampling.**
- **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.**
- 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 (30 analytes)	WATER - NT-01 & 02 Ca, Mg, Na, K, Cl, SO4, Alkalinity
EP2407306-001	27-May-2024 11:05	0089_MW158_240527	✓	✓
EP2407306-002	27-May-2024 11:35	0089_MW166_240527	✓	✓
EP2407306-003	27-May-2024 11:37	0089_QC101_240527	✓	
EP2407306-004	27-May-2024 12:06	0089_MW171_240527	✓	✓
EP2407306-005	27-May-2024 12:48	0089_MW172_240527	✓	✓
EP2407306-006	27-May-2024 12:48	0089_QC104_240527	✓	
EP2407306-007	27-May-2024 14:58	0089_QC301_240527	✓	
EP2407306-008	27-May-2024 14:58	0089_QC302_240527	✓	
EP2407306-009	27-May-2024 14:59	0089_QC401_240527	✓	
EP2407306-010	27-May-2024 14:59	0089_QC402_240527	✓	

Proactive Holding Time Report

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

Requested Deliverables

[redacted]
- A4 - AU Tax Invoice (INV) — Email — [redacted]cardno.com.au

DERP LAB REPORTS
- EDI Format - ESDAT (ESDAT) — Email — derp.labreports@esdat.com.au

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

CERTIFICATE OF ANALYSIS

Work Order	: **EP2407306**	Page	: 1 of 10
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: [redacted]
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: +61-8-9406 1301
Project	: WA_0089_PFASOMP_24	Date Samples Received	: 28-May-2024 13:20
Order number	: pfas-omp/Stirling	Date Analysis Commenced	: 30-May-2024
C-O-C number	: 68219	Issue Date	: 10-Jun-2024 15:57
Sampler	: [redacted]		
Site	: Stirling GW - MB		
Quote number	: SY/139/19 B		
No. of samples received	: 10		
No. of samples analysed	: 10		

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]	Laboratory Manager (Perth)	Perth Inorganics, Wangara, WA
[redacted]	Metals Chemist	Perth Inorganics, Wangara, WA
[redacted]	Senior Organic Chemist	Perth Organics, Wangara, WA

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.
- As per QWI – EN55-3 Data Interpreting Procedures, Ionic balances are typically calculated using Major Anions - Chloride, Alkalinity and Sulfate; and Major Cations - Calcium, Magnesium, Potassium and Sodium. Where applicable and dependent upon sample matrix, the Ionic Balance may also include the additional contribution of Ammonia, Dissolved Metals by ICPMS and H+ to the Cations and Nitrate, SiO2 and Fluoride to the Anions.
- Sodium Adsorption Ratio (where reported): Where results for Na, Ca or Mg are <LOR, a concentration at half the reported LOR is incorporated into the SAR calculation. This represents a conservative approach for Na relative to the assumption that <LOR = zero concentration and a conservative approach for Ca & Mg relative to the assumption that <LOR is equivalent to the LOR concentration.
- 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.
- ED045G: The presence of Thiocyanate, Thiosulfate and Sulfite can positively contribute to the chloride result, thereby may bias results higher than expected. Results should be scrutinised accordingly.

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW158_240527	0089_MW166_240527	0089_QC101_240527	0089_MW171_240527	0089_MW172_240527
				Sampling date / time	27-May-2024 11:05	27-May-2024 11:35	27-May-2024 11:37	27-May-2024 12:06	27-May-2024 12:48
Compound	CAS Number	LOR	Unit		EP2407306-001	EP2407306-002	EP2407306-003	EP2407306-004	EP2407306-005
					Result	Result	Result	Result	Result
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	<1	----	<1	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	<1	----	<1	<1
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		441	660	----	458	386
Total Alkalinity as CaCO3	----	1	mg/L		441	660	----	458	386
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		495	153	----	277	190
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		4220	1160	----	1660	1080
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		207	152	----	113	100
Magnesium	7439-95-4	1	mg/L		346	134	----	188	120
Sodium	7440-23-5	1	mg/L		2340	670	----	1030	647
Potassium	7440-09-7	1	mg/L		111	59	----	69	52
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		138	49.1	----	61.7	42.1
ø Total Cations	----	0.01	meq/L		143	49.3	----	67.7	44.3
ø Ionic Balance	----	0.01	%		1.87	0.17	----	4.58	2.55
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		<0.02	0.08	0.08	1.28	1.43
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		<0.02	0.03	0.03	0.73	0.97
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		<0.01	1.59	1.62	5.71	9.33
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		<0.02	0.49	0.50	0.97	2.21
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		<0.01	5.61	6.11	2.19	8.89
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW158_240527	0089_MW166_240527	0089_QC101_240527	0089_MW171_240527	0089_MW172_240527
				Sampling date / time	27-May-2024 11:05	27-May-2024 11:35	27-May-2024 11:37	27-May-2024 12:06	27-May-2024 12:48
Compound	CAS Number	LOR	Unit		EP2407306-001	EP2407306-002	EP2407306-003	EP2407306-004	EP2407306-005
					Result	Result	Result	Result	Result
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		<0.1	**0.1**	**0.1**	**0.6**	**0.5**
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		<0.02	**0.31**	**0.31**	**0.56**	**0.60**
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		<0.02	**0.30**	**0.30**	**1.87**	**2.56**
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		<0.02	**0.14**	**0.14**	**0.18**	**0.25**
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		<0.01	**0.18**	**0.18**	**0.37**	**0.65**
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		<0.02	**0.03**	**0.04**	<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
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									

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW158_240527	0089_MW166_240527	0089_QC101_240527	0089_MW171_240527	0089_MW172_240527
				Sampling date / time	27-May-2024 11:05	27-May-2024 11:35	27-May-2024 11:37	27-May-2024 12:06	27-May-2024 12:48
Compound	CAS Number	LOR	Unit		EP2407306-001	EP2407306-002	EP2407306-003	EP2407306-004	EP2407306-005
					Result	Result	Result	Result	Result
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
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	**0.06**	**0.06**	<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	**8.92**	**9.47**	**14.5**	**27.4**
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		<0.01	**7.20**	**7.73**	**7.90**	**18.2**
Sum of PFAS (WA DER List)	----	0.01	µg/L		<0.01	**8.37**	**8.90**	**12.8**	**24.2**
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**94.5**	**96.7**	**96.9**	**98.1**	**92.2**
13C8-PFOA	----	0.02	%		**97.0**	**99.8**	**99.2**	**98.0**	**102**

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_QC104_240527	----	----	----	----
				Sampling date / time	27-May-2024 12:48	----	----	----	----
Compound	CAS Number	LOR	Unit		EP2407306-006	--------	--------	--------	--------
					Result	----	----	----	----
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		**1.15**	----	----	----	----
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		**0.74**	----	----	----	----
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		**7.77**	----	----	----	----
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		**1.90**	----	----	----	----
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		**9.83**	----	----	----	----
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		**0.4**	----	----	----	----
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		**0.46**	----	----	----	----
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		**1.96**	----	----	----	----
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		**0.20**	----	----	----	----
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		**0.53**	----	----	----	----
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: GROUNDWATER (Matrix: WATER)				Sample ID	0089_QC104_240527	----	----	----	----
				Sampling date / time	27-May-2024 12:48	----	----	----	----
Compound	CAS Number	LOR	Unit		EP2407306-006	--------	--------	--------	--------
					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		**24.9**	----	----	----	----
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		**17.6**	----	----	----	----
Sum of PFAS (WA DER List)	----	0.01	µg/L		**22.3**	----	----	----	----
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**87.9**	----	----	----	----
13C8-PFOA	----	0.02	%		**100**	----	----	----	----

Analytical Results

Sub-Matrix: RINSATE (Matrix: WATER)				Sample ID	0089_QC301_240527	0089_QC302_240527	0089_QC401_240527	0089_QC402_240527	----
				Sampling date / time	27-May-2024 14:58	27-May-2024 14:58	27-May-2024 14:59	27-May-2024 14:59	----
Compound	CAS Number	LOR	Unit		EP2407306-007	EP2407306-008	EP2407306-009	EP2407306-010	--------
					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		<0.01	<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	----
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		<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	----
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		<0.02	<0.02	<0.02	<0.02	----
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
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	----

Analytical Results

Sub-Matrix: RINSATE (Matrix: WATER)				Sample ID	0089_QC301_240527	0089_QC302_240527	0089_QC401_240527	0089_QC402_240527	----
				Sampling date / time	27-May-2024 14:58	27-May-2024 14:58	27-May-2024 14:59	27-May-2024 14:59	----
Compound	CAS Number	LOR	Unit		EP2407306-007	EP2407306-008	EP2407306-009	EP2407306-010	--------
					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	----
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		<0.01	<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	----
Sum of PFAS (WA DER List)	----	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	----
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**90.1**	**95.6**	**94.2**	**93.4**	----
13C8-PFOA	----	0.02	%		**107**	**101**	**105**	**107**	----

Surrogate Control Limits

Sub-Matrix: **GROUNDWATER**		Recovery Limits (%)	
Compound	*CAS Number*	**Low**	**High**
EP231S: PFAS Surrogate			
13C4-PFOS	----	65	140
13C8-PFOA	----	71	133

Sub-Matrix: **RINSATE**		Recovery Limits (%)	
Compound	*CAS Number*	**Low**	**High**
EP231S: PFAS Surrogate			
13C4-PFOS	----	65	140
13C8-PFOA	----	71	133

QUALITY CONTROL REPORT

Work Order	: **EP2407306**	Page	: 1 of 12
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: [redacted]
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: +61-8-9406 1301
Project	: WA_0089_PFASOMP_24	Date Samples Received	: 28-May-2024
Order number	: pfas-omp/Stirling	Date Analysis Commenced	: 30-May-2024
C-O-C number	: 68219	Issue Date	: 10-Jun-2024
Sampler	: [redacted]		
Site	: Stirling GW - MB		
Quote number	: SY/139/19 B		
No. of samples received	: 10		
No. of samples analysed	: 10		

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]	Laboratory Manager (Perth)	Perth Inorganics, Wangara, WA
[redacted]	Metals Chemist	Perth Inorganics, Wangara, WA
[redacted]	Senior Organic Chemist	Perth Organics, Wangara, WA

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 (%)
ED037P: Alkalinity by PC Titrator (QC Lot: 5828136)									
EP2407272-002	Anonymous	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	120	120	0.0	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	120	120	0.0	0% - 20%
EP2407273-007	Anonymous	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	359	358	0.0	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	359	358	0.0	0% - 20%
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QC Lot: 5827150)									
EP2407272-001	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	2610	2560	1.8	0% - 20%
EP2407384-003	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	36	36	0.0	0% - 20%
ED045G: Chloride by Discrete Analyser (QC Lot: 5827151)									
EP2407272-001	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	16900	15800	7.0	0% - 20%
EP2407384-003	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	106	107	0.0	0% - 20%
ED093F: Dissolved Major Cations (QC Lot: 5826269)									
EP2407272-001	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	425	410	3.7	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	1410	1360	3.7	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	11000	10600	4.0	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	643	620	3.7	0% - 20%
EP2407273-007	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	109	110	0.0	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	60	60	0.0	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	181	181	0.0	0% - 20%

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 (%)
ED093F: Dissolved Major Cations (QC Lot: 5826269) - continued									
EP2407273-007	Anonymous	ED093F: Potassium	7440-09-7	1	mg/L	13	13	0.0	0% - 50%
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 5834859)									
EP2407306-007	0089_QC301_240527	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
EP2407306-009	0089_QC401_240527	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: 5838188)									
EP2407306-002	0089_MW166_240527	EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	1.59	1.64	3.0	0% - 20%
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	5.61	6.72	18.0	0% - 20%
		EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	0.08	0.08	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	0.03	0.03	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	0.49	0.56	12.9	0% - 20%
		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: 5834859)									
EP2407306-007	0089_QC301_240527	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
EP2407306-009	0089_QC401_240527	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

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: 5834859) - continued									
EP2407306-009	0089_QC401_240527	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: 5838188)									
EP2407306-002	0089_MW166_240527	EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	0.18	0.18	5.7	0% - 50%
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	0.31	0.32	0.0	0% - 50%
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	0.30	0.30	0.0	0% - 50%
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	0.14	0.13	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	0.03	0.04	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: 5834859)									
EP2407306-007	0089_QC301_240527	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
EP2407306-009	0089_QC401_240527	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 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: 5834859) - continued									
EP2407306-009	0089_QC401_240527	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: 5838188)									
EP2407306-002	0089_MW166_240527	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: 5834859)									
EP2407306-007	0089_QC301_240527	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
EP2407306-009	0089_QC401_240527	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: 5838188)									

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: 5838188) - continued									
EP2407306-002	0089_MW166_240527	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	0.06	0.06	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: 5834859)									
EP2407306-007	0089_QC301_240527	EP231X: Sum of PFAS	----	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	<0.01	<0.01	0.0	No Limit
EP2407306-009	0089_QC401_240527	EP231X: Sum of PFAS	----	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	<0.01	<0.01	0.0	No Limit
EP231P: PFAS Sums (QC Lot: 5838188)									
EP2407306-002	0089_MW166_240527	EP231X: Sum of PFAS	----	0.01	µg/L	8.92	10.2	13.0	0% - 20%
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	7.20	8.36	14.9	0% - 20%
		EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	8.37	9.53	13.0	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
ED037P: Alkalinity by PC Titrator (QCLot: 5828136)								
ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	----	----	----	----
ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	----	----	----	----
ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	<1	----	----	----	----
ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	<1	20 mg/L	92.9	85.1	126
				<1	200 mg/L	97.6	90.5	111
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 5827150)								
ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<1	25 mg/L	109	89.9	112
				<1	500 mg/L	98.9	89.9	112
ED045G: Chloride by Discrete Analyser (QCLot: 5827151)								
ED045G: Chloride	16887-00-6	1	mg/L	<1	10 mg/L	103	88.6	113
				<1	1000 mg/L	96.0	88.6	113
ED093F: Dissolved Major Cations (QCLot: 5826269)								
ED093F: Calcium	7440-70-2	1	mg/L	<1	50 mg/L	96.2	86.5	117
ED093F: Magnesium	7439-95-4	1	mg/L	<1	50 mg/L	97.9	88.4	110
ED093F: Sodium	7440-23-5	1	mg/L	<1	50 mg/L	96.2	91.4	113
ED093F: Potassium	7440-09-7	1	mg/L	<1	50 mg/L	93.2	84.6	108
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5834859)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.2218 µg/L	100	72.0	130
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.2352 µg/L	81.0	71.0	127
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	0.2373 µg/L	84.3	68.0	131
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.238 µg/L	94.3	69.0	134
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.232 µg/L	92.0	65.0	140
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.241 µg/L	95.6	53.0	142
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5838188)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.2218 µg/L	97.4	72.0	130
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.2352 µg/L	83.5	71.0	127
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	0.2373 µg/L	93.6	68.0	131
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.238 µg/L	105	69.0	134
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.232 µg/L	97.6	65.0	140
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.241 µg/L	101	53.0	142

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: 5834859)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	1.25 µg/L	89.7	73.0	129
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	0.25 µg/L	94.4	72.0	129
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	0.25 µg/L	106	72.0	129
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	0.25 µg/L	98.0	72.0	130
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	0.25 µg/L	91.8	71.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	0.25 µg/L	95.4	69.0	130
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	0.25 µg/L	97.2	71.0	129
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	0.25 µg/L	90.8	69.0	133
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	0.25 µg/L	98.4	72.0	134
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	0.25 µg/L	108	65.0	144
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	0.25 µg/L	94.2	71.0	132
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5838188)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	1.25 µg/L	97.2	73.0	129
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	0.25 µg/L	104	72.0	129
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	0.25 µg/L	111	72.0	129
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	0.25 µg/L	101	72.0	130
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	0.25 µg/L	96.6	71.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	0.25 µg/L	96.4	69.0	130
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	0.25 µg/L	97.0	71.0	129
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	0.25 µg/L	105	69.0	133
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	0.25 µg/L	102	72.0	134
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	0.25 µg/L	95.2	65.0	144
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	0.25 µg/L	100	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5834859)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.25 µg/L	88.2	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	0.625 µg/L	92.0	68.0	141
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	0.625 µg/L	97.0	60.5	138
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	0.625 µg/L	85.2	68.3	134
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	0.625 µg/L	100	62.2	138
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	0.25 µg/L	90.6	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

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
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5838188)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.25 µg/L	96.6	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	0.625 µg/L	97.3	68.0	141
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	0.625 µg/L	102	60.5	138
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	0.625 µg/L	112	68.3	134
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	0.625 µg/L	93.6	62.2	138
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	0.25 µg/L	111	65.0	136
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	0.25 µg/L	99.4	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5834859)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.2343 µg/L	94.5	63.0	143
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	0.2378 µg/L	105	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	0.24 µg/L	96.2	67.0	138
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	0.241 µg/L	99.4	64.2	133
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5838188)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.2343 µg/L	111	63.0	143
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	0.2378 µg/L	105	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	0.24 µg/L	115	67.0	138
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	0.241 µg/L	98.5	64.2	133
EP231P: PFAS Sums (QCLot: 5834859)								
EP231X: Sum of PFAS	----	0.01	µg/L	<0.01	----	----	----	----
EP231X: Sum of PFHxS and PFOS	355-46-4/17 63-23-1	0.01	µg/L	<0.01	----	----	----	----
EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	<0.01	----	----	----	----
EP231P: PFAS Sums (QCLot: 5838188)								
EP231X: Sum of PFAS	----	0.01	µg/L	<0.01	----	----	----	----
EP231X: Sum of PFHxS and PFOS	355-46-4/17 63-23-1	0.01	µg/L	<0.01	----	----	----	----
EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	<0.01	----	----	----	----

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**

Matrix Spike (MS) Report

Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 5827150)							
EP2407272-001	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	100 mg/L	# Not Determined	70.4	130
ED045G: Chloride by Discrete Analyser (QCLot: 5827151)							
EP2407272-001	Anonymous	ED045G: Chloride	16887-00-6	200 mg/L	# Not Determined	70.0	130
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5834859)							
EP2407306-008	0089_QC302_240527	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.2218 µg/L	99.2	72.0	129
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.232 µg/L	83.0	71.0	127
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.2352 µg/L	88.8	68.0	129
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.238 µg/L	101	69.0	134
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.232 µg/L	88.8	65.0	140
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.241 µg/L	90.7	53.0	129
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5838188)							
EP2407316-013	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.2218 µg/L	92.2	72.0	129
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.232 µg/L	84.3	71.0	127
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.2352 µg/L	93.4	68.0	129
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.238 µg/L	95.4	69.0	134
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.232 µg/L	99.4	65.0	140
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.241 µg/L	76.6	53.0	129
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5834859)							
EP2407306-008	0089_QC302_240527	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	1.25 µg/L	84.3	73.0	142
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.25 µg/L	92.0	72.0	129
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.25 µg/L	111	72.0	129
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.25 µg/L	99.4	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	94.6	69.0	130
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.25 µg/L	98.2	71.0	134
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.25 µg/L	98.0	69.0	133
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.25 µg/L	102	72.0	134
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.25 µg/L	109	65.0	144
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.25 µg/L	107	71.0	132
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5838188)							
EP2407316-013	Anonymous	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	1.25 µg/L	111	73.0	142
		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	102	72.0	129
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.25 µg/L	91.9	72.0	130
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.25 µg/L	93.1	71.0	133
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.25 µg/L	93.0	69.0	130

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: 5838188) - continued							
EP2407316-013	Anonymous	EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.25 µg/L	93.6	71.0	134
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.25 µg/L	108	69.0	133
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.25 µg/L	96.6	72.0	134
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.25 µg/L	92.8	65.0	144
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.25 µg/L	100	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5834859)							
EP2407306-008	0089_QC302_240527	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.25 µg/L	94.6	59.0	135
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.625 µg/L	91.4	70.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.625 µg/L	103	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.625 µg/L	88.2	70.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.625 µg/L	93.0	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.25 µg/L	93.4	65.0	136
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.25 µg/L	107	61.0	135
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5838188)							
EP2407316-013	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.25 µg/L	97.6	59.0	135
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.625 µg/L	91.6	70.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.625 µg/L	92.6	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.625 µg/L	106	70.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.625 µg/L	102	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.25 µg/L	101	65.0	136
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.25 µg/L	92.4	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5834859)							
EP2407306-008	0089_QC302_240527	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.234 µg/L	98.5	63.0	143
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.2378 µg/L	104	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.24 µg/L	101	67.0	138
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.2415 µg/L	97.1	70.0	130
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5838188)							
EP2407316-013	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.234 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: 5838188) - continued							
EP2407316-013	Anonymous	EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.2378 µg/L	93.1	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.24 µg/L	109	67.0	138
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.2415 µg/L	74.5	70.0	130

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **EP2407306**	Page	: 1 of 6
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Telephone	: +61-8-9406 1301
Project	: WA_0089_PFASOMP_24	Date Samples Received	: 28-May-2024
Site	: Stirling GW - MB	Issue Date	: 10-Jun-2024
Sampler	: [redacted]	No. of samples received	: 10
Order number	: pfas-omp/Stirling	No. of samples analysed	: 10

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.**
- **Matrix Spike outliers exist - please see following pages for full details.**
- **For all regular sample matrices, where applicable to the methodology, 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 : Quality Control Samples

Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

Matrix: **WATER**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
Matrix Spike (MS) Recoveries							
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA	EP2407272--001	Anonymous	**Sulfate as SO4 - Turbidimetric**	14808-79-8	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
ED045G: Chloride by Discrete Analyser	EP2407272--001	Anonymous	**Chloride**	16887-00-6	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**

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	34	8.82	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*
ED037P: Alkalinity by PC Titrator							
Clear Plastic Bottle - Natural (ED037-P)							
0089_MW158_240527, 0089_MW166_240527, 0089_MW171_240527, 0089_MW172_240527	**27-May-2024**	**----**	----	----	**31-May-2024**	10-Jun-2024	✓
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA							
Clear Plastic Bottle - Natural (ED041G)							
0089_MW158_240527, 0089_MW166_240527, 0089_MW171_240527, 0089_MW172_240527	**27-May-2024**	**----**	----	----	**08-Jun-2024**	24-Jun-2024	✓
ED045G: Chloride by Discrete Analyser							
Clear Plastic Bottle - Natural (ED045G)							
0089_MW158_240527, 0089_MW166_240527, 0089_MW171_240527, 0089_MW172_240527	**27-May-2024**	**----**	----	----	**08-Jun-2024**	24-Jun-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
ED093F: Dissolved Major Cations								
Clear Plastic Bottle - Natural (ED093F)								
0089_MW158_240527,	0089_MW166_240527,	**27-May-2024**	**----**	----	**----**	**31-May-2024**	03-Jun-2024	✓
0089_MW171_240527,	0089_MW172_240527							
EP231A: Perfluoroalkyl Sulfonic Acids								
HDPE (no PTFE) (EP231X)								
0089_MW158_240527,	0089_QC301_240527,	**27-May-2024**	**04-Jun-2024**	23-Nov-2024	✓	**07-Jun-2024**	23-Nov-2024	✓
0089_QC302_240527,	0089_QC401_240527,							
0089_QC402_240527								
HDPE (no PTFE) (EP231X)								
0089_MW166_240527,	0089_QC101_240527,	**27-May-2024**	**06-Jun-2024**	23-Nov-2024	✓	**07-Jun-2024**	23-Nov-2024	✓
0089_MW171_240527,	0089_MW172_240527,							
0089_QC104_240527								
EP231B: Perfluoroalkyl Carboxylic Acids								
HDPE (no PTFE) (EP231X)								
0089_MW158_240527,	0089_QC301_240527,	**27-May-2024**	**04-Jun-2024**	23-Nov-2024	✓	**07-Jun-2024**	23-Nov-2024	✓
0089_QC302_240527,	0089_QC401_240527,							
0089_QC402_240527								
HDPE (no PTFE) (EP231X)								
0089_MW166_240527,	0089_QC101_240527,	**27-May-2024**	**06-Jun-2024**	23-Nov-2024	✓	**07-Jun-2024**	23-Nov-2024	✓
0089_MW171_240527,	0089_MW172_240527,							
0089_QC104_240527								
EP231C: Perfluoroalkyl Sulfonamides								
HDPE (no PTFE) (EP231X)								
0089_MW158_240527,	0089_QC301_240527,	**27-May-2024**	**04-Jun-2024**	23-Nov-2024	✓	**07-Jun-2024**	23-Nov-2024	✓
0089_QC302_240527,	0089_QC401_240527,							
0089_QC402_240527								
HDPE (no PTFE) (EP231X)								
0089_MW166_240527,	0089_QC101_240527,	**27-May-2024**	**06-Jun-2024**	23-Nov-2024	✓	**07-Jun-2024**	23-Nov-2024	✓
0089_MW171_240527,	0089_MW172_240527,							
0089_QC104_240527								
EP231D: (n:2) Fluorotelomer Sulfonic Acids								
HDPE (no PTFE) (EP231X)								
0089_MW158_240527,	0089_QC301_240527,	**27-May-2024**	**04-Jun-2024**	23-Nov-2024	✓	**07-Jun-2024**	23-Nov-2024	✓
0089_QC302_240527,	0089_QC401_240527,							
0089_QC402_240527								
HDPE (no PTFE) (EP231X)								
0089_MW166_240527,	0089_QC101_240527,	**27-May-2024**	**06-Jun-2024**	23-Nov-2024	✓	**07-Jun-2024**	23-Nov-2024	✓
0089_MW171_240527,	0089_MW172_240527,							
0089_QC104_240527								

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) 0089_MW158_240527, 0089_QC301_240527, 0089_QC302_240527, 0089_QC401_240527, 0089_QC402_240527	**27-May-2024**	**04-Jun-2024**	23-Nov-2024	✓	**07-Jun-2024**	23-Nov-2024	✓
HDPE (no PTFE) (EP231X) 0089_MW166_240527, 0089_QC101_240527, 0089_MW171_240527, 0089_MW172_240527, 0089_QC104_240527	**27-May-2024**	**06-Jun-2024**	23-Nov-2024	✓	**07-Jun-2024**	23-Nov-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)							
Alkalinity by Auto Titrator	ED037-P	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	3	34	**8.82**	**10.00**	×	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Alkalinity by Auto Titrator	ED037-P	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	34	**5.88**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Alkalinity by Auto Titrator	ED037-P	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	34	**5.88**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Chloride by Discrete Analyser	ED045G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	34	**5.88**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	20	**5.00**	**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
Alkalinity by Auto Titrator	ED037-P	WATER	In house: Referenced to APHA 2320 B This procedure determines alkalinity by automated measurement (e.g. PC Titrate) on a settled supernatant aliquot of the sample using pH 4.5 for indicating the total alkalinity end-point. This method is compliant with NEPM Schedule B(3)
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	WATER	In house: Referenced to APHA 4500-SO4. Dissolved sulfate is determined in a 0.45um filtered sample. Sulfate ions are converted to a barium sulfate suspension in an acetic acid medium with barium chloride. Light absorbance of the BaSO4 suspension is measured by a photometer and the SO4-2 concentration is determined by comparison of the reading with a standard curve. This method is compliant with NEPM Schedule B(3)
Chloride by Discrete Analyser	ED045G	WATER	In house: Referenced to APHA 4500 Cl - G.The thiocyanate ion is liberated from mercuric thiocyanate through sequestration of mercury by the chloride ion to form non-ionised mercuric chloride. In the presence of ferric ions the liberated thiocynate forms highly-coloured ferric thiocynate which is measured at 480 nm.
Major Cations - Dissolved	ED093F	WATER	In house: Referenced to APHA 3120 and 3125; USEPA SW 846 - 6010 and 6020; Cations are determined by either ICP-AES or ICP-MS techniques. This method is compliant with NEPM Schedule B(3) Sodium Adsorption Ratio is calculated from Ca, Mg and Na which determined by ALS in house method QWI-EN/ED093F. This method is compliant with NEPM Schedule B(3) Hardness parameters are calculated based on APHA 2340 B. This method is compliant with NEPM Schedule B(3)
Ionic Balance by PCT DA and Turbi SO4 DA	* EN055 - PG	WATER	In house: Referenced to APHA 1030F. This method is compliant with NEPM Schedule B(3)
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.

ALSCompass
SAMPLING *Intelligence*

ALS

Environmental Division
Perth
Work Order Reference
EP2407314

Telephone : +61-8-9406 1301

Custody Document for Submissions via ALS Compass App

Project: WA-0089-PFASOAP_24 Client: STANTEC Project Manager: [redacted]

ALS Compass COC Reference: 68293 68221 68274 68275 68271 68276 # Samples: 68266 68272 68267 Sampler: [redacted] Phone: ( )

Turnaround Requirements: Standard ____ Urgent ____

Special Instructions:

Custody:

Relinquished by: STANTEC	Received by: [redacted]	Relinquished by:	Received by:
Date / Time: 24/5/24 4 pm	Date / Time: 24/5 1230	Date / Time:	Date / Time:

CHAIN OF CUSTODY

ALS COC#: 68221 ALS Laboratory: EP Perth Environmental

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

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP_24

SITE: Stirling SD - MB

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]derp.labreports@esdat.com.au

EMAIL INVOICES 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 Sediments SEDIMENT	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
001	0089_SD307		28/05/2024 10:40 AM	SOIL	ALS: 1 Non ALS: 0	No	X		
002	0089_SD308		28/05/2024 10:40 AM	SOIL	ALS: 1 Non ALS: 0	No	X		
003	0089_QC110		28/05/2024 10:41 AM	SOIL	ALS: 1 Non ALS: 0	No	X		
004	0089_SD315		28/05/2024 10:41 AM	SOIL	ALS: 1 Non ALS: 0	No	X		
005	0089_SD306		28/05/2024 10:41 AM	SOIL	ALS: 1 Non ALS: 0	No	X		
006	0089_SD314		28/05/2024 10:42 AM	SOIL	ALS: 1 Non ALS: 0	No	X		
007	0089_SD411		28/05/2024 12:22 PM	SOIL	ALS: 1 Non ALS: 0	No	X		

CHAIN OF CUSTODY

COC#: 68221 *ALS Laboratory:* EP Perth Environmental

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP_24

SITE: Stirling SD - MB

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER:

CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted] derp.labreports@esdat.com.au

EMAIL INVOICES TO: [redacted]

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

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 Sediments SEDIMENT	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
008	0089_QC117		28/05/2024 12:23 PM	SOIL	ALS: 1 Non ALS: 0	No	X		
009	0089_SD413		28/05/2024 12:23 PM	SOIL	ALS: 1 Non ALS: 0	No	X		
010	0089_QC118		28/05/2024 12:24 PM	SOIL	ALS: 1 Non ALS: 0	No	X		
011	0089_QC415		28/05/2024 12:24 PM	SOIL	ALS: 1 Non ALS: 0	No	X		

CHAIN OF CUSTODY

COC#: 68221 *ALS Laboratory:* EP Perth Environmental

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP_24

SITE: Stirling SD - MB

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER:

CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted] derp.labreports@esdat.com.au

EMAIL INVOICES TO:

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

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	0089_SD307	HDPE Soil Jar	200 mL	00621122049159	Grey	No	
002	0089_SD308	HDPE Soil Jar	200 mL	00621122049062	Grey	No	
003	0089_QC110	HDPE Soil Jar	200 mL	00621122049143	Grey	No	
004	0089_SD315	HDPE Soil Jar	200 mL	00621122049146	Grey	No	
005	0089_SD306	HDPE Soil Jar	200 mL	00621122049172	Grey	No	
006	0089_SD314	HDPE Soil Jar	200 mL	00621122049074	Grey	No	
007	0089_SD411	HDPE Soil Jar	200 mL	00621122049098	Grey	No	
008	0089_QC117	HDPE Soil Jar	200 mL	00621122049185	Grey	No	
009	0089_SD413	HDPE Soil Jar	200 mL	00621122049037	Grey	No	
010	0089_QC118	HDPE Soil Jar	200 mL	00621122049170	Grey	No	
011	0089_QC415	HDPE Soil Jar	200 mL	00621122049049	Grey	No	

Total Bottle Count: ALS: 11, Non ALS: 0

SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : **EP2407314**

Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: [redacted]
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
E-mail	: [redacted]stantec.com	E-mail	: [redacted]alsglobal.com
Telephone	: ----	Telephone	: +61-8-9406 1301
Facsimile	: ----	Facsimile	: +61-8-9406 1399
Project	: WA_0089_PFASOMP_24	Page	: 1 of 2
Order number	: pfas-omp/Stirling	Quote number	: ES2022MWHAUS0002 (SY/139/19 B)
C-O-C number	: 68221	QC Level	: NEPM 2013 B3 & ALS QC Standard
Site	: Stirling SD - MB		
Sampler	: [redacted]		

Dates

Date Samples Received	: 29-May-2024 12:30	Issue Date	: 30-May-2024
Client Requested Due Date	: 10-Jun-2024	Scheduled Reporting Date	: **10-Jun-2024**

Delivery Details

Mode of Delivery	: Carrier	Security Seal	: Not Available
No. of coolers/boxes	: 2	Temperature	: 14.1 - Ice present
Receipt Detail	:	No. of samples received / analysed	: 11 / 11

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 see scanned COC for sample discrepencies: extra samples , samples not received etc.
- Please direct any queries related to sample condition / numbering / breakages to Sample Receipt (Samples.Perth@alsglobal.com)
- Analytical work for this work order will be conducted at ALS Environmental Perth.
- Please direct any turnaround / technical queries to the laboratory contact designated above.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months) from receipt of samples.
- **pH analysis should be conducted within 6 hours of sampling.**
- **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.**
- 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: **SOIL**

Laboratory sample ID	Sampling date / time	Sample ID	SOIL - EA055-103 Moisture Content	SOIL - EP231X (solids) PFAS - Full Suite (30 analytes)
EP2407314-001	28-May-2024 10:40	0089_SD307_240528	✓	✓
EP2407314-002	28-May-2024 10:40	0089_SD308_240528	✓	✓
EP2407314-003	28-May-2024 10:41	0089_QC110_240528	✓	✓
EP2407314-004	28-May-2024 10:41	0089_SD315_240528	✓	✓
EP2407314-005	28-May-2024 10:41	0089_SD306_240528	✓	✓
EP2407314-006	28-May-2024 10:42	0089_SD314_240528	✓	✓
EP2407314-007	28-May-2024 12:22	0089_SD411_240528	✓	✓
EP2407314-008	28-May-2024 12:23	0089_QC117_240528	✓	✓
EP2407314-009	28-May-2024 12:23	0089_SD413_240528	✓	✓
EP2407314-010	28-May-2024 12:24	0089_QC118_240528	✓	✓
EP2407314-011	28-May-2024 12:24	0089_QC415_240528	✓	✓

Proactive Holding Time Report

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

Requested Deliverables

[redacted]
- A4 - AU Tax Invoice (INV) — Email — [redacted]cardno.com.au

DERP LAB REPORTS
- EDI Format - ESDAT (ESDAT) — Email — derp.labreports@esdat.com.au

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

CERTIFICATE OF ANALYSIS

Work Order	: **EP2407314**	Page	: 1 of 9
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: [redacted]
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: +61-8-9406 1301
Project	: WA_0089_PFASOMP_24	Date Samples Received	: 29-May-2024 12:30
Order number	: pfas-omp/Stirling	Date Analysis Commenced	: 05-Jun-2024
C-O-C number	: 68221	Issue Date	: 10-Jun-2024 12:59
Sampler	: [redacted]		
Site	: Stirling SD - MB		
Quote number	: SY/139/19 B		
No. of samples received	: 11		
No. of samples analysed	: 11		

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]	Laboratory Manager (Perth)	Perth Inorganics, Wangara, WA
[redacted]	Senior Organic Chemist	Perth Organics, Wangara, WA

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.

- 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 USEPA 1633 limits 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: SEDIMENT (Matrix: SOIL)				Sample ID	0089_SD307_240528	0089_SD308_240528	0089_QC110_240528	0089_SD315_240528	0089_SD306_240528
				Sampling date / time	28-May-2024 10:40	28-May-2024 10:40	28-May-2024 10:41	28-May-2024 10:41	28-May-2024 10:41
Compound	CAS Number	LOR	Unit		EP2407314-001	EP2407314-002	EP2407314-003	EP2407314-004	EP2407314-005
					Result	Result	Result	Result	Result
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content	----	0.1	%		**9.0**	**12.8**	**12.7**	**10.4**	**15.5**
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg		<0.001	<0.001	<0.001	<0.001	<0.001
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002

Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)				Sample ID	0089_SD307_240528	0089_SD308_240528	0089_QC110_240528	0089_SD315_240528	0089_SD306_240528
				Sampling date / time	28-May-2024 10:40	28-May-2024 10:40	28-May-2024 10:41	28-May-2024 10:41	28-May-2024 10:41
Compound	CAS Number	LOR	Unit		EP2407314-001	EP2407314-002	EP2407314-003	EP2407314-004	EP2407314-005
					Result	Result	Result	Result	Result
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
EP231P: PFAS Sums									
Sum of PFAS	----	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Sum of PFAS (WA DER List)	----	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.0002	%		**95.5**	**112**	**95.5**	**97.0**	**94.5**
13C8-PFOA	----	0.0002	%		**114**	**108**	**105**	**111**	**108**

Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)				Sample ID	0089_SD314_240528	0089_SD411_240528	0089_QC117_240528	0089_SD413_240528	0089_QC118_240528
				Sampling date / time	28-May-2024 10:42	28-May-2024 12:22	28-May-2024 12:23	28-May-2024 12:23	28-May-2024 12:24
Compound	CAS Number	LOR	Unit		EP2407314-006	EP2407314-007	EP2407314-008	EP2407314-009	EP2407314-010
					Result	Result	Result	Result	Result
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content	----	0.1	%		**16.2**	**16.4**	**15.1**	**17.1**	**16.9**
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg		<0.001	<0.001	<0.001	<0.001	<0.001
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002

Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)			Sample ID	0089_SD314_240528	0089_SD411_240528	0089_QC117_240528	0089_SD413_240528	0089_QC118_240528
			Sampling date / time	28-May-2024 10:42	28-May-2024 12:22	28-May-2024 12:23	28-May-2024 12:23	28-May-2024 12:24
Compound	CAS Number	LOR	Unit	EP2407314-006	EP2407314-007	EP2407314-008	EP2407314-009	EP2407314-010
				Result	Result	Result	Result	Result
EP231C: Perfluoroalkyl Sulfonamides - Continued								
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
EP231D: (n:2) Fluorotelomer Sulfonic Acids								
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
EP231P: PFAS Sums								
Sum of PFAS	----	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Sum of PFAS (WA DER List)	----	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
EP231S: PFAS Surrogate								
13C4-PFOS	----	0.0002	%	**102**	**98.0**	**98.5**	**96.0**	**102**
13C8-PFOA	----	0.0002	%	**108**	**108**	**104**	**113**	**112**

Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)				Sample ID	0089_QC415_240528	----	----	----	----
				Sampling date / time	28-May-2024 12:24	----	----	----	----
Compound	CAS Number	LOR	Unit		EP2407314-011	--------	--------	--------	--------
					Result	----	----	----	----
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content	----	0.1	%		**16.0**	----	----	----	----
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg		<0.0002	----	----	----	----
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg		<0.0002	----	----	----	----
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg		<0.0002	----	----	----	----
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg		<0.0002	----	----	----	----
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg		<0.0002	----	----	----	----
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg		<0.0002	----	----	----	----
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg		<0.001	----	----	----	----
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg		<0.0002	----	----	----	----
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg		<0.0002	----	----	----	----
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg		<0.0002	----	----	----	----
Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg		<0.0002	----	----	----	----
Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg		<0.0002	----	----	----	----
Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg		<0.0002	----	----	----	----
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg		<0.0002	----	----	----	----
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg		<0.0002	----	----	----	----
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg		<0.0002	----	----	----	----
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg		<0.0005	----	----	----	----
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg		<0.0002	----	----	----	----

Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)				Sample ID	0089_QC415_240528	----	----	----	----
				Sampling date / time	28-May-2024 12:24	----	----	----	----
Compound	CAS Number	LOR	Unit		EP2407314-011	--------	--------	--------	--------
					Result	----	----	----	----
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg		<0.0005	----	----	----	----
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg		<0.0005	----	----	----	----
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg		<0.0005	----	----	----	----
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg		<0.0005	----	----	----	----
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg		<0.0002	----	----	----	----
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg		<0.0002	----	----	----	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg		<0.0005	----	----	----	----
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg		<0.0005	----	----	----	----
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg		<0.0005	----	----	----	----
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg		<0.0005	----	----	----	----
EP231P: PFAS Sums									
Sum of PFAS	----	0.0002	mg/kg		<0.0002	----	----	----	----
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg		<0.0002	----	----	----	----
Sum of PFAS (WA DER List)	----	0.0002	mg/kg		<0.0002	----	----	----	----
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.0002	%		**102**	----	----	----	----
13C8-PFOA	----	0.0002	%		**111**	----	----	----	----

Surrogate Control Limits

Sub-Matrix: **SEDIMENT**		Recovery Limits (%)	
Compound	*CAS Number*	*Low*	*High*
EP231S: PFAS Surrogate			
13C4-PFOS	----	76	136
13C8-PFOA	----	78	131

QUALITY CONTROL REPORT

Work Order	: **EP2407314**	Page	: 1 of 7
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: [redacted]
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: +61-8-9406 1301
Project	: WA_0089_PFASOMP_24	Date Samples Received	: 29-May-2024
Order number	: pfas-omp/Stirling	Date Analysis Commenced	: 05-Jun-2024
C-O-C number	: 68221	Issue Date	: 10-Jun-2024
Sampler	: [redacted]		
Site	: Stirling SD - MB		
Quote number	: SY/139/19 B		
No. of samples received	: 11		
No. of samples analysed	: 11		

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]	Laboratory Manager (Perth)	Perth Inorganics, Wangara, WA
[redacted]	Senior Organic Chemist	Perth Organics, Wangara, WA

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: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
EA055: Moisture Content (Dried @ 105-110°C) (QC Lot: 5836314)									
EP2407274-001	Anonymous	EA055: Moisture Content	----	0.1	%	23.1	21.7	6.1	0% - 20%
EP2407314-005	0089_SD306_240528	EA055: Moisture Content	----	0.1	%	15.5	17.0	9.2	0% - 20%
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 5834296)									
EP2407274-001	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
EP2407314-005	0089_SD306_240528	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 5834296)									
EP2407274-001	Anonymous	EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit

Sub-Matrix: **SOIL**

				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: 5834296) - continued									
EP2407274-001	Anonymous	EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	<0.001	0.0	No Limit
EP2407314-005	0089_SD306_240528	EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	<0.001	0.0	No Limit
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 5834296)									
EP2407274-001	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
EP2407314-005	0089_SD306_240528	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit

Sub-Matrix: **SOIL**

				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: 5834296) - continued									
EP2407314-005	0089_SD306_240528	EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 5834296)									
EP2407274-001	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
EP2407314-005	0089_SD306_240528	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
EP231P: PFAS Sums (QC Lot: 5834296)									
EP2407274-001	Anonymous	EP231X: Sum of PFAS	----	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Sum of PFAS (WA DER List)	----	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
EP2407314-005	0089_SD306_240528	EP231X: Sum of PFAS	----	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Sum of PFAS (WA DER List)	----	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit

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: **SOIL**

				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: 5834296)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	0.0011 mg/kg	94.5	72.0	128
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	0.00125 mg/kg	78.8	73.0	123
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	0.00118 mg/kg	89.0	67.0	130
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	0.00119 mg/kg	96.2	70.0	132
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	0.00116 mg/kg	87.9	68.0	136
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	0.0012 mg/kg	95.0	59.0	134
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5834296)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	0.00625 mg/kg	96.2	71.0	135
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	0.00125 mg/kg	95.2	69.0	132
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	0.00125 mg/kg	104	70.0	132
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	0.00125 mg/kg	94.4	71.0	131
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	99.6	69.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	102	72.0	129
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	0.00125 mg/kg	98.4	69.0	133
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	100	64.0	136
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	96.4	69.0	135
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	102	66.0	139
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	0.00125 mg/kg	102	69.0	133
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5834296)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	0.00125 mg/kg	97.2	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	0.00312 mg/kg	92.0	59.6	143
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	0.00312 mg/kg	102	62.8	140
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	0.00312 mg/kg	92.5	61.5	139
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	0.00312 mg/kg	89.9	61.9	139
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	0.00125 mg/kg	89.6	63.0	144
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	0.00125 mg/kg	109	61.0	139
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5834296)								

Sub-Matrix: **SOIL**

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: 5834296) - continued								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	0.00117 mg/kg	105	62.0	145
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	0.00118 mg/kg	101	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	0.0012 mg/kg	104	65.0	137
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	0.0012 mg/kg	104	54.8	124
EP231P: PFAS Sums (QCLot: 5834296)								
EP231X: Sum of PFAS	----	0.0002	mg/kg	<0.0002	----	----	----	----
EP231X: Sum of PFHxS and PFOS	355-46-4/17 63-23-1	0.0002	mg/kg	<0.0002	----	----	----	----
EP231X: Sum of PFAS (WA DER List)	----	0.0002	mg/kg	<0.0002	----	----	----	----

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: **SOIL**

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: 5834296)							
EP2407274-002	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0011 mg/kg	89.5	72.0	128
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.00117 mg/kg	78.6	73.0	123
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.00118 mg/kg	84.2	67.0	130
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.00119 mg/kg	95.4	70.0	132
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.00116 mg/kg	86.5	68.0	136
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0012 mg/kg	98.4	59.0	134
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5834296)							
EP2407274-002	Anonymous	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.00625 mg/kg	87.1	71.0	135
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.00125 mg/kg	94.4	69.0	132
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.00125 mg/kg	109	70.0	132
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.00125 mg/kg	91.6	71.0	131
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.00125 mg/kg	106	69.0	133
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.00125 mg/kg	93.5	72.0	129
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.00125 mg/kg	100	69.0	133
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.00125 mg/kg	98.8	64.0	136
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.00125 mg/kg	98.4	69.0	135
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.00125 mg/kg	108	66.0	139
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.00125 mg/kg	104	69.0	133
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5834296)							

Sub-Matrix: **SOIL**

				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: 5834296) - continued							
EP2407274-002	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.00125 mg/kg	91.9	48.0	128
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.00312 mg/kg	93.8	60.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.00312 mg/kg	90.9	60.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.00312 mg/kg	115	60.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.00312 mg/kg	90.1	60.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.00125 mg/kg	92.8	63.0	144
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.00125 mg/kg	105	61.0	139
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5834296)							
EP2407274-002	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.00117 mg/kg	97.9	62.0	145
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.00118 mg/kg	100	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0012 mg/kg	98.8	65.0	137
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0012 mg/kg	94.6	60.0	130

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **EP2407314**	Page	: 1 of 5
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Telephone	: +61-8-9406 1301
Project	: WA_0089_PFASOMP_24	Date Samples Received	: 29-May-2024
Site	: Stirling SD - MB	Issue Date	: 10-Jun-2024
Sampler	: [redacted]	No. of samples received	: 11
Order number	: pfas-omp/Stirling	No. of samples analysed	: 11

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, where applicable to the methodology, 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: **SOIL**

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
EA055: Moisture Content (Dried @ 105-110°C)							
HDPE Soil Jar (EA055)							
0089_SD307_240528, 0089_SD308_240528, 0089_QC110_240528, 0089_SD315_240528, 0089_SD306_240528, 0089_SD314_240528, 0089_SD411_240528, 0089_QC117_240528, 0089_SD413_240528, 0089_QC118_240528, 0089_QC415_240528	**28-May-2024**	**----**	----	----	**05-Jun-2024**	11-Jun-2024	✓
EP231A: Perfluoroalkyl Sulfonic Acids							
HDPE Soil Jar (EP231X)							
0089_SD307_240528, 0089_SD308_240528, 0089_QC110_240528, 0089_SD315_240528, 0089_SD306_240528, 0089_SD314_240528, 0089_SD411_240528, 0089_QC117_240528, 0089_SD413_240528, 0089_QC118_240528, 0089_QC415_240528	**28-May-2024**	**06-Jun-2024**	24-Nov-2024	✓	**07-Jun-2024**	16-Jul-2024	✓
EP231B: Perfluoroalkyl Carboxylic Acids							
HDPE Soil Jar (EP231X)							
0089_SD307_240528, 0089_SD308_240528, 0089_QC110_240528, 0089_SD315_240528, 0089_SD306_240528, 0089_SD314_240528, 0089_SD411_240528, 0089_QC117_240528, 0089_SD413_240528, 0089_QC118_240528, 0089_QC415_240528	**28-May-2024**	**06-Jun-2024**	24-Nov-2024	✓	**07-Jun-2024**	16-Jul-2024	✓
EP231C: Perfluoroalkyl Sulfonamides							
HDPE Soil Jar (EP231X)							
0089_SD307_240528, 0089_SD308_240528, 0089_QC110_240528, 0089_SD315_240528, 0089_SD306_240528, 0089_SD314_240528, 0089_SD411_240528, 0089_QC117_240528, 0089_SD413_240528, 0089_QC118_240528, 0089_QC415_240528	**28-May-2024**	**06-Jun-2024**	24-Nov-2024	✓	**07-Jun-2024**	16-Jul-2024	✓

Matrix: **SOIL**

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 Soil Jar (EP231X)							
0089_SD307_240528, 0089_SD308_240528, 0089_QC110_240528, 0089_SD315_240528, 0089_SD306_240528, 0089_SD314_240528, 0089_SD411_240528, 0089_QC117_240528, 0089_SD413_240528, 0089_QC118_240528, 0089_QC415_240528	**28-May-2024**	**06-Jun-2024**	24-Nov-2024	✓	**07-Jun-2024**	16-Jul-2024	✓
EP231P: PFAS Sums							
HDPE Soil Jar (EP231X)							
0089_SD307_240528, 0089_SD308_240528, 0089_QC110_240528, 0089_SD315_240528, 0089_SD306_240528, 0089_SD314_240528, 0089_SD411_240528, 0089_QC117_240528, 0089_SD413_240528, 0089_QC118_240528, 0089_QC415_240528	**28-May-2024**	**06-Jun-2024**	24-Nov-2024	✓	**07-Jun-2024**	16-Jul-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: **SOIL**

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)							
Moisture Content	EA055	2	18	**11.11**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	20	**5.00**	**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
Moisture Content	EA055	SOIL	In house: A gravimetric procedure based on weight loss over a 12 hour drying period at 105-110 degrees C. This method is compliant with NEPM Schedule B(3).
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	SOIL	In-house: Analysis of soils by solvent extraction followed by LC-Electrospray-MS-MS, Negative Mode using MRM using internal standard quantitation. Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to a portion of soil which is then extracted with MTBE and an ion pairing reagent. A portion of extract is exchanged into the analytical solvent mixture, combined with an equal volume reagent water and 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
QuECheRS Extraction of Solids	* ORG71	SOIL	In house: Sequential extractions with Acetonitrile/Methanol by shaking. Extraction efficiency aided by the addition of salts under acidic conditions. Where relevant, interferences from co-extracted organics are removed with dispersive clean-up media (dSPE). The extract is either diluted or concentrated and exchanged into the analytical solvent.

SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : **EP2407316**

Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: [redacted]
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
E-mail	: [redacted]stantec.com	E-mail	: [redacted]alsglobal.com
Telephone	: ----	Telephone	: +61-8-9406 1301
Facsimile	: ----	Facsimile	: +61-8-9406 1399
Project	: WA_0089_PFASOMP_24	Page	: 1 of 2
Order number	: pfas-omp/Stirling	Quote number	: ES2022MWHAUS0002 (SY/139/19 B)
C-O-C number	: 68293	QC Level	: NEPM 2013 B3 & ALS QC Standard
Site	: Stirling SW/PW - MB		
Sampler	: [redacted]		

Dates

Date Samples Received	: 29-May-2024 12:30	Issue Date	: 30-May-2024
Client Requested Due Date	: 10-Jun-2024	Scheduled Reporting Date	: **10-Jun-2024**

Delivery Details

Mode of Delivery	: Carrier	Security Seal	: Not Available
No. of coolers/boxes	: 2	Temperature	: 14.1 - Ice present
Receipt Detail	:	No. of samples received / analysed	: 16 / 16

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 see scanned COC for sample discrepencies: extra samples , samples not received etc.
- Please direct any queries related to sample condition / numbering / breakages to Sample Receipt (Samples.Perth@alsglobal.com)
- Analytical work for this work order will be conducted at ALS Environmental Perth.
- Please direct any turnaround / technical queries to the laboratory contact designated above.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months) from receipt of samples.
- **pH analysis should be conducted within 6 hours of sampling.**
- **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.**
- 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 (30 analytes)	WATER - NT-01 & 02 Ca, Mg, Na, K, Cl, SO4, Alkalinity
EP2407316-001	28-May-2024 10:43	0089_PW308_240528	✓	✓
EP2407316-002	28-May-2024 10:45	0089_PW315_240528	✓	✓
EP2407316-003	28-May-2024 10:46	0089_QC111_240528	✓	
EP2407316-004	28-May-2024 10:46	0089_PW307_240528	✓	✓
EP2407316-005	28-May-2024 10:47	0089_SW310_240528	✓	✓
EP2407316-006	28-May-2024 10:48	0089_SW311_240528	✓	✓
EP2407316-007	28-May-2024 10:49	0089_SW309_240528	✓	✓
EP2407316-008	28-May-2024 10:50	0089_PW306_240528	✓	✓
EP2407316-009	28-May-2024 10:51	0089_PW314_240528	✓	✓
EP2407316-010	28-May-2024 12:25	0089_SW412_240528	✓	✓
EP2407316-011	28-May-2024 12:26	0089_PW415_240528	✓	✓
EP2407316-012	28-May-2024 12:27	0089_SW416_240528	✓	✓
EP2407316-013	28-May-2024 12:28	0089_PW413_240528	✓	✓
EP2407316-014	28-May-2024 12:29	0089_SW414_240528	✓	✓
EP2407316-015	28-May-2024 12:30	0089_PW411_240528	✓	✓
EP2407316-016	28-May-2024 12:31	0089_QC116_240528	✓	

Proactive Holding Time Report

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

Requested Deliverables

[redacted]
- A4 - AU Tax Invoice (INV) — Email — [redacted]cardno.com.au

DERP LAB REPORTS
- EDI Format - ESDAT (ESDAT) — Email — derp.labreports@esdat.com.au

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

CERTIFICATE OF ANALYSIS

Work Order	: **EP2407316**	Page	: 1 of 14
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: [redacted]
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: +61-8-9406 1301
Project	: WA_0089_PFASOMP_24	Date Samples Received	: 29-May-2024 12:30
Order number	: pfas-omp/Stirling	Date Analysis Commenced	: 31-May-2024
C-O-C number	: 68293	Issue Date	: 10-Jun-2024 13:00
Sampler	: [redacted]		
Site	: Stirling SW/PW - MB		
Quote number	: SY/139/19 B		
No. of samples received	: 16		
No. of samples analysed	: 16		

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]	Inorganics Supervisor	Perth Inorganics, Wangara, WA
[redacted]	Laboratory Manager (Perth)	Perth Inorganics, Wangara, WA
[redacted]	Senior Organic Chemist	Perth Organics, Wangara, WA

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.
- As per QWI – EN55-3 Data Interpreting Procedures, Ionic balances are typically calculated using Major Anions - Chloride, Alkalinity and Sulfate; and Major Cations - Calcium, Magnesium, Potassium and Sodium. Where applicable and dependent upon sample matrix, the Ionic Balance may also include the additional contribution of Ammonia, Dissolved Metals by ICPMS and H+ to the Cations and Nitrate, SiO2 and Fluoride to the Anions.
- Sodium Adsorption Ratio (where reported): Where results for Na, Ca or Mg are <LOR, a concentration at half the reported LOR is incorporated into the SAR calculation. This represents a conservative approach for Na relative to the assumption that <LOR = zero concentration and a conservative approach for Ca & Mg relative to the assumption that <LOR is equivalent to the LOR concentration.
- 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.
- ED045G: The presence of Thiocyanate, Thiosulfate and Sulfite can positively contribute to the chloride result, thereby may bias results higher than expected. Results should be scrutinised accordingly.

Analytical Results

Sub-Matrix: MARINE WATER (Matrix: WATER)				Sample ID	0089_PW415_240528	0089_SW416_240528	0089_PW413_240528	0089_SW414_240528	0089_PW411_240528
				Sampling date / time	28-May-2024 12:26	28-May-2024 12:27	28-May-2024 12:28	28-May-2024 12:29	28-May-2024 12:30
Compound	CAS Number	LOR	Unit		EP2407316-011	EP2407316-012	EP2407316-013	EP2407316-014	EP2407316-015
					Result	Result	Result	Result	Result
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	<1	<1	<1	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	<1	<1	<1	<1
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		160	128	166	132	220
Total Alkalinity as CaCO3	----	1	mg/L		160	128	166	132	220
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		2360	2310	2300	2410	2180
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		17200	17200	16700	17900	16600
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		418	442	422	437	455
Magnesium	7439-95-4	1	mg/L		1300	1390	1320	1380	1310
Sodium	7440-23-5	1	mg/L		9960	10500	10100	10500	9870
Potassium	7440-09-7	1	mg/L		555	593	564	589	570
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		538	536	522	558	518
ø Total Cations	----	0.01	meq/L		575	608	583	607	574
ø Ionic Balance	----	0.01	%		3.39	6.34	5.53	4.24	5.16
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

Analytical Results

Sub-Matrix: MARINE WATER (Matrix: WATER)				Sample ID	0089_PW415_240528	0089_SW416_240528	0089_PW413_240528	0089_SW414_240528	0089_PW411_240528
				Sampling date / time	28-May-2024 12:26	28-May-2024 12:27	28-May-2024 12:28	28-May-2024 12:29	28-May-2024 12:30
Compound	CAS Number	LOR	Unit		EP2407316-011	EP2407316-012	EP2407316-013	EP2407316-014	EP2407316-015
					Result	Result	Result	Result	Result
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
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									

Analytical Results

Sub-Matrix: MARINE WATER (Matrix: WATER)				Sample ID	0089_PW415_240528	0089_SW416_240528	0089_PW413_240528	0089_SW414_240528	0089_PW411_240528
				Sampling date / time	28-May-2024 12:26	28-May-2024 12:27	28-May-2024 12:28	28-May-2024 12:29	28-May-2024 12:30
Compound	CAS Number	LOR	Unit		EP2407316-011	EP2407316-012	EP2407316-013	EP2407316-014	EP2407316-015
					Result	Result	Result	Result	Result
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
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	%		**98.7**	**109**	**98.6**	**106**	**94.6**
13C8-PFOA	----	0.02	%		**95.9**	**87.7**	**100**	**99.7**	**97.5**

Analytical Results

Sub-Matrix: MARINE WATER (Matrix: WATER)				Sample ID	0089_QC116_240528	----	----	----	----
				Sampling date / time	28-May-2024 12:31	----	----	----	----
Compound	CAS Number	LOR	Unit		EP2407316-016	--------	--------	--------	--------
					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: MARINE WATER (Matrix: WATER)				Sample ID	0089_QC116_240528	----	----	----	----
				Sampling date / time	28-May-2024 12:31	----	----	----	----
Compound	CAS Number	LOR	Unit		EP2407316-016	--------	--------	--------	--------
					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	%		**101**	----	----	----	----
13C8-PFOA	----	0.02	%		**105**	----	----	----	----

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_PW308_240528	0089_PW315_240528	0089_QC111_240528	0089_PW307_240528	0089_SW310_240528
				Sampling date / time	28-May-2024 10:43	28-May-2024 10:45	28-May-2024 10:46	28-May-2024 10:46	28-May-2024 10:47
Compound	CAS Number	LOR	Unit		EP2407316-001	EP2407316-002	EP2407316-003	EP2407316-004	EP2407316-005
					Result	Result	Result	Result	Result
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	<1	----	<1	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	<1	----	<1	<1
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		146	124	----	298	124
Total Alkalinity as CaCO3	----	1	mg/L		146	124	----	298	124
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		2290	2410	----	2320	2300
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		17300	18300	----	17300	17400
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		441	438	----	488	436
Magnesium	7439-95-4	1	mg/L		1370	1380	----	1390	1390
Sodium	7440-23-5	1	mg/L		10400	10500	----	10500	10600
Potassium	7440-09-7	1	mg/L		581	589	----	608	591
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		539	569	----	542	541
ø Total Cations	----	0.01	meq/L		602	607	----	611	612
ø Ionic Balance	----	0.01	%		5.56	3.26	----	5.96	6.17
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

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_PW308_240528	0089_PW315_240528	0089_QC111_240528	0089_PW307_240528	0089_SW310_240528
				Sampling date / time	28-May-2024 10:43	28-May-2024 10:45	28-May-2024 10:46	28-May-2024 10:46	28-May-2024 10:47
Compound	CAS Number	LOR	Unit		EP2407316-001	EP2407316-002	EP2407316-003	EP2407316-004	EP2407316-005
					Result	Result	Result	Result	Result
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
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									

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_PW308_240528	0089_PW315_240528	0089_QC111_240528	0089_PW307_240528	0089_SW310_240528
				Sampling date / time	28-May-2024 10:43	28-May-2024 10:45	28-May-2024 10:46	28-May-2024 10:46	28-May-2024 10:47
Compound	CAS Number	LOR	Unit		EP2407316-001	EP2407316-002	EP2407316-003	EP2407316-004	EP2407316-005
					Result	Result	Result	Result	Result
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
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	%		**105**	**103**	**96.1**	**110**	**108**
13C8-PFOA	----	0.02	%		**94.3**	**96.3**	**90.3**	**98.8**	**88.9**

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_SW311_240528	0089_SW309_240528	0089_PW306_240528	0089_PW314_240528	0089_SW412_240528
				Sampling date / time	28-May-2024 10:48	28-May-2024 10:49	28-May-2024 10:50	28-May-2024 10:51	28-May-2024 12:25
Compound	CAS Number	LOR	Unit		EP2407316-006	EP2407316-007	EP2407316-008	EP2407316-009	EP2407316-010
					Result	Result	Result	Result	Result
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	<1	<1	<1	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	<1	<1	<1	<1
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		123	122	196	126	128
Total Alkalinity as CaCO3	----	1	mg/L		123	122	196	126	128
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		2280	2280	2210	2320	2250
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		18100	17800	17000	18300	17400
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		454	441	441	437	440
Magnesium	7439-95-4	1	mg/L		1430	1400	1330	1380	1380
Sodium	7440-23-5	1	mg/L		10800	10700	10000	10500	10500
Potassium	7440-09-7	1	mg/L		610	595	564	586	588
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		560	552	529	567	540
ø Total Cations	----	0.01	meq/L		626	618	581	607	607
ø Ionic Balance	----	0.01	%		5.50	5.63	4.63	3.41	5.84
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

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_SW311_240528	0089_SW309_240528	0089_PW306_240528	0089_PW314_240528	0089_SW412_240528
				Sampling date / time	28-May-2024 10:48	28-May-2024 10:49	28-May-2024 10:50	28-May-2024 10:51	28-May-2024 12:25
Compound	CAS Number	LOR	Unit		EP2407316-006	EP2407316-007	EP2407316-008	EP2407316-009	EP2407316-010
					Result	Result	Result	Result	Result
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
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									

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_SW311_240528	0089_SW309_240528	0089_PW306_240528	0089_PW314_240528	0089_SW412_240528
				Sampling date / time	28-May-2024 10:48	28-May-2024 10:49	28-May-2024 10:50	28-May-2024 10:51	28-May-2024 12:25
Compound	CAS Number	LOR	Unit		EP2407316-006	EP2407316-007	EP2407316-008	EP2407316-009	EP2407316-010
					Result	Result	Result	Result	Result
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
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	%		**107**	**103**	**95.5**	**98.2**	**109**
13C8-PFOA	----	0.02	%		**90.8**	**101**	**101**	**98.2**	**89.2**

Surrogate Control Limits

Sub-Matrix: MARINE WATER		Recovery Limits (%)	
Compound	CAS Number	Low	High
EP231S: PFAS Surrogate			
13C4-PFOS	----	65	140
13C8-PFOA	----	71	133

Sub-Matrix: SURFACE WATER		Recovery Limits (%)	
Compound	CAS Number	Low	High
EP231S: PFAS Surrogate			
13C4-PFOS	----	65	140
13C8-PFOA	----	71	133

QUALITY CONTROL REPORT

Work Order	: **EP2407316**	Page	: 1 of 11
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: [redacted]
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: +61-8-9406 1301
Project	: WA_0089_PFASOMP_24	Date Samples Received	: 29-May-2024
Order number	: pfas-omp/Stirling	Date Analysis Commenced	: 31-May-2024
C-O-C number	: 68293	Issue Date	: 10-Jun-2024
Sampler	: [redacted]		
Site	: Stirling SW/PW - MB		
Quote number	: SY/139/19 B		
No. of samples received	: 16		
No. of samples analysed	: 16		

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]	Inorganics Supervisor	Perth Inorganics, Wangara, WA
[redacted]	Laboratory Manager (Perth)	Perth Inorganics, Wangara, WA
[redacted]	Senior Organic Chemist	Perth Organics, Wangara, WA

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 (%)
ED037P: Alkalinity by PC Titrator (QC Lot: 5828915)									
EP2407316-002	0089_PW315_240528	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	124	123	0.0	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	124	123	0.0	0% - 20%
EP2407316-012	0089_SW416_240528	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	128	128	0.0	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	128	128	0.0	0% - 20%
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QC Lot: 5827147)									
EP2407275-001	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	2530	2570	1.6	0% - 20%
EP2407316-007	0089_SW309_240528	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	2280	2260	0.8	0% - 20%
ED045G: Chloride by Discrete Analyser (QC Lot: 5827148)									
EP2407275-001	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	18200	17600	3.1	0% - 20%
EP2407316-007	0089_SW309_240528	ED045G: Chloride	16887-00-6	1	mg/L	17800	17200	3.0	0% - 20%
ED093F: Dissolved Major Cations (QC Lot: 5827901)									
EP2407316-001	0089_PW308_240528	ED093F: Calcium	7440-70-2	1	mg/L	441	440	0.3	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	1370	1370	0.1	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	10400	10400	0.5	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	581	582	0.0	0% - 20%
EP2407384-005	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	160	164	2.2	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	41	42	0.0	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	239	242	1.0	0% - 20%

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 (%)
ED093F: Dissolved Major Cations (QC Lot: 5827901) - continued									
EP2407384-005	Anonymous	ED093F: Potassium	7440-09-7	1	mg/L	17	17	0.0	0% - 50%
ED093F: Dissolved Major Cations (QC Lot: 5827902)									
EP2407316-010	0089_SW412_240528	ED093F: Calcium	7440-70-2	1	mg/L	440	438	0.3	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	1380	1380	0.0	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	10500	10500	0.1	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	588	588	0.0	0% - 20%
EP2407384-010	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	80	80	0.0	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	11	10	0.0	0% - 50%
		ED093F: Sodium	7440-23-5	1	mg/L	25	23	6.4	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	4	4	0.0	No Limit
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 5838152)									
EP2407316-001	0089_PW308_240528	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: 5838188)									
EP2407306-002	Anonymous	EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	1.59	1.64	3.0	0% - 20%
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	5.61	6.72	18.0	0% - 20%
		EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	0.08	0.08	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	0.03	0.03	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	0.49	0.56	12.9	0% - 20%
		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: 5838152)									
EP2407316-001	0089_PW308_240528	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: 5838188)									

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: 5838188) - continued									
EP2407306-002	Anonymous	EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	0.18	0.18	5.7	0% - 50%
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	0.31	0.32	0.0	0% - 50%
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	0.30	0.30	0.0	0% - 50%
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	0.14	0.13	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	0.03	0.04	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: 5838152)									
EP2407316-001	0089_PW308_240528	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: 5838188)									
EP2407306-002	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

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: 5838152)									
EP2407316-001	0089_PW308_240528	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: 5838188)									
EP2407306-002	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	0.06	0.06	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: 5838152)									
EP2407316-001	0089_PW308_240528	EP231X: Sum of PFAS	----	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	<0.01	<0.01	0.0	No Limit
EP231P: PFAS Sums (QC Lot: 5838188)									
EP2407306-002	Anonymous	EP231X: Sum of PFAS	----	0.01	µg/L	8.92	10.2	13.0	0% - 20%
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	7.20	8.36	14.9	0% - 20%
		EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	8.37	9.53	13.0	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
ED037P: Alkalinity by PC Titrator (QCLot: 5828915)								
ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	----	----	----	----
ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	----	----	----	----
ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	<1	----	----	----	----
ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	<1	20 mg/L	94.6	85.1	126
				<1	200 mg/L	99.4	90.5	111
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 5827147)								
ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<1	25 mg/L	99.3	89.9	112
				<1	500 mg/L	104	89.9	112
ED045G: Chloride by Discrete Analyser (QCLot: 5827148)								
ED045G: Chloride	16887-00-6	1	mg/L	<1	10 mg/L	102	88.6	113
				<1	1000 mg/L	101	88.6	113
ED093F: Dissolved Major Cations (QCLot: 5827901)								
ED093F: Calcium	7440-70-2	1	mg/L	<1	50 mg/L	101	86.5	117
ED093F: Magnesium	7439-95-4	1	mg/L	<1	50 mg/L	100	88.4	110
ED093F: Sodium	7440-23-5	1	mg/L	<1	50 mg/L	99.3	91.4	113
ED093F: Potassium	7440-09-7	1	mg/L	<1	50 mg/L	96.3	84.6	108
ED093F: Dissolved Major Cations (QCLot: 5827902)								
ED093F: Calcium	7440-70-2	1	mg/L	<1	50 mg/L	99.9	86.5	117
ED093F: Magnesium	7439-95-4	1	mg/L	<1	50 mg/L	99.1	88.4	110
ED093F: Sodium	7440-23-5	1	mg/L	<1	50 mg/L	98.2	91.4	113
ED093F: Potassium	7440-09-7	1	mg/L	<1	50 mg/L	95.2	84.6	108
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5838152)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.2218 µg/L	92.2	72.0	130
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.2352 µg/L	103	71.0	127
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	0.2373 µg/L	98.0	68.0	131
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.238 µg/L	108	69.0	134
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.232 µg/L	87.3	65.0	140
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.241 µg/L	88.2	53.0	142
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5838188)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.2218 µg/L	97.4	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
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5838188) - continued								
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.2352 µg/L	83.5	71.0	127
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	0.2373 µg/L	93.6	68.0	131
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.238 µg/L	105	69.0	134
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.232 µg/L	97.6	65.0	140
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.241 µg/L	101	53.0	142
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5838152)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	1.25 µg/L	101	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	116	72.0	129
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	0.25 µg/L	96.4	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	108	69.0	130
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	0.25 µg/L	87.8	71.0	129
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	0.25 µg/L	110	69.0	133
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	0.25 µg/L	98.2	72.0	134
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	0.25 µg/L	110	65.0	144
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	0.25 µg/L	102	71.0	132
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5838188)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	1.25 µg/L	97.2	73.0	129
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	0.25 µg/L	104	72.0	129
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	0.25 µg/L	111	72.0	129
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	0.25 µg/L	101	72.0	130
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	0.25 µg/L	96.6	71.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	0.25 µg/L	96.4	69.0	130
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	0.25 µg/L	97.0	71.0	129
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	0.25 µg/L	105	69.0	133
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	0.25 µg/L	102	72.0	134
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	0.25 µg/L	95.2	65.0	144
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	0.25 µg/L	100	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5838152)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.25 µg/L	90.4	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	0.625 µg/L	111	68.0	141
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	0.625 µg/L	81.0	60.5	138

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
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5838152) - continued								
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	0.625 µg/L	95.8	68.3	134
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	0.625 µg/L	105	62.2	138
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	0.25 µg/L	101	65.0	136
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	0.25 µg/L	81.4	61.0	135
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5838188)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.25 µg/L	96.6	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	0.625 µg/L	97.3	68.0	141
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	0.625 µg/L	102	60.5	138
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	0.625 µg/L	112	68.3	134
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	0.625 µg/L	93.6	62.2	138
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	0.25 µg/L	111	65.0	136
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	0.25 µg/L	99.4	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5838152)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.2343 µg/L	108	63.0	143
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	0.2378 µg/L	108	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	0.24 µg/L	126	67.0	138
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	0.241 µg/L	104	64.2	133
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5838188)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.2343 µg/L	111	63.0	143
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	0.2378 µg/L	105	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	0.24 µg/L	115	67.0	138
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	0.241 µg/L	98.5	64.2	133
EP231P: PFAS Sums (QCLot: 5838152)								
EP231X: Sum of PFAS	----	0.01	µg/L	<0.01	----	----	----	----
EP231X: Sum of PFHxS and PFOS	355-46-4/17 63-23-1	0.01	µg/L	<0.01	----	----	----	----
EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	<0.01	----	----	----	----
EP231P: PFAS Sums (QCLot: 5838188)								
EP231X: Sum of PFAS	----	0.01	µg/L	<0.01	----	----	----	----

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
EP231P: PFAS Sums (QCLot: 5838188) - continued								
EP231X: Sum of PFHxS and PFOS	355-46-4/17 63-23-1	0.01	µg/L	<0.01	----	----	----	----
EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	<0.01	----	----	----	----

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
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 5827147)							
EP2407275-001	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	100 mg/L	# Not Determined	70.4	130
ED045G: Chloride by Discrete Analyser (QCLot: 5827148)							
EP2407275-001	Anonymous	ED045G: Chloride	16887-00-6	200 mg/L	# Not Determined	70.0	130
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5838152)							
EP2407316-006	0089_SW311_240528	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.2218 µg/L	92.1	72.0	129
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.232 µg/L	98.9	71.0	127
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.2352 µg/L	94.8	68.0	129
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.238 µg/L	104	69.0	134
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.232 µg/L	94.0	65.0	140
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.241 µg/L	97.7	53.0	129
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5838188)							
EP2407316-013	0089_PW413_240528	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.2218 µg/L	92.2	72.0	129
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.232 µg/L	84.3	71.0	127
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.2352 µg/L	93.4	68.0	129
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.238 µg/L	95.4	69.0	134
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.232 µg/L	99.4	65.0	140
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.241 µg/L	76.6	53.0	129
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5838152)							
EP2407316-006	0089_SW311_240528	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	1.25 µg/L	98.1	73.0	142
		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	116	72.0	129
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.25 µg/L	103	72.0	130
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.25 µg/L	115	71.0	133
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.25 µg/L	101	69.0	130

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: 5838152) - continued							
EP2407316-006	0089_SW311_240528	EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.25 µg/L	111	71.0	134
		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	104	65.0	144
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.25 µg/L	100	71.0	132
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5838188)							
EP2407316-013	0089_PW413_240528	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	1.25 µg/L	111	73.0	142
		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	102	72.0	129
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.25 µg/L	91.9	72.0	130
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.25 µg/L	93.1	71.0	133
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.25 µg/L	93.0	69.0	130
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.25 µg/L	93.6	71.0	134
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.25 µg/L	108	69.0	133
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.25 µg/L	96.6	72.0	134
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.25 µg/L	92.8	65.0	144
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.25 µg/L	100	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5838152)							
EP2407316-006	0089_SW311_240528	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.25 µg/L	88.1	59.0	135
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.625 µg/L	103	70.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.625 µg/L	88.2	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.625 µg/L	99.7	70.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.625 µg/L	97.0	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.25 µg/L	97.8	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: 5838188)							
EP2407316-013	0089_PW413_240528	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.25 µg/L	97.6	59.0	135
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.625 µg/L	91.6	70.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.625 µg/L	92.6	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.625 µg/L	106	70.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.625 µg/L	102	70.0	130

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: 5838188) - continued							
EP2407316-013	0089_PW413_240528	EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.25 µg/L	101	65.0	136
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.25 µg/L	92.4	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5838152)							
EP2407316-006	0089_SW311_240528	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.234 µg/L	112	63.0	143
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.2378 µg/L	107	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.24 µg/L	111	67.0	138
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.2415 µg/L	92.5	70.0	130
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5838188)							
EP2407316-013	0089_PW413_240528	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.234 µg/L	104	63.0	143
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.2378 µg/L	93.1	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.24 µg/L	109	67.0	138
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.2415 µg/L	74.5	70.0	130

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **EP2407316**	Page	: 1 of 7
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Telephone	: +61-8-9406 1301
Project	: WA_0089_PFASOMP_24	Date Samples Received	: 29-May-2024
Site	: Stirling SW/PW - MB	Issue Date	: 10-Jun-2024
Sampler	: [redacted]	No. of samples received	: 16
Order number	: pfas-omp/Stirling	No. of samples analysed	: 16

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.**
- **Matrix Spike outliers exist - please see following pages for full details.**
- **For all regular sample matrices, where applicable to the methodology, 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 : Quality Control Samples

Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

Matrix: **WATER**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
Matrix Spike (MS) Recoveries							
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA	EP2407275--001	Anonymous	**Sulfate as SO4 - Turbidimetric**	14808-79-8	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
ED045G: Chloride by Discrete Analyser	EP2407275--001	Anonymous	**Chloride**	16887-00-6	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**

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	2	35	5.71	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*
ED037P: Alkalinity by PC Titrator								
Clear Plastic Bottle - Natural (ED037-P)								
0089_PW308_240528,	0089_PW315_240528,	**28-May-2024**	**----**	----	**----**	**31-May-2024**	11-Jun-2024	✓
0089_PW307_240528,	0089_SW310_240528,							
0089_SW311_240528,	0089_SW309_240528,							
0089_PW306_240528,	0089_PW314_240528,							
0089_SW412_240528,	0089_PW415_240528,							
0089_SW416_240528,	0089_PW413_240528,							
0089_SW414_240528,	0089_PW411_240528							

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
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA								
Clear Plastic Bottle - Natural (ED041G)								
0089_PW308_240528,	0089_PW315_240528,	**28-May-2024**	**----**	----	**----**	**07-Jun-2024**	25-Jun-2024	✓
0089_PW307_240528,	0089_SW310_240528,							
0089_SW311_240528,	0089_SW309_240528,							
0089_PW306_240528,	0089_PW314_240528,							
0089_SW412_240528,	0089_PW415_240528,							
0089_SW416_240528,	0089_PW413_240528,							
0089_SW414_240528,	0089_PW411_240528							
ED045G: Chloride by Discrete Analyser								
Clear Plastic Bottle - Natural (ED045G)								
0089_PW308_240528,	0089_PW315_240528,	**28-May-2024**	**----**	----	**----**	**07-Jun-2024**	25-Jun-2024	✓
0089_PW307_240528,	0089_SW310_240528,							
0089_SW311_240528,	0089_SW309_240528,							
0089_PW306_240528,	0089_PW314_240528,							
0089_SW412_240528,	0089_PW415_240528,							
0089_SW416_240528,	0089_PW413_240528,							
0089_SW414_240528,	0089_PW411_240528							
ED093F: Dissolved Major Cations								
Clear Plastic Bottle - Natural (ED093F)								
0089_PW308_240528,	0089_PW315_240528,	**28-May-2024**	**----**	----	**----**	**04-Jun-2024**	04-Jun-2024	✓
0089_PW307_240528,	0089_SW310_240528,							
0089_SW311_240528,	0089_SW309_240528,							
0089_PW306_240528,	0089_PW314_240528,							
0089_SW412_240528,	0089_PW415_240528,							
0089_SW416_240528,	0089_PW413_240528,							
0089_SW414_240528,	0089_PW411_240528							
EP231A: Perfluoroalkyl Sulfonic Acids								
HDPE (no PTFE) (EP231X)								
0089_PW308_240528,	0089_PW315_240528,	**28-May-2024**	**05-Jun-2024**	24-Nov-2024	✓	**06-Jun-2024**	24-Nov-2024	✓
0089_QC111_240528,	0089_SW310_240528,							
0089_SW311_240528,	0089_SW309_240528,							
0089_SW412_240528,	0089_SW416_240528,							
0089_SW414_240528,	0089_QC116_240528							
HDPE (no PTFE) (EP231X)								
0089_PW307_240528,	0089_PW306_240528,	**28-May-2024**	**06-Jun-2024**	24-Nov-2024	✓	**07-Jun-2024**	24-Nov-2024	✓
0089_PW314_240528,	0089_PW415_240528,							
0089_PW413_240528,	0089_PW411_240528							

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)								
0089_PW308_240528,	0089_PW315_240528,	**28-May-2024**	**05-Jun-2024**	24-Nov-2024	✓	**06-Jun-2024**	24-Nov-2024	✓
0089_QC111_240528,	0089_SW310_240528,							
0089_SW311_240528,	0089_SW309_240528,							
0089_SW412_240528,	0089_SW416_240528,							
0089_SW414_240528,	0089_QC116_240528							
HDPE (no PTFE) (EP231X)								
0089_PW307_240528,	0089_PW306_240528,	**28-May-2024**	**06-Jun-2024**	24-Nov-2024	✓	**07-Jun-2024**	24-Nov-2024	✓
0089_PW314_240528,	0089_PW415_240528,							
0089_PW413_240528,	0089_PW411_240528							
EP231C: Perfluoroalkyl Sulfonamides								
HDPE (no PTFE) (EP231X)								
0089_PW308_240528,	0089_PW315_240528,	**28-May-2024**	**05-Jun-2024**	24-Nov-2024	✓	**06-Jun-2024**	24-Nov-2024	✓
0089_QC111_240528,	0089_SW310_240528,							
0089_SW311_240528,	0089_SW309_240528,							
0089_SW412_240528,	0089_SW416_240528,							
0089_SW414_240528,	0089_QC116_240528							
HDPE (no PTFE) (EP231X)								
0089_PW307_240528,	0089_PW306_240528,	**28-May-2024**	**06-Jun-2024**	24-Nov-2024	✓	**07-Jun-2024**	24-Nov-2024	✓
0089_PW314_240528,	0089_PW415_240528,							
0089_PW413_240528,	0089_PW411_240528							
EP231D: (n:2) Fluorotelomer Sulfonic Acids								
HDPE (no PTFE) (EP231X)								
0089_PW308_240528,	0089_PW315_240528,	**28-May-2024**	**05-Jun-2024**	24-Nov-2024	✓	**06-Jun-2024**	24-Nov-2024	✓
0089_QC111_240528,	0089_SW310_240528,							
0089_SW311_240528,	0089_SW309_240528,							
0089_SW412_240528,	0089_SW416_240528,							
0089_SW414_240528,	0089_QC116_240528							
HDPE (no PTFE) (EP231X)								
0089_PW307_240528,	0089_PW306_240528,	**28-May-2024**	**06-Jun-2024**	24-Nov-2024	✓	**07-Jun-2024**	24-Nov-2024	✓
0089_PW314_240528,	0089_PW415_240528,							
0089_PW413_240528,	0089_PW411_240528							

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)							
0089_PW308_240528, 0089_PW315_240528, 0089_QC111_240528, 0089_SW310_240528, 0089_SW311_240528, 0089_SW309_240528, 0089_SW412_240528, 0089_SW416_240528, 0089_SW414_240528, 0089_QC116_240528	**28-May-2024**	**05-Jun-2024**	24-Nov-2024	✓	**06-Jun-2024**	24-Nov-2024	✓
HDPE (no PTFE) (EP231X)							
0089_PW307_240528, 0089_PW306_240528, 0089_PW314_240528, 0089_PW415_240528, 0089_PW413_240528, 0089_PW411_240528	**28-May-2024**	**06-Jun-2024**	24-Nov-2024	✓	**07-Jun-2024**	24-Nov-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)							
Alkalinity by Auto Titrator	ED037-P	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	4	37	**10.81**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	35	**5.71**	**10.00**	×	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Alkalinity by Auto Titrator	ED037-P	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	2	37	**5.41**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	35	**5.71**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Alkalinity by Auto Titrator	ED037-P	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	2	37	**5.41**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	35	**5.71**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Chloride by Discrete Analyser	ED045G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	35	**5.71**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	20	**5.00**	**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
Alkalinity by Auto Titrator	ED037-P	WATER	In house: Referenced to APHA 2320 B This procedure determines alkalinity by automated measurement (e.g. PC Titrate) on a settled supernatant aliquot of the sample using pH 4.5 for indicating the total alkalinity end-point. This method is compliant with NEPM Schedule B(3)
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	WATER	In house: Referenced to APHA 4500-SO4. Dissolved sulfate is determined in a 0.45um filtered sample. Sulfate ions are converted to a barium sulfate suspension in an acetic acid medium with barium chloride. Light absorbance of the BaSO4 suspension is measured by a photometer and the SO4-2 concentration is determined by comparison of the reading with a standard curve. This method is compliant with NEPM Schedule B(3)
Chloride by Discrete Analyser	ED045G	WATER	In house: Referenced to APHA 4500 Cl - G.The thiocyanate ion is liberated from mercuric thiocyanate through sequestration of mercury by the chloride ion to form non-ionised mercuric chloride. In the presence of ferric ions the liberated thiocynate forms highly-coloured ferric thiocynate which is measured at 480 nm.
Major Cations - Dissolved	ED093F	WATER	In house: Referenced to APHA 3120 and 3125; USEPA SW 846 - 6010 and 6020; Cations are determined by either ICP-AES or ICP-MS techniques. This method is compliant with NEPM Schedule B(3) Sodium Adsorption Ratio is calculated from Ca, Mg and Na which determined by ALS in house method QWI-EN/ED093F. This method is compliant with NEPM Schedule B(3) Hardness parameters are calculated based on APHA 2340 B. This method is compliant with NEPM Schedule B(3)
Ionic Balance by PCT DA and Turbi SO4 DA	* EN055 - PG	WATER	In house: Referenced to APHA 1030F. This method is compliant with NEPM Schedule B(3)
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.

ALSCompass
SAMPLING *Intelligence*

ALS

Environmental Division
Perth
Work Order Reference
EP2407335

Telephone : +61-8-9406 1301

Custody Document for Submissions via ALS Compass App

Project: WA-0089-PPASOMP24 Client: STANTEC Project Manager: [redacted]

Phone: ( )

ALS Compass COC Reference: 68276 # Samples: 68293 68221 68274 68275 68271 68265 68272 68267 Sampler: [redacted]

Phone: ( )

Turnaround Requirements: Standard / Urgent

Special Instructions:

Custody:

Relinquished by:	Received by:	Relinquished by:	Received by:
STANTEC	[redacted]		
Date / Time: 28/5/24 4 PM	Date / Time: 29/5 1230	Date / Time:	Date / Time:

CHAIN OF CUSTODY

COC#: 68271 *ALS Laboratory:* EP Perth Environmental

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

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP_24

SITE: Stirling GW - CG

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted] derp.labreports@esdat.com.au

EMAIL INVOICES 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	WA OMP Water Suite WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
001	0089_MW139		28/05/2024 09:02 AM	WATER	ALS: 3 Non ALS: 0	No	X		
002	0089_QC108		28/05/2024 09:02 AM	WATER	ALS: 3 Non ALS: 0	No	X		
003	0089_MW141		28/05/2024 09:23 AM	WATER	ALS: 3 Non ALS: 0	No	X		
004	0089_MW142		28/05/2024 09:25 AM	WATER	ALS: 3 Non ALS: 0	No	X		
005	0089_MW147		28/05/2024 09:50 AM	WATER	ALS: 3 Non ALS: 0	No	X		
006	0089_MW149		28/05/2024 10:05 AM	WATER	ALS: 3 Non ALS: 0	No	X		

CHAIN OF CUSTODY

COC#: 68271 *ALS Laboratory:* EP Perth Environmental

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

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP_24

SITE: Stirling GW - CG

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]derp.labreports@esdat.com.au

EMAIL INVOICES 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	0089_MW139	HDPE (no PTFE)	20 mL	00351221024621	Grey	No	
001	0089_MW139	HDPE (no PTFE)	20 mL	00351221024828	Grey	No	
001	0089_MW139	Clear Plastic Bottle - Natural	125 mL	00071121178092	Green	No	
002	0089_QC108	Clear Plastic Bottle - Natural	125 mL	00071121178090	Green	No	
002	0089_QC108	HDPE (no PTFE)	20 mL	00351221024720	Grey	No	
002	0089_QC108	HDPE (no PTFE)	20 mL	00352312048697	Grey	No	
003	0089_MW141	Clear Plastic Bottle - Natural	125 mL	00071121177927	Green	No	
003	0089_MW141	HDPE (no PTFE)	20 mL	00351221024873	Grey	No	
003	0089_MW141	HDPE (no PTFE)	20 mL	00351221024869	Grey	No	
004	0089_MW142	HDPE (no PTFE)	20 mL	00351221024646	Grey	No	
004	0089_MW142	HDPE (no PTFE)	20 mL	00351221024819	Grey	No	
004	0089_MW142	Clear Plastic Bottle - Natural	125 mL	00071121178035	Green	No	
005	0089_MW147	HDPE (no PTFE)	20 mL	00351221024859	Grey	No	
005	0089_MW147	HDPE (no PTFE)	20 mL	00353336357369	Grey	No	
005	0089_MW147	Clear Plastic Bottle - Natural	125 mL	00071121178045	Green	No	
006	0089_MW149	Clear Plastic Bottle - Natural	125 mL	00070821217708	Green	No	
006	0089_MW149	HDPE (no PTFE)	20 mL	00351221024639	Grey	No	
006	0089_MW149	HDPE (no PTFE)	20 mL	00352312048653	Grey	No	

Total Bottle Count: ALS: 18, Non ALS: 0

SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : **EP2407335**

Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: [redacted]
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
E-mail	: [redacted]stantec.com	E-mail	: [redacted]alsglobal.com
Telephone	: ----	Telephone	: +61-8-9406 1301
Facsimile	: ----	Facsimile	: +61-8-9406 1399
Project	: WA_0089_PFASOMP_24	Page	: 1 of 2
Order number	: pfas-omp/Stirling	Quote number	: ES2022MWHAUS0002 (SY/139/19 B)
C-O-C number	: 68271	QC Level	: NEPM 2013 B3 & ALS QC Standard
Site	: Stirling GW - CG		
Sampler	: [redacted]		

Dates

Date Samples Received	: 29-May-2024 12:30	Issue Date	: 30-May-2024
Client Requested Due Date	: 10-Jun-2024	Scheduled Reporting Date	: **10-Jun-2024**

Delivery Details

Mode of Delivery	: Carrier	Security Seal	: Not Available
No. of coolers/boxes	: 2	Temperature	: 14.1 - Ice present
Receipt Detail	:	No. of samples received / analysed	: 6 / 6

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 see scanned COC for sample discrepencies: extra samples , samples not received etc.
- Please direct any queries related to sample condition / numbering / breakages to Sample Receipt (Samples.Perth@alsglobal.com)
- Analytical work for this work order will be conducted at ALS Environmental Perth.
- Please direct any turnaround / technical queries to the laboratory contact designated above.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months) from receipt of samples.
- **pH analysis should be conducted within 6 hours of sampling.**
- **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.**
- 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 (30 analytes)	WATER - NT-01 & 02 Ca, Mg, Na, K, Cl, SO4, Alkalinity
EP2407335-001	28-May-2024 09:02	0089_MW139_240528	✓	✓
EP2407335-002	28-May-2024 09:02	0089_QC108_240528	✓	✓
EP2407335-003	28-May-2024 09:23	0089_MW141_240528	✓	✓
EP2407335-004	28-May-2024 09:25	0089_MW142_240528	✓	✓
EP2407335-005	28-May-2024 09:50	0089_MW147_240528	✓	✓
EP2407335-006	28-May-2024 10:05	0089_MW149_240528	✓	✓

Proactive Holding Time Report

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

Requested Deliverables

[redacted]
- A4 - AU Tax Invoice (INV) — Email — [redacted]cardno.com.au

DERP LAB REPORTS
- EDI Format - ESDAT (ESDAT) — Email — derp.labreports@esdat.com.au

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

CERTIFICATE OF ANALYSIS

Work Order	: **EP2407335**	Page	: 1 of 9
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: [redacted]
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: +61-8-9406 1301
Project	: WA_0089_PFASOMP_24	Date Samples Received	: 29-May-2024 12:30
Order number	: pfas-omp/Stirling	Date Analysis Commenced	: 31-May-2024
C-O-C number	: 68271	Issue Date	: 10-Jun-2024 16:31
Sampler	: [redacted]		
Site	: Stirling GW - CG		
Quote number	: SY/139/19 B		
No. of samples received	: 6		
No. of samples analysed	: 6		

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]	Laboratory Manager (Perth)	Perth Inorganics, Wangara, WA
[redacted]	Senior Organic Chemist	Perth Organics, Wangara, WA

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.
- As per QWI – EN55-3 Data Interpreting Procedures, Ionic balances are typically calculated using Major Anions - Chloride, Alkalinity and Sulfate; and Major Cations - Calcium, Magnesium, Potassium and Sodium. Where applicable and dependent upon sample matrix, the Ionic Balance may also include the additional contribution of Ammonia, Dissolved Metals by ICPMS and H+ to the Cations and Nitrate, SiO2 and Fluoride to the Anions.
- Sodium Adsorption Ratio (where reported): Where results for Na, Ca or Mg are <LOR, a concentration at half the reported LOR is incorporated into the SAR calculation. This represents a conservative approach for Na relative to the assumption that <LOR = zero concentration and a conservative approach for Ca & Mg relative to the assumption that <LOR is equivalent to the LOR concentration.
- 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.
- ED045G: The presence of Thiocyanate, Thiosulfate and Sulfite can positively contribute to the chloride result, thereby may bias results higher than expected. Results should be scrutinised accordingly.

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW139_240528	0089_QC108_240528	0089_MW141_240528	0089_MW142_240528	0089_MW147_240528
				Sampling date / time	28-May-2024 09:02	28-May-2024 09:02	28-May-2024 09:23	28-May-2024 09:25	28-May-2024 09:50
Compound	CAS Number	LOR	Unit		EP2407335-001	EP2407335-002	EP2407335-003	EP2407335-004	EP2407335-005
					Result	Result	Result	Result	Result
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	<1	<1	<1	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	<1	<1	<1	<1
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		266	283	353	408	481
Total Alkalinity as CaCO3	----	1	mg/L		266	283	353	408	481
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		286	361	1480	1840	1070
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		3300	3940	10000	12200	7380
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		215	233	400	408	357
Magnesium	7439-95-4	1	mg/L		217	266	865	1040	634
Sodium	7440-23-5	1	mg/L		1420	1740	6000	7370	4350
Potassium	7440-09-7	1	mg/L		76	94	321	410	217
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		104	124	320	391	240
ø Total Cations	----	0.01	meq/L		92.3	112	360	437	265
ø Ionic Balance	----	0.01	%		6.13	5.38	5.94	5.61	4.89
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		<0.02	<0.02	0.21	0.08	<0.02
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		<0.02	<0.02	0.36	0.13	<0.02
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		<0.01	<0.01	7.66	1.74	0.10
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		<0.02	<0.02	0.81	0.05	<0.02
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		<0.01	<0.01	21.5	1.31	0.01
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW139_240528	0089_QC108_240528	0089_MW141_240528	0089_MW142_240528	0089_MW147_240528
				Sampling date / time	28-May-2024 09:02	28-May-2024 09:02	28-May-2024 09:23	28-May-2024 09:25	28-May-2024 09:50
Compound	CAS Number	LOR	Unit		EP2407335-001	EP2407335-002	EP2407335-003	EP2407335-004	EP2407335-005
					Result	Result	Result	Result	Result
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	**0.42**	**0.16**	<0.02
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		<0.02	<0.02	**3.67**	**1.29**	<0.02
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		<0.02	<0.02	**0.14**	**0.03**	<0.02
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		<0.01	<0.01	**0.67**	**0.13**	<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
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									

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW139_240528	0089_QC108_240528	0089_MW141_240528	0089_MW142_240528	0089_MW147_240528
				Sampling date / time	28-May-2024 09:02	28-May-2024 09:02	28-May-2024 09:23	28-May-2024 09:25	28-May-2024 09:50
Compound	CAS Number	LOR	Unit		EP2407335-001	EP2407335-002	EP2407335-003	EP2407335-004	EP2407335-005
					Result	Result	Result	Result	Result
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
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	**35.6**	**4.92**	**0.11**
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		<0.01	<0.01	**29.2**	**3.05**	**0.11**
Sum of PFAS (WA DER List)	----	0.01	µg/L		<0.01	<0.01	**34.4**	**4.74**	**0.11**
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**102**	**105**	**92.2**	**99.9**	**103**
13C8-PFOA	----	0.02	%		**88.3**	**97.4**	**100**	**98.3**	**89.5**

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW149_240528	----	----	----	----
				Sampling date / time	28-May-2024 10:05	----	----	----	----
Compound	CAS Number	LOR	Unit		EP2407335-006	--------	--------	--------	--------
					Result	----	----	----	----
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	----	----	----	----
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	----	----	----	----
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		**298**	----	----	----	----
Total Alkalinity as CaCO3	----	1	mg/L		**298**	----	----	----	----
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		**2330**	----	----	----	----
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		**15100**	----	----	----	----
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		**425**	----	----	----	----
Magnesium	7439-95-4	1	mg/L		**1260**	----	----	----	----
Sodium	7440-23-5	1	mg/L		**9070**	----	----	----	----
Potassium	7440-09-7	1	mg/L		**519**	----	----	----	----
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		**480**	----	----	----	----
ø Total Cations	----	0.01	meq/L		**533**	----	----	----	----
ø Ionic Balance	----	0.01	%		**5.16**	----	----	----	----
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	----	----	----	----

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW149_240528	----	----	----	----
				Sampling date / time	28-May-2024 10:05	----	----	----	----
Compound	CAS Number	LOR	Unit		EP2407335-006	--------	--------	--------	--------
					Result	----	----	----	----
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	----	----	----	----
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									

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW149_240528	----	----	----	----
				Sampling date / time	28-May-2024 10:05	----	----	----	----
Compound	CAS Number	LOR	Unit		EP2407335-006	--------	--------	--------	--------
					Result	----	----	----	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
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	%		**104**	----	----	----	----
13C8-PFOA	----	0.02	%		**87.7**	----	----	----	----

Surrogate Control Limits

Sub-Matrix: **GROUNDWATER**		Recovery Limits (%)	
Compound	*CAS Number*	*Low*	*High*
EP231S: PFAS Surrogate			
13C4-PFOS	----	65	140
13C8-PFOA	----	71	133

QUALITY CONTROL REPORT

Work Order	: **EP2407335**	Page	: 1 of 11
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: [redacted]
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: +61-8-9406 1301
Project	: WA_0089_PFASOMP_24	Date Samples Received	: 29-May-2024
Order number	: pfas-omp/Stirling	Date Analysis Commenced	: 31-May-2024
C-O-C number	: 68271	Issue Date	: 10-Jun-2024
Sampler	: [redacted] [redacted]		
Site	: Stirling GW - CG		
Quote number	: SY/139/19 B		
No. of samples received	: 6		
No. of samples analysed	: 6		

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]	Laboratory Manager (Perth)	Perth Inorganics, Wangara, WA
[redacted]	Senior Organic Chemist	Perth Organics, Wangara, WA

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 (%)
ED037P: Alkalinity by PC Titrator (QC Lot: 5828915)									
EP2407316-002	Anonymous	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	124	123	0.0	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	124	123	0.0	0% - 20%
EP2407316-012	Anonymous	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	128	128	0.0	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	128	128	0.0	0% - 20%
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QC Lot: 5827144)									
EP2407030-023	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	1110	1090	1.5	0% - 20%
EP2407273-004	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	286	286	0.0	0% - 20%
ED045G: Chloride by Discrete Analyser (QC Lot: 5827143)									
EP2407030-023	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	7320	7340	0.1	0% - 20%
EP2407273-004	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	908	900	0.9	0% - 20%
ED093F: Dissolved Major Cations (QC Lot: 5827886)									
EP2407030-023	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	247	245	1.0	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	640	631	1.4	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	4520	4470	1.1	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	254	250	1.4	0% - 20%
EP2407337-004	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	444	445	0.0	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	1380	1380	0.0	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	10400	10400	0.8	0% - 20%

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 (%)
ED093F: Dissolved Major Cations (QC Lot: 5827886) - continued									
EP2407337-004	Anonymous	ED093F: Potassium	7440-09-7	1	mg/L	589	583	0.9	0% - 20%
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 5838152)									
EP2407316-001	Anonymous	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: 5838188)									
EP2407306-002	Anonymous	EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	1.59	1.64	3.0	0% - 20%
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	5.61	6.72	18.0	0% - 20%
		EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	0.08	0.08	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	0.03	0.03	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	0.49	0.56	12.9	0% - 20%
		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: 5838152)									
EP2407316-001	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
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 5838188)									
EP2407306-002	Anonymous	EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	0.18	0.18	5.7	0% - 50%
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	0.31	0.32	0.0	0% - 50%
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	0.30	0.30	0.0	0% - 50%
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	0.14	0.13	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	0.03	0.04	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

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: 5838188) - continued									
EP2407306-002	Anonymous	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: 5838152)									
EP2407316-001	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
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 5838188)									
EP2407306-002	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: 5838152)									
EP2407316-001	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
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 5838188)									

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: 5838188) - continued									
EP2407306-002	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	0.06	0.06	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: 5838152)									
EP2407316-001	Anonymous	EP231X: Sum of PFAS	----	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	<0.01	<0.01	0.0	No Limit
EP231P: PFAS Sums (QC Lot: 5838188)									
EP2407306-002	Anonymous	EP231X: Sum of PFAS	----	0.01	µg/L	8.92	10.2	13.0	0% - 20%
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	7.20	8.36	14.9	0% - 20%
		EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	8.37	9.53	13.0	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
ED037P: Alkalinity by PC Titrator (QCLot: 5828915)								
ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	----	----	----	----
ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	----	----	----	----
ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	<1	----	----	----	----
ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	<1	20 mg/L	94.6	85.1	126
				<1	200 mg/L	99.4	90.5	111
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 5827144)								
ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<1	25 mg/L	103	89.9	112
				<1	500 mg/L	97.7	89.9	112
ED045G: Chloride by Discrete Analyser (QCLot: 5827143)								
ED045G: Chloride	16887-00-6	1	mg/L	<1	10 mg/L	96.1	88.6	113
				<1	1000 mg/L	95.6	88.6	113
ED093F: Dissolved Major Cations (QCLot: 5827886)								
ED093F: Calcium	7440-70-2	1	mg/L	<1	50 mg/L	103	86.5	117
ED093F: Magnesium	7439-95-4	1	mg/L	<1	50 mg/L	103	88.4	110
ED093F: Sodium	7440-23-5	1	mg/L	<1	50 mg/L	99.7	91.4	113
ED093F: Potassium	7440-09-7	1	mg/L	<1	50 mg/L	96.9	84.6	108
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5838152)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.2218 µg/L	92.2	72.0	130
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.2352 µg/L	103	71.0	127
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	0.2373 µg/L	98.0	68.0	131
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.238 µg/L	108	69.0	134
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.232 µg/L	87.3	65.0	140
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.241 µg/L	88.2	53.0	142
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5838188)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.2218 µg/L	97.4	72.0	130
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.2352 µg/L	83.5	71.0	127
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	0.2373 µg/L	93.6	68.0	131
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.238 µg/L	105	69.0	134
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.232 µg/L	97.6	65.0	140
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.241 µg/L	101	53.0	142

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: 5838152)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	1.25 µg/L	101	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	116	72.0	129
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	0.25 µg/L	96.4	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	108	69.0	130
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	0.25 µg/L	87.8	71.0	129
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	0.25 µg/L	110	69.0	133
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	0.25 µg/L	98.2	72.0	134
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	0.25 µg/L	110	65.0	144
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	0.25 µg/L	102	71.0	132
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5838188)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	1.25 µg/L	97.2	73.0	129
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	0.25 µg/L	104	72.0	129
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	0.25 µg/L	111	72.0	129
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	0.25 µg/L	101	72.0	130
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	0.25 µg/L	96.6	71.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	0.25 µg/L	96.4	69.0	130
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	0.25 µg/L	97.0	71.0	129
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	0.25 µg/L	105	69.0	133
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	0.25 µg/L	102	72.0	134
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	0.25 µg/L	95.2	65.0	144
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	0.25 µg/L	100	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5838152)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.25 µg/L	90.4	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	0.625 µg/L	111	68.0	141
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	0.625 µg/L	81.0	60.5	138
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	0.625 µg/L	95.8	68.3	134
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	0.625 µg/L	105	62.2	138
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	0.25 µg/L	101	65.0	136
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	0.25 µg/L	81.4	61.0	135

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: 5838188)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.25 µg/L	96.6	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	0.625 µg/L	97.3	68.0	141
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	0.625 µg/L	102	60.5	138
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	0.625 µg/L	112	68.3	134
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	0.625 µg/L	93.6	62.2	138
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	0.25 µg/L	111	65.0	136
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	0.25 µg/L	99.4	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5838152)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.2343 µg/L	108	63.0	143
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	0.2378 µg/L	108	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	0.24 µg/L	126	67.0	138
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	0.241 µg/L	104	64.2	133
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5838188)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.2343 µg/L	111	63.0	143
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	0.2378 µg/L	105	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	0.24 µg/L	115	67.0	138
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	0.241 µg/L	98.5	64.2	133
EP231P: PFAS Sums (QCLot: 5838152)								
EP231X: Sum of PFAS	----	0.01	µg/L	<0.01	----	----	----	----
EP231X: Sum of PFHxS and PFOS	355-46-4/17 63-23-1	0.01	µg/L	<0.01	----	----	----	----
EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	<0.01	----	----	----	----
EP231P: PFAS Sums (QCLot: 5838188)								
EP231X: Sum of PFAS	----	0.01	µg/L	<0.01	----	----	----	----
EP231X: Sum of PFHxS and PFOS	355-46-4/17 63-23-1	0.01	µg/L	<0.01	----	----	----	----
EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	<0.01	----	----	----	----

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**

Matrix Spike (MS) Report

Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*Concentration*	*MS*	*Low*	*High*
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 5827144)							
EP2407030-023	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	100 mg/L	# Not Determined	70.4	130
ED045G: Chloride by Discrete Analyser (QCLot: 5827143)							
EP2407030-023	Anonymous	ED045G: Chloride	16887-00-6	200 mg/L	# Not Determined	70.0	130
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5838152)							
EP2407316-006	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.2218 µg/L	92.1	72.0	129
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.232 µg/L	98.9	71.0	127
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.2352 µg/L	94.8	68.0	129
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.238 µg/L	104	69.0	134
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.232 µg/L	94.0	65.0	140
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.241 µg/L	97.7	53.0	129
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5838188)							
EP2407316-013	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.2218 µg/L	92.2	72.0	129
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.232 µg/L	84.3	71.0	127
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.2352 µg/L	93.4	68.0	129
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.238 µg/L	95.4	69.0	134
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.232 µg/L	99.4	65.0	140
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.241 µg/L	76.6	53.0	129
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5838152)							
EP2407316-006	Anonymous	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	1.25 µg/L	98.1	73.0	142
		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	116	72.0	129
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.25 µg/L	103	72.0	130
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.25 µg/L	115	71.0	133
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.25 µg/L	101	69.0	130
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.25 µg/L	111	71.0	134
		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	104	65.0	144
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.25 µg/L	100	71.0	132
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5838188)							
EP2407316-013	Anonymous	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	1.25 µg/L	111	73.0	142
		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	102	72.0	129
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.25 µg/L	91.9	72.0	130
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.25 µg/L	93.1	71.0	133
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.25 µg/L	93.0	69.0	130

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: 5838188) - continued							
EP2407316-013	Anonymous	EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.25 µg/L	93.6	71.0	134
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.25 µg/L	108	69.0	133
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.25 µg/L	96.6	72.0	134
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.25 µg/L	92.8	65.0	144
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.25 µg/L	100	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5838152)							
EP2407316-006	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.25 µg/L	88.1	59.0	135
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.625 µg/L	103	70.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.625 µg/L	88.2	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.625 µg/L	99.7	70.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.625 µg/L	97.0	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.25 µg/L	97.8	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: 5838188)							
EP2407316-013	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.25 µg/L	97.6	59.0	135
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.625 µg/L	91.6	70.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.625 µg/L	92.6	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.625 µg/L	106	70.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.625 µg/L	102	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.25 µg/L	101	65.0	136
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.25 µg/L	92.4	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5838152)							
EP2407316-006	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.234 µg/L	112	63.0	143
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.2378 µg/L	107	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.24 µg/L	111	67.0	138
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.2415 µg/L	92.5	70.0	130
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5838188)							
EP2407316-013	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.234 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: 5838188) - continued							
EP2407316-013	Anonymous	EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.2378 µg/L	93.1	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.24 µg/L	109	67.0	138
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.2415 µg/L	74.5	70.0	130

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **EP2407335**	Page	: 1 of 6
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Telephone	: +61-8-9406 1301
Project	: WA_0089_PFASOMP_24	Date Samples Received	: 29-May-2024
Site	: Stirling GW - CG	Issue Date	: 10-Jun-2024
Sampler	: [redacted] [redacted]	No. of samples received	: 6
Order number	: pfas-omp/Stirling	No. of samples analysed	: 6

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.**
- **Matrix Spike outliers exist - please see following pages for full details.**
- **For all regular sample matrices, where applicable to the methodology, 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 : Quality Control Samples

Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

Matrix: **WATER**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
Matrix Spike (MS) Recoveries							
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA	EP2407030--023	Anonymous	**Sulfate as SO4 - Turbidimetric**	14808-79-8	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
ED045G: Chloride by Discrete Analyser	EP2407030--023	Anonymous	**Chloride**	16887-00-6	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**

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	2	35	5.71	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*
ED037P: Alkalinity by PC Titrator								
Clear Plastic Bottle - Natural (ED037-P)								
0089_MW139_240528,	0089_QC108_240528,	**28-May-2024**	**----**	----	**----**	**31-May-2024**	11-Jun-2024	✓
0089_MW141_240528,	0089_MW142_240528,							
0089_MW147_240528,	0089_MW149_240528							
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA								
Clear Plastic Bottle - Natural (ED041G)								
0089_MW139_240528,	0089_QC108_240528,	**28-May-2024**	**----**	----	**----**	**05-Jun-2024**	25-Jun-2024	✓
0089_MW141_240528,	0089_MW142_240528,							
0089_MW147_240528,	0089_MW149_240528							

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
ED045G: Chloride by Discrete Analyser							
Clear Plastic Bottle - Natural (ED045G)							
0089_MW139_240528, 0089_QC108_240528, 0089_MW141_240528, 0089_MW142_240528, 0089_MW147_240528, 0089_MW149_240528	**28-May-2024**	**----**	----	----	**05-Jun-2024**	25-Jun-2024	✓
ED093F: Dissolved Major Cations							
Clear Plastic Bottle - Natural (ED093F)							
0089_MW139_240528, 0089_QC108_240528, 0089_MW141_240528, 0089_MW142_240528, 0089_MW147_240528, 0089_MW149_240528	**28-May-2024**	**----**	----	----	**31-May-2024**	04-Jun-2024	✓
EP231A: Perfluoroalkyl Sulfonic Acids							
HDPE (no PTFE) (EP231X)							
0089_MW139_240528, 0089_QC108_240528, 0089_MW142_240528, 0089_MW147_240528, 0089_MW149_240528	**28-May-2024**	**05-Jun-2024**	24-Nov-2024	✓	**06-Jun-2024**	24-Nov-2024	✓
HDPE (no PTFE) (EP231X)							
0089_MW141_240528	**28-May-2024**	**06-Jun-2024**	24-Nov-2024	✓	**07-Jun-2024**	24-Nov-2024	✓
EP231B: Perfluoroalkyl Carboxylic Acids							
HDPE (no PTFE) (EP231X)							
0089_MW139_240528, 0089_QC108_240528, 0089_MW142_240528, 0089_MW147_240528, 0089_MW149_240528	**28-May-2024**	**05-Jun-2024**	24-Nov-2024	✓	**06-Jun-2024**	24-Nov-2024	✓
HDPE (no PTFE) (EP231X)							
0089_MW141_240528	**28-May-2024**	**06-Jun-2024**	24-Nov-2024	✓	**07-Jun-2024**	24-Nov-2024	✓
EP231C: Perfluoroalkyl Sulfonamides							
HDPE (no PTFE) (EP231X)							
0089_MW139_240528, 0089_QC108_240528, 0089_MW142_240528, 0089_MW147_240528, 0089_MW149_240528	**28-May-2024**	**05-Jun-2024**	24-Nov-2024	✓	**06-Jun-2024**	24-Nov-2024	✓
HDPE (no PTFE) (EP231X)							
0089_MW141_240528	**28-May-2024**	**06-Jun-2024**	24-Nov-2024	✓	**07-Jun-2024**	24-Nov-2024	✓
EP231D: (n:2) Fluorotelomer Sulfonic Acids							
HDPE (no PTFE) (EP231X)							
0089_MW139_240528, 0089_QC108_240528, 0089_MW142_240528, 0089_MW147_240528, 0089_MW149_240528	**28-May-2024**	**05-Jun-2024**	24-Nov-2024	✓	**06-Jun-2024**	24-Nov-2024	✓
HDPE (no PTFE) (EP231X)							
0089_MW141_240528	**28-May-2024**	**06-Jun-2024**	24-Nov-2024	✓	**07-Jun-2024**	24-Nov-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) 0089_MW139_240528, 0089_QC108_240528, 0089_MW142_240528, 0089_MW147_240528, 0089_MW149_240528	**28-May-2024**	**05-Jun-2024**	24-Nov-2024	✓	**06-Jun-2024**	24-Nov-2024	✓
HDPE (no PTFE) (EP231X) 0089_MW141_240528	**28-May-2024**	**06-Jun-2024**	24-Nov-2024	✓	**07-Jun-2024**	24-Nov-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)							
Alkalinity by Auto Titrator	ED037-P	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	35	**5.71**	**10.00**	×	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Alkalinity by Auto Titrator	ED037-P	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	35	**5.71**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Alkalinity by Auto Titrator	ED037-P	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	35	**5.71**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Chloride by Discrete Analyser	ED045G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	35	**5.71**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	20	**5.00**	**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
Alkalinity by Auto Titrator	ED037-P	WATER	In house: Referenced to APHA 2320 B This procedure determines alkalinity by automated measurement (e.g. PC Titrate) on a settled supernatant aliquot of the sample using pH 4.5 for indicating the total alkalinity end-point. This method is compliant with NEPM Schedule B(3)
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	WATER	In house: Referenced to APHA 4500-SO4. Dissolved sulfate is determined in a 0.45um filtered sample. Sulfate ions are converted to a barium sulfate suspension in an acetic acid medium with barium chloride. Light absorbance of the BaSO4 suspension is measured by a photometer and the SO4-2 concentration is determined by comparison of the reading with a standard curve. This method is compliant with NEPM Schedule B(3)
Chloride by Discrete Analyser	ED045G	WATER	In house: Referenced to APHA 4500 Cl - G.The thiocyanate ion is liberated from mercuric thiocyanate through sequestration of mercury by the chloride ion to form non-ionised mercuric chloride. In the presence of ferric ions the liberated thiocynate forms highly-coloured ferric thiocynate which is measured at 480 nm.
Major Cations - Dissolved	ED093F	WATER	In house: Referenced to APHA 3120 and 3125; USEPA SW 846 - 6010 and 6020; Cations are determined by either ICP-AES or ICP-MS techniques. This method is compliant with NEPM Schedule B(3) Sodium Adsorption Ratio is calculated from Ca, Mg and Na which determined by ALS in house method QWI-EN/ED093F. This method is compliant with NEPM Schedule B(3) Hardness parameters are calculated based on APHA 2340 B. This method is compliant with NEPM Schedule B(3)
Ionic Balance by PCT DA and Turbi SO4 DA	* EN055 - PG	WATER	In house: Referenced to APHA 1030F. This method is compliant with NEPM Schedule B(3)
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.

ALSCompass
SAMPLING *Intelligence*

ALS

Environmental Division
Perth
Work Order Reference
EP2407336

Telephone : +61-8-9406 1301

Custody Document for Submissions via ALS Compass App

Project: WA-0089-PFASOTP_24 Client: STANTEC

Project Manager: [redacted]

Phone: ( )

ALS Compass COC Reference: 68276 # Samples: 68293 68221 68274 68275 68271 68266 68272 68267

Sampler: [redacted]

Phone: ( )

Turnaround Requirements: Standard ____ Urgent ____

Special Instructions:

Custody:

Relinquished by:	Received by:	Relinquished by:	Received by:
STANTEC	[redacted]		
Date / Time: 28/5/24 4 pm	Date / Time: 29/5 1230	Date / Time:	Date / Time:

CHAIN OF CUSTODY

COC#: 68272 *ALS Laboratory:* EP Perth Environmental

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

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP_24

SITE: Stirling SD - CG

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]derp.labreports@esdat.com.au

EMAIL INVOICES 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 Sediments SEDIMENT	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
001	0089_SD329		28/05/2024 11:52 AM	SOIL	ALS: 1 Non ALS: 0	No	X		
002	0089_SD330		28/05/2024 11:52 AM	SOIL	ALS: 1 Non ALS: 0	No	X		
003	0089_SD358		28/05/2024 11:53 AM	SOIL	ALS: 1 Non ALS: 0	No	X		
004	0089_SD357		28/05/2024 11:53 AM	SOIL	ALS: 1 Non ALS: 0	No	X		
005	0089_SD331		28/05/2024 11:53 AM	SOIL	ALS: 1 Non ALS: 0	No	X		
006	0089_SD356		28/05/2024 11:54 AM	SOIL	ALS: 1 Non ALS: 0	No	X		

Tuesday, May 28, 2024 8:19:15 AM

CHAIN OF CUSTODY

COC#: 68272 *ALS Laboratory:* EP Perth Environmental

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

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP_24

SITE: Stirling SD - CG

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted] derp.labreports@esdat.com.au

EMAIL INVOICES 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	0089_SD329	HDPE Soil Jar	200 mL	00621122049043	Grey	No	
002	0089_SD330	HDPE Soil Jar	200 mL	00621122049115	Grey	No	
003	0089_SD358	HDPE Soil Jar	200 mL	00621122049042	Grey	No	
004	0089_SD357	HDPE Soil Jar	200 mL	00621122049110	Grey	No	
005	0089_SD331	HDPE Soil Jar	200 mL	00621122049154	Grey	No	
006	0089_SD356	HDPE Soil Jar	200 mL	00621122049157	Grey	No	

Total Bottle Count: ALS: 6, Non ALS: 0

SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : **EP2407336**

Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: [redacted]
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
E-mail	: [redacted]stantec.com	E-mail	: [redacted]alsglobal.com
Telephone	: ----	Telephone	: +61-8-9406 1301
Facsimile	: ----	Facsimile	: +61-8-9406 1399
Project	: WA_0089_PFASOMP_24	Page	: 1 of 2
Order number	: pfas-omp/Stirling	Quote number	: ES2022MWHAUS0002 (SY/139/19 B)
C-O-C number	: 68272	QC Level	: NEPM 2013 B3 & ALS QC Standard
Site	: Stirling SD - CG		
Sampler	: [redacted]		

Dates

Date Samples Received	: 29-May-2024 12:30	Issue Date	: 30-May-2024
Client Requested Due Date	: 10-Jun-2024	Scheduled Reporting Date	: **10-Jun-2024**

Delivery Details

Mode of Delivery	: Carrier	Security Seal	: Not Available
No. of coolers/boxes	: 2	Temperature	: 14.1 - Ice present
Receipt Detail	:	No. of samples received / analysed	: 6 / 6

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 see scanned COC for sample discrepencies: extra samples , samples not received etc.
- Please direct any queries related to sample condition / numbering / breakages to Sample Receipt (Samples.Perth@alsglobal.com)
- Analytical work for this work order will be conducted at ALS Environmental Perth.
- Please direct any turnaround / technical queries to the laboratory contact designated above.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months) from receipt of samples.
- **pH analysis should be conducted within 6 hours of sampling.**
- **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.**
- 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: **SOIL**

Laboratory sample ID	Sampling date / time	Sample ID	SOIL - EA055-103 Moisture Content	SOIL - EP231X (solids) PFAS - Full Suite (30 analytes)
EP2407336-001	28-May-2024 11:52	0089_SD329_240528	✓	✓
EP2407336-002	28-May-2024 11:52	0089_SD330_240528	✓	✓
EP2407336-003	28-May-2024 11:53	0089_SD358_240528	✓	✓
EP2407336-004	28-May-2024 11:53	0089_SD357_240528	✓	✓
EP2407336-005	28-May-2024 11:53	0089_SD331_240528	✓	✓
EP2407336-006	28-May-2024 11:54	0089_SD356_240528	✓	✓

Proactive Holding Time Report

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

Requested Deliverables

[redacted]
- A4 - AU Tax Invoice (INV) — Email — [redacted]cardno.com.au

DERP LAB REPORTS
- EDI Format - ESDAT (ESDAT) — Email — derp.labreports@esdat.com.au

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

CERTIFICATE OF ANALYSIS

Work Order	: **EP2407336**	Page	: 1 of 7
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: [redacted]
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: +61-8-9406 1301
Project	: WA_0089_PFASOMP_24	Date Samples Received	: 29-May-2024 12:30
Order number	: pfas-omp/Stirling	Date Analysis Commenced	: 05-Jun-2024
C-O-C number	: 68272	Issue Date	: 10-Jun-2024 13:01
Sampler	: [redacted]		
Site	: Stirling SD - CG		
Quote number	: SY/139/19 B		
No. of samples received	: 6		
No. of samples analysed	: 6		

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]	Laboratory Manager (Perth)	Perth Inorganics, Wangara, WA
[redacted]	Senior Organic Chemist	Perth Organics, Wangara, WA

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.

- 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 USEPA 1633 limits 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: SEDIMENT (Matrix: SOIL)				Sample ID	0089_SD329_240528	0089_SD330_240528	0089_SD358_240528	0089_SD357_240528	0089_SD331_240528
				Sampling date / time	28-May-2024 11:52	28-May-2024 11:52	28-May-2024 11:53	28-May-2024 11:53	28-May-2024 11:53
Compound	CAS Number	LOR	Unit		EP2407336-001	EP2407336-002	EP2407336-003	EP2407336-004	EP2407336-005
					Result	Result	Result	Result	Result
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content	----	0.1	%		**25.5**	**27.8**	**26.4**	**25.9**	**28.3**
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg		<0.001	<0.001	<0.001	<0.001	<0.001
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002

Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)				Sample ID	0089_SD329_240528	0089_SD330_240528	0089_SD358_240528	0089_SD357_240528	0089_SD331_240528
				Sampling date / time	28-May-2024 11:52	28-May-2024 11:52	28-May-2024 11:53	28-May-2024 11:53	28-May-2024 11:53
Compound	CAS Number	LOR	Unit		EP2407336-001	EP2407336-002	EP2407336-003	EP2407336-004	EP2407336-005
					Result	Result	Result	Result	Result
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
EP231P: PFAS Sums									
Sum of PFAS	----	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Sum of PFAS (WA DER List)	----	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.0002	%		**98.5**	**100**	**98.0**	**93.0**	**106**
13C8-PFOA	----	0.0002	%		**106**	**108**	**108**	**102**	**108**

Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)				Sample ID	0089_SD356_240528	----	----	----	----
				Sampling date / time	28-May-2024 11:54	----	----	----	----
Compound	CAS Number	LOR	Unit		EP2407336-006	--------	--------	--------	--------
					Result	----	----	----	----
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content	----	0.1	%		**27.3**	----	----	----	----
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg		<0.0002	----	----	----	----
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg		<0.0002	----	----	----	----
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg		<0.0002	----	----	----	----
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg		<0.0002	----	----	----	----
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg		<0.0002	----	----	----	----
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg		<0.0002	----	----	----	----
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg		<0.001	----	----	----	----
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg		<0.0002	----	----	----	----
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg		<0.0002	----	----	----	----
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg		<0.0002	----	----	----	----
Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg		<0.0002	----	----	----	----
Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg		<0.0002	----	----	----	----
Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg		<0.0002	----	----	----	----
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg		<0.0002	----	----	----	----
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg		<0.0002	----	----	----	----
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg		<0.0002	----	----	----	----
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg		<0.0005	----	----	----	----
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg		<0.0002	----	----	----	----

Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)				Sample ID	0089_SD356_240528	----	----	----	----
				Sampling date / time	28-May-2024 11:54	----	----	----	----
Compound	CAS Number	LOR	Unit		EP2407336-006	--------	--------	--------	--------
					Result	----	----	----	----
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg		<0.0005	----	----	----	----
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg		<0.0005	----	----	----	----
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg		<0.0005	----	----	----	----
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg		<0.0005	----	----	----	----
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg		<0.0002	----	----	----	----
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg		<0.0002	----	----	----	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg		<0.0005	----	----	----	----
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg		<0.0005	----	----	----	----
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg		<0.0005	----	----	----	----
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg		<0.0005	----	----	----	----
EP231P: PFAS Sums									
Sum of PFAS	----	0.0002	mg/kg		<0.0002	----	----	----	----
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg		<0.0002	----	----	----	----
Sum of PFAS (WA DER List)	----	0.0002	mg/kg		<0.0002	----	----	----	----
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.0002	%		**98.0**	----	----	----	----
13C8-PFOA	----	0.0002	%		**102**	----	----	----	----

Surrogate Control Limits

Sub-Matrix: **SEDIMENT**		Recovery Limits (%)	
Compound	*CAS Number*	*Low*	*High*
EP231S: PFAS Surrogate			
13C4-PFOS	----	76	136
13C8-PFOA	----	78	131

QUALITY CONTROL REPORT

Work Order	: **EP2407336**	Page	: 1 of 12
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: [redacted]
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: +61-8-9406 1301
Project	: WA_0089_PFASOMP_24	Date Samples Received	: 29-May-2024
Order number	: pfas-omp/Stirling	Date Analysis Commenced	: 05-Jun-2024
C-O-C number	: 68272	Issue Date	: 10-Jun-2024
Sampler	: [redacted] [redacted]		
Site	: Stirling SD - CG		
Quote number	: SY/139/19 B		
No. of samples received	: 6		
No. of samples analysed	: 6		

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]	Laboratory Manager (Perth)	Perth Inorganics, Wangara, WA
[redacted]	Senior Organic Chemist	Perth Organics, Wangara, WA

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: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
EA055: Moisture Content (Dried @ 105-110°C) (QC Lot: 5836323)									
EP2407336-001	0089_SD329_240528	EA055: Moisture Content	----	0.1	%	25.5	25.3	0.8	0% - 20%
EP2407412-005	Anonymous	EA055: Moisture Content	----	0.1	%	18.6	19.3	3.8	0% - 20%
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 5834296)									
EP2407274-001	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
EP2407314-005	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 5834300)									
EP2407336-004	0089_SD357_240528	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit

Sub-Matrix: **SOIL**

				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: 5834300) - continued									
EP2407412-008	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	0.0021	0.0020	0.0	0% - 50%
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 5834296)									
EP2407274-001	Anonymous	EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	<0.001	0.0	No Limit
EP2407314-005	Anonymous	EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	<0.001	0.0	No Limit
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 5834300)									
EP2407336-004	0089_SD357_240528	EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit

Sub-Matrix: **SOIL**

				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: 5834300) - continued									
EP2407336-004	0089_SD357_240528	EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	<0.001	0.0	No Limit
EP2407412-008	Anonymous	EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	<0.001	0.0	No Limit
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 5834296)									
EP2407274-001	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
EP2407314-005	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit

Sub-Matrix: **SOIL**

				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: 5834296) - continued									
EP2407314-005	Anonymous	EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 5834300)									
EP2407336-004	0089_SD357_240528	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
EP2407412-008	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 5834296)									
EP2407274-001	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit

Sub-Matrix: **SOIL**

				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: 5834296) - continued									
EP2407314-005	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 5834300)									
EP2407336-004	0089_SD357_240528	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
EP2407412-008	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
EP231P: PFAS Sums (QC Lot: 5834296)									
EP2407274-001	Anonymous	EP231X: Sum of PFAS	----	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Sum of PFAS (WA DER List)	----	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
EP2407314-005	Anonymous	EP231X: Sum of PFAS	----	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Sum of PFAS (WA DER List)	----	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
EP231P: PFAS Sums (QC Lot: 5834300)									
EP2407336-004	0089_SD357_240528	EP231X: Sum of PFAS	----	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Sum of PFAS (WA DER List)	----	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
EP2407412-008	Anonymous	EP231X: Sum of PFAS	----	0.0002	mg/kg	0.0021	0.0020	4.9	0% - 50%

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231P: PFAS Sums (QC Lot: 5834300) - continued									
EP2407412-008	Anonymous	EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg	0.0021	0.0020	4.9	0% - 50%
		EP231X: Sum of PFAS (WA DER List)	----	0.0002	mg/kg	0.0021	0.0020	4.9	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: **SOIL**

				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: 5834296)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	0.0011 mg/kg	94.5	72.0	128
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	0.00125 mg/kg	78.8	73.0	123
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	0.00118 mg/kg	89.0	67.0	130
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	0.00119 mg/kg	96.2	70.0	132
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	0.00116 mg/kg	87.9	68.0	136
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	0.0012 mg/kg	95.0	59.0	134
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5834300)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	0.0011 mg/kg	94.1	72.0	128
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	0.00125 mg/kg	76.0	73.0	123
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	0.00118 mg/kg	92.8	67.0	130
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	0.00119 mg/kg	105	70.0	132
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	0.00116 mg/kg	92.7	68.0	136
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	0.0012 mg/kg	93.8	59.0	134
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5834296)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	0.00625 mg/kg	96.2	71.0	135
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	0.00125 mg/kg	95.2	69.0	132
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	0.00125 mg/kg	104	70.0	132
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	0.00125 mg/kg	94.4	71.0	131
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	99.6	69.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	102	72.0	129
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	0.00125 mg/kg	98.4	69.0	133
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	100	64.0	136
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	96.4	69.0	135
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	102	66.0	139
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	0.00125 mg/kg	102	69.0	133
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5834300)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	0.00625 mg/kg	87.9	71.0	135
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	0.00125 mg/kg	98.0	69.0	132
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	0.00125 mg/kg	105	70.0	132
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	0.00125 mg/kg	95.6	71.0	131

Sub-Matrix: **SOIL**

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: 5834300) - continued								
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	99.6	69.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	98.4	72.0	129
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	0.00125 mg/kg	89.6	69.0	133
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	98.0	64.0	136
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	88.8	69.0	135
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	98.4	66.0	139
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	0.00125 mg/kg	104	69.0	133
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5834296)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	0.00125 mg/kg	97.2	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	0.00312 mg/kg	92.0	59.6	143
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	0.00312 mg/kg	102	62.8	140
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	0.00312 mg/kg	92.5	61.5	139
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	0.00312 mg/kg	89.9	61.9	139
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	0.00125 mg/kg	89.6	63.0	144
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	0.00125 mg/kg	109	61.0	139
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5834300)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	0.00125 mg/kg	92.0	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	0.00312 mg/kg	99.5	59.6	143
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	0.00312 mg/kg	88.0	62.8	140
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	0.00312 mg/kg	121	61.5	139
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	0.00312 mg/kg	94.9	61.9	139
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	0.00125 mg/kg	98.4	63.0	144
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	0.00125 mg/kg	98.8	61.0	139
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5834296)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	0.00117 mg/kg	105	62.0	145
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	0.00118 mg/kg	101	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	0.0012 mg/kg	104	65.0	137
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	0.0012 mg/kg	104	54.8	124

Sub-Matrix: **SOIL**

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: 5834300)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	0.00117 mg/kg	106	62.0	145
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	0.00118 mg/kg	107	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	0.0012 mg/kg	99.6	65.0	137
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	0.0012 mg/kg	90.8	54.8	124
EP231P: PFAS Sums (QCLot: 5834296)								
EP231X: Sum of PFAS	----	0.0002	mg/kg	<0.0002	----	----	----	----
EP231X: Sum of PFHxS and PFOS	355-46-4/17 63-23-1	0.0002	mg/kg	<0.0002	----	----	----	----
EP231X: Sum of PFAS (WA DER List)	----	0.0002	mg/kg	<0.0002	----	----	----	----
EP231P: PFAS Sums (QCLot: 5834300)								
EP231X: Sum of PFAS	----	0.0002	mg/kg	<0.0002	----	----	----	----
EP231X: Sum of PFHxS and PFOS	355-46-4/17 63-23-1	0.0002	mg/kg	<0.0002	----	----	----	----
EP231X: Sum of PFAS (WA DER List)	----	0.0002	mg/kg	<0.0002	----	----	----	----

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: **SOIL**

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: 5834296)							
EP2407274-002	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0011 mg/kg	89.5	72.0	128
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.00117 mg/kg	78.6	73.0	123
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.00118 mg/kg	84.2	67.0	130
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.00119 mg/kg	95.4	70.0	132
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.00116 mg/kg	86.5	68.0	136
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0012 mg/kg	98.4	59.0	134
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5834300)							
EP2407336-005	0089_SD331_240528	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0011 mg/kg	96.4	72.0	128
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.00117 mg/kg	83.8	73.0	123
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.00118 mg/kg	92.8	67.0	130
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.00119 mg/kg	106	70.0	132
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.00116 mg/kg	87.8	68.0	136
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0012 mg/kg	91.2	59.0	134
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5834296)							

Sub-Matrix: **SOIL**

				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: 5834296) - continued							
EP2407274-002	Anonymous	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.00625 mg/kg	87.1	71.0	135
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.00125 mg/kg	94.4	69.0	132
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.00125 mg/kg	109	70.0	132
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.00125 mg/kg	91.6	71.0	131
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.00125 mg/kg	106	69.0	133
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.00125 mg/kg	93.5	72.0	129
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.00125 mg/kg	100	69.0	133
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.00125 mg/kg	98.8	64.0	136
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.00125 mg/kg	98.4	69.0	135
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.00125 mg/kg	108	66.0	139
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.00125 mg/kg	104	69.0	133
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5834300)							
EP2407336-005	0089_SD331_240528	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.00625 mg/kg	93.9	71.0	135
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.00125 mg/kg	101	69.0	132
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.00125 mg/kg	109	70.0	132
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.00125 mg/kg	98.4	71.0	131
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.00125 mg/kg	104	69.0	133
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.00125 mg/kg	99.2	72.0	129
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.00125 mg/kg	101	69.0	133
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.00125 mg/kg	103	64.0	136
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.00125 mg/kg	84.4	69.0	135
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.00125 mg/kg	92.8	66.0	139
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.00125 mg/kg	102	69.0	133
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5834296)							
EP2407274-002	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.00125 mg/kg	91.9	48.0	128
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.00312 mg/kg	93.8	60.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.00312 mg/kg	90.9	60.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.00312 mg/kg	115	60.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.00312 mg/kg	90.1	60.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.00125 mg/kg	92.8	63.0	144
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.00125 mg/kg	105	61.0	139
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5834300)							
EP2407336-005	0089_SD331_240528	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.00125 mg/kg	92.8	48.0	128

Sub-Matrix: **SOIL**

				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: 5834300) - continued							
EP2407336-005	0089_SD331_240528	EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.00312 mg/kg	83.5	60.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.00312 mg/kg	84.3	60.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.00312 mg/kg	105	60.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.00312 mg/kg	103	60.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.00125 mg/kg	80.4	63.0	144
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.00125 mg/kg	91.2	61.0	139
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5834296)							
EP2407274-002	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.00117 mg/kg	97.9	62.0	145
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.00118 mg/kg	100	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0012 mg/kg	98.8	65.0	137
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0012 mg/kg	94.6	60.0	130
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5834300)							
EP2407336-005	0089_SD331_240528	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.00117 mg/kg	97.9	62.0	145
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.00118 mg/kg	109	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0012 mg/kg	107	65.0	137
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0012 mg/kg	82.5	60.0	130

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **EP2407336**	Page	: 1 of 5
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Telephone	: +61-8-9406 1301
Project	: WA_0089_PFASOMP_24	Date Samples Received	: 29-May-2024
Site	: Stirling SD - CG	Issue Date	: 10-Jun-2024
Sampler	: [redacted] [redacted]	No. of samples received	: 6
Order number	: pfas-omp/Stirling	No. of samples analysed	: 6

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, where applicable to the methodology, 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: **SOIL**

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
EA055: Moisture Content (Dried @ 105-110°C)							
HDPE Soil Jar (EA055) 0089_SD329_240528, 0089_SD330_240528, 0089_SD358_240528, 0089_SD357_240528, 0089_SD331_240528, 0089_SD356_240528	**28-May-2024**	**----**	----	----	**05-Jun-2024**	11-Jun-2024	✓
EP231A: Perfluoroalkyl Sulfonic Acids							
HDPE Soil Jar (EP231X) 0089_SD357_240528, 0089_SD331_240528, 0089_SD356_240528	**28-May-2024**	**05-Jun-2024**	24-Nov-2024	✓	**05-Jun-2024**	15-Jul-2024	✓
HDPE Soil Jar (EP231X) 0089_SD329_240528, 0089_SD330_240528, 0089_SD358_240528	**28-May-2024**	**06-Jun-2024**	24-Nov-2024	✓	**07-Jun-2024**	16-Jul-2024	✓
EP231B: Perfluoroalkyl Carboxylic Acids							
HDPE Soil Jar (EP231X) 0089_SD357_240528, 0089_SD331_240528, 0089_SD356_240528	**28-May-2024**	**05-Jun-2024**	24-Nov-2024	✓	**05-Jun-2024**	15-Jul-2024	✓
HDPE Soil Jar (EP231X) 0089_SD329_240528, 0089_SD330_240528, 0089_SD358_240528	**28-May-2024**	**06-Jun-2024**	24-Nov-2024	✓	**07-Jun-2024**	16-Jul-2024	✓
EP231C: Perfluoroalkyl Sulfonamides							
HDPE Soil Jar (EP231X) 0089_SD357_240528, 0089_SD331_240528, 0089_SD356_240528	**28-May-2024**	**05-Jun-2024**	24-Nov-2024	✓	**05-Jun-2024**	15-Jul-2024	✓
HDPE Soil Jar (EP231X) 0089_SD329_240528, 0089_SD330_240528, 0089_SD358_240528	**28-May-2024**	**06-Jun-2024**	24-Nov-2024	✓	**07-Jun-2024**	16-Jul-2024	✓
EP231D: (n:2) Fluorotelomer Sulfonic Acids							
HDPE Soil Jar (EP231X) 0089_SD357_240528, 0089_SD331_240528, 0089_SD356_240528	**28-May-2024**	**05-Jun-2024**	24-Nov-2024	✓	**05-Jun-2024**	15-Jul-2024	✓
HDPE Soil Jar (EP231X) 0089_SD329_240528, 0089_SD330_240528, 0089_SD358_240528	**28-May-2024**	**06-Jun-2024**	24-Nov-2024	✓	**07-Jun-2024**	16-Jul-2024	✓

Matrix: **SOIL**

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 Soil Jar (EP231X) 0089_SD357_240528, 0089_SD331_240528, 0089_SD356_240528	**28-May-2024**	**05-Jun-2024**	24-Nov-2024	✓	**05-Jun-2024**	15-Jul-2024	✓
HDPE Soil Jar (EP231X) 0089_SD329_240528, 0089_SD330_240528, 0089_SD358_240528	**28-May-2024**	**06-Jun-2024**	24-Nov-2024	✓	**07-Jun-2024**	16-Jul-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: **SOIL**

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)							
Moisture Content	EA055	2	19	**10.53**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	4	40	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	40	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	40	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	40	**5.00**	**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
Moisture Content	EA055	SOIL	In house: A gravimetric procedure based on weight loss over a 12 hour drying period at 105-110 degrees C. This method is compliant with NEPM Schedule B(3).
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	SOIL	In-house: Analysis of soils by solvent extraction followed by LC-Electrospray-MS-MS, Negative Mode using MRM using internal standard quantitation. Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to a portion of soil which is then extracted with MTBE and an ion pairing reagent. A portion of extract is exchanged into the analytical solvent mixture, combined with an equal volume reagent water and 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
QuECheRS Extraction of Solids	* ORG71	SOIL	In house: Sequential extractions with Acetonitrile/Methanol by shaking. Extraction efficiency aided by the addition of salts under acidic conditions. Where relevant, interferences from co-extracted organics are removed with dispersive clean-up media (dSPE). The extract is either diluted or concentrated and exchanged into the analytical solvent.

ALSCompass
SAMPLING *Intelligence*

ALS

Perth
Work Order Reference
EP2407337

Telephone : +61-8-9406 1301

Custody Document for Submissions via ALS Compass App

Project: WA-0089-PFASONP_24 Client: STANTEC Project Manager: [redacted]

Phone: ( )

ALS Compass COC Reference: 68243 68221 68274 68275 68271 68276 # Samples: 68266 68272 68267 Sampler: [redacted]

Phone: ( )

Turnaround Requirements: (Standard) Urgent

Special Instructions:

Custody:

Relinquished by: STANTEC	Received by: [redacted]	Relinquished by:	Received by:
Date / Time: 28/5/24 4 pm	Date / Time: 29/5 1230	Date / Time:	Date / Time:

CHAIN OF CUSTODY

COC#: 68274 ALS Laboratory: EP Perth Environmental

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

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP_24

SITE: Stirling SW/PW - CG

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]s

PRIMARY SAMPLER: [redacted]s

CONTACT PH: [redacted]

QUOTE NO: SY/139/19 B

SAMPLER MOBILE: [redacted] / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]derp.labreports@esdat.com.au

EMAIL INVOICES 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	WA OMP Water Suite WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
001	0089_SW156		28/05/2024 10:18 AM	WATER	ALS: 3 Non ALS: 0	No	X		
002	0089_SW154		28/05/2024 10:18 AM	WATER	ALS: 3 Non ALS: 0	No	X		
003	0089_SW152		28/05/2024 10:19 AM	WATER	ALS: 3 Non ALS: 0	No	X		
004	0089_SW150		28/05/2024 10:20 AM	WATER	ALS: 3 Non ALS: 0	No	X		
005	0089_PW329		28/05/2024 10:23 AM	WATER	ALS: 3 Non ALS: 0	No	X		
006	0089_PW358		28/05/2024 10:23 AM	WATER	ALS: 3 Non ALS: 0	No	X		
007	0089_PW357		28/05/2024 10:24 AM	WATER	ALS: 3 Non ALS: 0	No	X		

CHAIN OF CUSTODY

COC#: 68274 ALS Laboratory: EP Perth Environmental

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

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP_24

SITE: Stirling SW/PW - CG

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted]

QUOTE NO: SY/139/19 B

SAMPLER MOBILE: [redacted] / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]erp.labreports@esdat.com.au

EMAIL INVOICES 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	WA OMP Water Suite WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
008	0089_PW330		28/05/2024 10:25 AM	WATER	ALS: 3 Non ALS: 0	No	X		
009	0089_PW356		28/05/2024 10:26 AM	WATER	ALS: 3 Non ALS: 0	No	X		
010	0089_PW331		28/05/2024 10:27 AM	WATER	ALS: 3 Non ALS: 0	No	X		
011	0089_QC112		28/05/2024 10:31 AM	WATER	ALS: 3 Non ALS: 0	No	X		
012	0089_QC113		28/05/2024 10:32 AM	WATER	ALS: 3 Non ALS: 0	No	X		
013	0089_QC114		28/05/2024 11:12 AM	WATER	ALS: 3 Non ALS: 0	No	X		
014	0089_QC115		28/05/2024 11:16 AM	WATER	ALS: 3 Non ALS: 0	No	X		

CHAIN OF CUSTODY

COC#: 68274 ALS Laboratory: EP Perth Environmental

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

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP_24

SITE: Stirling SW/PW - CG

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted] CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

PRIMARY SAMPLER: [redacted] QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted] derp.labreports@esdat.com.au

EMAIL INVOICES 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	0089_SW156	Clear Plastic Bottle - Natural	125 mL	00071121178072	Green	No	
001	0089_SW156	HDPE (no PTFE)	20 mL	00352312048659	Grey	No	
001	0089_SW156	HDPE (no PTFE)	20 mL	00351221024868	Grey	No	
002	0089_SW154	Clear Plastic Bottle - Natural	125 mL	00071121177935	Green	No	
002	0089_SW154	HDPE (no PTFE)	20 mL	00351221024763	Grey	No	
002	0089_SW154	HDPE (no PTFE)	20 mL	00352312048686	Grey	No	
003	0089_SW152	Clear Plastic Bottle - Natural	125 mL	00071121178079	Green	No	
003	0089_SW152	HDPE (no PTFE)	20 mL	00352312048477	Grey	No	
003	0089_SW152	HDPE (no PTFE)	20 mL	00351221024665	Grey	No	
004	0089_SW150	HDPE (no PTFE)	20 mL	00352312048665	Grey	No	
004	0089_SW150	HDPE (no PTFE)	20 mL	00352312048485	Grey	No	
004	0089_SW150	Clear Plastic Bottle - Natural	125 mL	00070821217744	Green	No	
005	0089_PW329	HDPE (no PTFE)	20 mL	00351221024776	Grey	No	
005	0089_PW329	HDPE (no PTFE)	20 mL	00351221024631	Grey	No	
005	0089_PW329	Clear Plastic Bottle - Natural	125 mL	00071121178013	Green	No	
006	0089_PW358	Clear Plastic Bottle - Natural	125 mL	00071121178031	Green	No	
006	0089_PW358	HDPE (no PTFE)	20 mL	00351221024857	Grey	No	
006	0089_PW358	HDPE (no PTFE)	20 mL	00351221024843	Grey	No	
007	0089_PW357	HDPE (no PTFE)	20 mL	00351221026976	Grey	No	
007	0089_PW357	HDPE (no PTFE)	20 mL	00351221027059	Grey	No	
007	0089_PW357	Clear Plastic Bottle - Natural	125 mL	00071121177976	Green	No	
008	0089_PW330	Clear Plastic Bottle - Natural	125 mL	00071121178087	Green	No	
008	0089_PW330	HDPE (no PTFE)	20 mL	00352312048713	Grey	No	
008	0089_PW330	HDPE (no PTFE)	20 mL	00351221024792	Grey	No	
009	0089_PW356	HDPE (no PTFE)	20 mL	00352312048711	Grey	No	
009	0089_PW356	HDPE (no PTFE)	20 mL	00352312048718	Grey	No	

CHAIN OF CUSTODY

COC#: 68274 ALS Laboratory: EP Perth Environmental

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

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP_24

SITE: Stirling SW/PW - CG

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted] SAMPLER MOBILE [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]derp.labreports@esdat.com.au

EMAIL INVOICES 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:

009	0089_PW356	Clear Plastic Bottle - Natural	125 mL	00071121178043	Green	No	
010	0089_PW331	HDPE (no PTFE)	20 mL	00351221027277	Grey	No	
010	0089_PW331	HDPE (no PTFE)	20 mL	00351221027280	Grey	No	
010	0089_PW331	Clear Plastic Bottle - Natural	125 mL	00071121178011	Green	No	
011	0089_QC112	HDPE (no PTFE)	20 mL	00352312048589	Grey	No	
011	0089_QC112	HDPE (no PTFE)	20 mL	00351221024625	Grey	No	
011	0089_QC112	Clear Plastic Bottle - Natural	125 mL	00070821217760	Green	No	
012	0089_QC113	HDPE (no PTFE)	20 mL	00351221024824	Grey	No	
012	0089_QC113	HDPE (no PTFE)	20 mL	00351221024779	Grey	No	
012	0089_QC113	Clear Plastic Bottle - Natural	125 mL	00070821217793	Green	No	
013	0089_QC114	Clear Plastic Bottle - Natural	125 mL	00071121177969	Green	No	
013	0089_QC114	HDPE (no PTFE)	20 mL	00352312048721	Grey	No	
013	0089_QC114	HDPE (no PTFE)	20 mL	00351221024862	Grey	No	
014	0089_QC115	HDPE (no PTFE)	20 mL	00352312048536	Grey	No	
014	0089_QC115	HDPE (no PTFE)	20 mL	00352312048591	Grey	No	
014	0089_QC115	Clear Plastic Bottle - Natural	125 mL	00070821217669	Green	No	

Total Bottle Count: ALS: 42, Non ALS: 0

SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : **EP2407337**

Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: [redacted]
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
E-mail	: [redacted]stantec.com	E-mail	: [redacted]alsglobal.com
Telephone	: ----	Telephone	: +61-8-9406 1301
Facsimile	: ----	Facsimile	: +61-8-9406 1399
Project	: WA_0089_PFASOMP_24	Page	: 1 of 2
Order number	: pfas-omp/Stirling	Quote number	: ES2022MWHAUS0002 (SY/139/19 B)
C-O-C number	: 68274	QC Level	: NEPM 2013 B3 & ALS QC Standard
Site	: Stirling SW/PW - CG		
Sampler	: [redacted]		

Dates

Date Samples Received	: 29-May-2024 12:30	Issue Date	: 30-May-2024
Client Requested Due Date	: 10-Jun-2024	Scheduled Reporting Date	: **10-Jun-2024**

Delivery Details

Mode of Delivery	: Carrier	Security Seal	: Not Available
No. of coolers/boxes	: 2	Temperature	: 14.1 - Ice present
Receipt Detail	:	No. of samples received / analysed	: 14 / 14

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 see scanned COC for sample discrepencies: extra samples , samples not received etc.
- Please direct any queries related to sample condition / numbering / breakages to Sample Receipt (Samples.Perth@alsglobal.com)
- Analytical work for this work order will be conducted at ALS Environmental Perth.
- Please direct any turnaround / technical queries to the laboratory contact designated above.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months) from receipt of samples.
- **pH analysis should be conducted within 6 hours of sampling.**
- **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.**
- 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 (30 analytes)	WATER - NT-01 & 02 Ca, Mg, Na, K, Cl, SO4, Alkalinity
EP2407337-001	28-May-2024 10:18	0089_SW156_240528	✓	✓
EP2407337-002	28-May-2024 10:18	0089_SW154_240528	✓	✓
EP2407337-003	28-May-2024 10:19	0089_SW152_240528	✓	✓
EP2407337-004	28-May-2024 10:20	0089_SW150_240528	✓	✓
EP2407337-005	28-May-2024 10:23	0089_PW329_240528	✓	✓
EP2407337-006	28-May-2024 10:23	0089_PW358_240528	✓	✓
EP2407337-007	28-May-2024 10:24	0089_PW357_240528	✓	✓
EP2407337-008	28-May-2024 10:25	0089_PW330_240528	✓	✓
EP2407337-009	28-May-2024 10:26	0089_PW356_240528	✓	✓
EP2407337-010	28-May-2024 10:27	0089_PW331_240528	✓	✓
EP2407337-011	28-May-2024 10:31	0089_QC112_240528	✓	✓
EP2407337-012	28-May-2024 10:32	0089_QC113_240528	✓	✓
EP2407337-013	28-May-2024 11:12	0089_QC114_240528	✓	✓
EP2407337-014	28-May-2024 11:16	0089_QC115_240528	✓	✓

Proactive Holding Time Report

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

Requested Deliverables

[redacted]
- A4 - AU Tax Invoice (INV) — Email — [redacted]cardno.com.au

DERP LAB REPORTS
- EDI Format - ESDAT (ESDAT) — Email — derp.labreports@esdat.com.au

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

CERTIFICATE OF ANALYSIS

Work Order	: **EP2407337**	Page	: 1 of 15
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: [redacted]
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: +61-8-9406 1301
Project	: WA_0089_PFASOMP_24	Date Samples Received	: 29-May-2024 12:30
Order number	: pfas-omp/Stirling	Date Analysis Commenced	: 31-May-2024
C-O-C number	: 68274	Issue Date	: 10-Jun-2024 21:10
Sampler	: [redacted] [redacted]		
Site	: Stirling SW/PW - CG		
Quote number	: SY/139/19 B		
No. of samples received	: 14		
No. of samples analysed	: 14		

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]	Inorganics Supervisor	Perth Inorganics, Wangara, WA
[redacted]	Laboratory Manager (Perth)	Perth Inorganics, Wangara, WA
[redacted]	Metals Chemist	Perth Inorganics, Wangara, WA
[redacted]	Senior Organic Chemist	Perth Organics, Wangara, WA

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.
- As per QWI – EN55-3 Data Interpreting Procedures, Ionic balances are typically calculated using Major Anions - Chloride, Alkalinity and Sulfate; and Major Cations - Calcium, Magnesium, Potassium and Sodium. Where applicable and dependent upon sample matrix, the Ionic Balance may also include the additional contribution of Ammonia, Dissolved Metals by ICPMS and H+ to the Cations and Nitrate, SiO2 and Fluoride to the Anions.
- Sodium Adsorption Ratio (where reported): Where results for Na, Ca or Mg are <LOR, a concentration at half the reported LOR is incorporated into the SAR calculation. This represents a conservative approach for Na relative to the assumption that <LOR = zero concentration and a conservative approach for Ca & Mg relative to the assumption that <LOR is equivalent to the LOR concentration.
- 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.
- ED045G: The presence of Thiocyanate, Thiosulfate and Sulfite can positively contribute to the chloride result, thereby may bias results higher than expected. Results should be scrutinised accordingly.

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_QC114_240528	0089_QC115_240528	----	----	----
				Sampling date / time	28-May-2024 11:12	28-May-2024 11:16	----	----	----
Compound	CAS Number	LOR	Unit		EP2407337-013	EP2407337-014	--------	--------	--------
					Result	Result	----	----	----
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	<1	----	----	----
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	<1	----	----	----
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		**140**	**175**	----	----	----
Total Alkalinity as CaCO3	----	1	mg/L		**140**	**175**	----	----	----
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		**2490**	**2470**	----	----	----
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		**15300**	**16400**	----	----	----
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		**422**	**464**	----	----	----
Magnesium	7439-95-4	1	mg/L		**1280**	**1390**	----	----	----
Sodium	7440-23-5	1	mg/L		**9700**	**10400**	----	----	----
Potassium	7440-09-7	1	mg/L		**548**	**587**	----	----	----
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		**486**	**518**	----	----	----
ø Total Cations	----	0.01	meq/L		**562**	**605**	----	----	----
ø Ionic Balance	----	0.01	%		**7.26**	**7.78**	----	----	----
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		<0.01	<0.01	----	----	----
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		**0.02**	<0.01	----	----	----
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	<0.02	----	----	----

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_QC114_240528	0089_QC115_240528	----	----	----
				Sampling date / time	28-May-2024 11:12	28-May-2024 11:16	----	----	----
Compound	CAS Number	LOR	Unit		EP2407337-013	EP2407337-014	--------	--------	--------
					Result	Result	----	----	----
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		<0.1	<0.1	----	----	----
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		<0.01	<0.01	----	----	----
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		<0.05	<0.05	----	----	----
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L		<0.02	<0.02	----	----	----
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L		<0.05	<0.05	----	----	----
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L		<0.05	<0.05	----	----	----
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L		<0.05	<0.05	----	----	----
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L		<0.05	<0.05	----	----	----
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L		<0.02	<0.02	----	----	----
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L		<0.02	<0.02	----	----	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids									

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_QC114_240528	0089_QC115_240528	----	----	----
				Sampling date / time	28-May-2024 11:12	28-May-2024 11:16	----	----	----
Compound	CAS Number	LOR	Unit		EP2407337-013	EP2407337-014	--------	--------	--------
					Result	Result	----	----	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L		<0.05	<0.05	----	----	----
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		<0.05	<0.05	----	----	----
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		<0.05	<0.05	----	----	----
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L		<0.05	<0.05	----	----	----
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L		**0.02**	<0.01	----	----	----
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		**0.02**	<0.01	----	----	----
Sum of PFAS (WA DER List)	----	0.01	µg/L		**0.02**	<0.01	----	----	----
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**101**	**97.5**	----	----	----
13C8-PFOA	----	0.02	%		**88.7**	**91.3**	----	----	----

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_SW156_240528	0089_SW154_240528	0089_SW152_240528	0089_SW150_240528	0089_PW329_240528
				Sampling date / time	28-May-2024 10:18	28-May-2024 10:18	28-May-2024 10:19	28-May-2024 10:20	28-May-2024 10:23
Compound	CAS Number	LOR	Unit		EP2407337-001	EP2407337-002	EP2407337-003	EP2407337-004	EP2407337-005
					Result	Result	Result	Result	Result
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	<1	<1	<1	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	<1	<1	<1	<1
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		120	120	120	131	228
Total Alkalinity as CaCO3	----	1	mg/L		120	120	120	131	228
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		2480	2740	2650	2490	2470
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		17000	16000	16800	17400	15900
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		440	442	444	444	446
Magnesium	7439-95-4	1	mg/L		1420	1420	1420	1380	1350
Sodium	7440-23-5	1	mg/L		10300	10300	10400	10400	9840
Potassium	7440-09-7	1	mg/L		574	574	575	589	542
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		534	511	531	545	504
ø Total Cations	----	0.01	meq/L		602	602	606	603	575
ø Ionic Balance	----	0.01	%		5.99	8.17	6.56	5.04	6.55
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

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_SW156_240528	0089_SW154_240528	0089_SW152_240528	0089_SW150_240528	0089_PW329_240528
				Sampling date / time	28-May-2024 10:18	28-May-2024 10:18	28-May-2024 10:19	28-May-2024 10:20	28-May-2024 10:23
Compound	CAS Number	LOR	Unit		EP2407337-001	EP2407337-002	EP2407337-003	EP2407337-004	EP2407337-005
					Result	Result	Result	Result	Result
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
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									

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_SW156_240528	0089_SW154_240528	0089_SW152_240528	0089_SW150_240528	0089_PW329_240528
				Sampling date / time	28-May-2024 10:18	28-May-2024 10:18	28-May-2024 10:19	28-May-2024 10:20	28-May-2024 10:23
Compound	CAS Number	LOR	Unit		EP2407337-001	EP2407337-002	EP2407337-003	EP2407337-004	EP2407337-005
					Result	Result	Result	Result	Result
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
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	%		**107**	**98.2**	**104**	**105**	**98.9**
13C8-PFOA	----	0.02	%		**92.7**	**89.6**	**90.9**	**89.5**	**98.7**

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_PW358_240528	0089_PW357_240528	0089_PW330_240528	0089_PW356_240528	0089_PW331_240528
				Sampling date / time	28-May-2024 10:23	28-May-2024 10:24	28-May-2024 10:25	28-May-2024 10:26	28-May-2024 10:27
Compound	CAS Number	LOR	Unit		EP2407337-006	EP2407337-007	EP2407337-008	EP2407337-009	EP2407337-010
					Result	Result	Result	Result	Result
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	<1	<1	<1	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	<1	<1	<1	<1
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		121	122	124	150	124
Total Alkalinity as CaCO3	----	1	mg/L		121	122	124	150	124
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		2600	2560	2520	2450	2550
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		16700	16100	17500	15900	16800
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		447	433	446	438	442
Magnesium	7439-95-4	1	mg/L		1440	1390	1390	1370	1420
Sodium	7440-23-5	1	mg/L		10500	10200	10500	9970	10300
Potassium	7440-09-7	1	mg/L		581	558	590	557	575
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		528	510	548	502	529
ø Total Cations	----	0.01	meq/L		612	594	608	582	602
ø Ionic Balance	----	0.01	%		7.44	7.61	5.17	7.37	6.38
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	0.02	<0.01
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_PW358_240528	0089_PW357_240528	0089_PW330_240528	0089_PW356_240528	0089_PW331_240528
				Sampling date / time	28-May-2024 10:23	28-May-2024 10:24	28-May-2024 10:25	28-May-2024 10:26	28-May-2024 10:27
Compound	CAS Number	LOR	Unit		EP2407337-006	EP2407337-007	EP2407337-008	EP2407337-009	EP2407337-010
					Result	Result	Result	Result	Result
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
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									

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_PW358_240528	0089_PW357_240528	0089_PW330_240528	0089_PW356_240528	0089_PW331_240528
				Sampling date / time	28-May-2024 10:23	28-May-2024 10:24	28-May-2024 10:25	28-May-2024 10:26	28-May-2024 10:27
Compound	CAS Number	LOR	Unit		EP2407337-006	EP2407337-007	EP2407337-008	EP2407337-009	EP2407337-010
					Result	Result	Result	Result	Result
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
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	**0.02**	<0.01
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		<0.01	<0.01	<0.01	**0.02**	<0.01
Sum of PFAS (WA DER List)	----	0.01	µg/L		<0.01	<0.01	<0.01	**0.02**	<0.01
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**99.7**	**103**	**98.1**	**99.4**	**99.8**
13C8-PFOA	----	0.02	%		**86.7**	**97.1**	**86.2**	**94.8**	**90.0**

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_QC112_240528	0089_QC113_240528	----	----	----
				Sampling date / time	28-May-2024 10:31	28-May-2024 10:32	----	----	----
Compound	CAS Number	LOR	Unit		EP2407337-011	EP2407337-012	--------	--------	--------
					Result	Result	----	----	----
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	<1	----	----	----
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	<1	----	----	----
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		120	120	----	----	----
Total Alkalinity as CaCO3	----	1	mg/L		120	120	----	----	----
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		2560	2650	----	----	----
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		17000	16000	----	----	----
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		447	447	----	----	----
Magnesium	7439-95-4	1	mg/L		1430	1430	----	----	----
Sodium	7440-23-5	1	mg/L		10400	10400	----	----	----
Potassium	7440-09-7	1	mg/L		578	578	----	----	----
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		535	509	----	----	----
ø Total Cations	----	0.01	meq/L		607	607	----	----	----
ø Ionic Balance	----	0.01	%		6.29	8.80	----	----	----
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		<0.01	<0.01	----	----	----
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		<0.01	<0.01	----	----	----
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	<0.02	----	----	----

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_QC112_240528	0089_QC113_240528	----	----	----
				Sampling date / time	28-May-2024 10:31	28-May-2024 10:32	----	----	----
Compound	CAS Number	LOR	Unit		EP2407337-011	EP2407337-012	--------	--------	--------
					Result	Result	----	----	----
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		<0.1	<0.1	----	----	----
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		<0.01	<0.01	----	----	----
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		<0.05	<0.05	----	----	----
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L		<0.02	<0.02	----	----	----
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L		<0.05	<0.05	----	----	----
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L		<0.05	<0.05	----	----	----
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L		<0.05	<0.05	----	----	----
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L		<0.05	<0.05	----	----	----
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L		<0.02	<0.02	----	----	----
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L		<0.02	<0.02	----	----	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids									

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_QC112_240528	0089_QC113_240528	----	----	----
				Sampling date / time	28-May-2024 10:31	28-May-2024 10:32	----	----	----
Compound	CAS Number	LOR	Unit		EP2407337-011	EP2407337-012	--------	--------	--------
					Result	Result	----	----	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L		<0.05	<0.05	----	----	----
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		<0.05	<0.05	----	----	----
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		<0.05	<0.05	----	----	----
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L		<0.05	<0.05	----	----	----
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L		<0.01	<0.01	----	----	----
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		<0.01	<0.01	----	----	----
Sum of PFAS (WA DER List)	----	0.01	µg/L		<0.01	<0.01	----	----	----
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**96.5**	**99.3**	----	----	----
13C8-PFOA	----	0.02	%		**91.3**	**92.7**	----	----	----

Surrogate Control Limits

Sub-Matrix: GROUNDWATER		Recovery Limits (%)	
Compound	CAS Number	Low	High
EP231S: PFAS Surrogate			
13C4-PFOS	----	65	140
13C8-PFOA	----	71	133

Sub-Matrix: SURFACE WATER		Recovery Limits (%)	
Compound	CAS Number	Low	High
EP231S: PFAS Surrogate			
13C4-PFOS	----	65	140
13C8-PFOA	----	71	133

QUALITY CONTROL REPORT

Work Order	: **EP2407337**	Page	: 1 of 12
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: [redacted]
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: +61-8-9406 1301
Project	: WA_0089_PFASOMP_24	Date Samples Received	: 29-May-2024
Order number	: pfas-omp/Stirling	Date Analysis Commenced	: 31-May-2024
C-O-C number	: 68274	Issue Date	: 10-Jun-2024
Sampler	: [redacted] [redacted]		
Site	: Stirling SW/PW - CG		
Quote number	: SY/139/19 B		
No. of samples received	: 14		
No. of samples analysed	: 14		

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]	Inorganics Supervisor	Perth Inorganics, Wangara, WA
[redacted]	Laboratory Manager (Perth)	Perth Inorganics, Wangara, WA
[redacted]	Metals Chemist	Perth Inorganics, Wangara, WA
[redacted]	Senior Organic Chemist	Perth Organics, Wangara, WA

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 (%)
ED037P: Alkalinity by PC Titrator (QC Lot: 5828918)									
EP2407337-002	0089_SW154_240528	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	120	120	0.0	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	120	120	0.0	0% - 20%
EP2407337-012	0089_QC113_240528	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	120	120	0.0	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	120	120	0.0	0% - 20%
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QC Lot: 5827152)									
EP2407337-001	0089_SW156_240528	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	2480	2570	3.4	0% - 20%
EP2407337-011	0089_QC112_240528	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	2560	2490	2.5	0% - 20%
ED045G: Chloride by Discrete Analyser (QC Lot: 5827153)									
EP2407337-001	0089_SW156_240528	ED045G: Chloride	16887-00-6	1	mg/L	17000	15900	6.5	0% - 20%
EP2407337-011	0089_QC112_240528	ED045G: Chloride	16887-00-6	1	mg/L	17000	16700	1.8	0% - 20%
ED093F: Dissolved Major Cations (QC Lot: 5827886)									
EP2407030-023	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	247	245	1.0	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	640	631	1.4	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	4520	4470	1.1	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	254	250	1.4	0% - 20%
EP2407337-004	0089_SW150_240528	ED093F: Calcium	7440-70-2	1	mg/L	444	445	0.0	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	1380	1380	0.0	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	10400	10400	0.8	0% - 20%

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 (%)
ED093F: Dissolved Major Cations (QC Lot: 5827886) - continued									
EP2407337-004	0089_SW150_240528	ED093F: Potassium	7440-09-7	1	mg/L	589	583	0.9	0% - 20%
ED093F: Dissolved Major Cations (QC Lot: 5827901)									
EP2407316-001	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	441	440	0.3	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	1370	1370	0.1	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	10400	10400	0.5	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	581	582	0.0	0% - 20%
EP2407384-005	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	160	164	2.2	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	41	42	0.0	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	239	242	1.0	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	17	17	0.0	0% - 50%
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 5838152)									
EP2407316-001	Anonymous	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: 5838188)									
EP2407306-002	Anonymous	EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	1.59	1.64	3.0	0% - 20%
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	5.61	6.72	18.0	0% - 20%
		EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	0.08	0.08	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	0.03	0.03	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	0.49	0.56	12.9	0% - 20%
		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: 5838152)									
EP2407316-001	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
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 5838188)									

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: 5838188) - continued									
EP2407306-002	Anonymous	EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	0.18	0.18	5.7	0% - 50%
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	0.31	0.32	0.0	0% - 50%
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	0.30	0.30	0.0	0% - 50%
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	0.14	0.13	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	0.03	0.04	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: 5838152)									
EP2407316-001	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
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 5838188)									
EP2407306-002	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

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: 5838152)									
EP2407316-001	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
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 5838188)									
EP2407306-002	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	0.06	0.06	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: 5838152)									
EP2407316-001	Anonymous	EP231X: Sum of PFAS	----	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	<0.01	<0.01	0.0	No Limit
EP231P: PFAS Sums (QC Lot: 5838188)									
EP2407306-002	Anonymous	EP231X: Sum of PFAS	----	0.01	µg/L	8.92	10.2	13.0	0% - 20%
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	7.20	8.36	14.9	0% - 20%
		EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	8.37	9.53	13.0	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
ED037P: Alkalinity by PC Titrator (QCLot: 5828918)								
ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	----	----	----	----
ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	----	----	----	----
ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	<1	----	----	----	----
ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	<1	20 mg/L	94.0	85.1	126
				<1	200 mg/L	98.5	90.5	111
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 5827152)								
ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<1	25 mg/L	103	89.9	112
				<1	500 mg/L	100	89.9	112
ED045G: Chloride by Discrete Analyser (QCLot: 5827153)								
ED045G: Chloride	16887-00-6	1	mg/L	<1	10 mg/L	98.7	88.6	113
				<1	1000 mg/L	102	88.6	113
ED093F: Dissolved Major Cations (QCLot: 5827886)								
ED093F: Calcium	7440-70-2	1	mg/L	<1	50 mg/L	103	86.5	117
ED093F: Magnesium	7439-95-4	1	mg/L	<1	50 mg/L	103	88.4	110
ED093F: Sodium	7440-23-5	1	mg/L	<1	50 mg/L	99.7	91.4	113
ED093F: Potassium	7440-09-7	1	mg/L	<1	50 mg/L	96.9	84.6	108
ED093F: Dissolved Major Cations (QCLot: 5827901)								
ED093F: Calcium	7440-70-2	1	mg/L	<1	50 mg/L	101	86.5	117
ED093F: Magnesium	7439-95-4	1	mg/L	<1	50 mg/L	100	88.4	110
ED093F: Sodium	7440-23-5	1	mg/L	<1	50 mg/L	99.3	91.4	113
ED093F: Potassium	7440-09-7	1	mg/L	<1	50 mg/L	96.3	84.6	108
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5834884)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.2218 µg/L	94.2	72.0	130
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.2352 µg/L	101	71.0	127
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	0.2373 µg/L	96.9	68.0	131
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.238 µg/L	100	69.0	134
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.232 µg/L	83.0	65.0	140
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.241 µg/L	87.6	53.0	142
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5838152)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.2218 µg/L	92.2	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
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5838152) - continued								
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.2352 µg/L	103	71.0	127
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	0.2373 µg/L	98.0	68.0	131
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.238 µg/L	108	69.0	134
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.232 µg/L	87.3	65.0	140
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.241 µg/L	88.2	53.0	142
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5838188)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.2218 µg/L	97.4	72.0	130
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.2352 µg/L	83.5	71.0	127
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	0.2373 µg/L	93.6	68.0	131
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.238 µg/L	105	69.0	134
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.232 µg/L	97.6	65.0	140
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.241 µg/L	101	53.0	142
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5834884)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	1.25 µg/L	99.0	73.0	129
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	0.25 µg/L	96.2	72.0	129
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	0.25 µg/L	114	72.0	129
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	0.25 µg/L	101	72.0	130
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	0.25 µg/L	100	71.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	0.25 µg/L	95.8	69.0	130
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	0.25 µg/L	93.6	71.0	129
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	0.25 µg/L	101	69.0	133
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	0.25 µg/L	95.4	72.0	134
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	0.25 µg/L	112	65.0	144
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	0.25 µg/L	106	71.0	132
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5838152)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	1.25 µg/L	101	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	116	72.0	129
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	0.25 µg/L	96.4	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	108	69.0	130
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	0.25 µg/L	87.8	71.0	129
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	0.25 µg/L	110	69.0	133
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	0.25 µg/L	98.2	72.0	134

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
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5838152) - continued								
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	0.25 µg/L	110	65.0	144
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	0.25 µg/L	102	71.0	132
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5838188)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	1.25 µg/L	97.2	73.0	129
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	0.25 µg/L	104	72.0	129
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	0.25 µg/L	111	72.0	129
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	0.25 µg/L	101	72.0	130
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	0.25 µg/L	96.6	71.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	0.25 µg/L	96.4	69.0	130
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	0.25 µg/L	97.0	71.0	129
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	0.25 µg/L	105	69.0	133
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	0.25 µg/L	102	72.0	134
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	0.25 µg/L	95.2	65.0	144
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	0.25 µg/L	100	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5834884)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.25 µg/L	90.6	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	0.625 µg/L	108	68.0	141
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	0.625 µg/L	102	60.5	138
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	0.625 µg/L	98.2	68.3	134
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	0.625 µg/L	105	62.2	138
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	0.25 µg/L	95.4	65.0	136
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	0.25 µg/L	107	61.0	135
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5838152)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.25 µg/L	90.4	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	0.625 µg/L	111	68.0	141
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	0.625 µg/L	81.0	60.5	138
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	0.625 µg/L	95.8	68.3	134
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	0.625 µg/L	105	62.2	138
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	0.25 µg/L	101	65.0	136

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: 5838152) - continued								
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	0.25 µg/L	81.4	61.0	135
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5838188)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.25 µg/L	96.6	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	0.625 µg/L	97.3	68.0	141
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	0.625 µg/L	102	60.5	138
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	0.625 µg/L	112	68.3	134
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	0.625 µg/L	93.6	62.2	138
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	0.25 µg/L	111	65.0	136
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	0.25 µg/L	99.4	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5834884)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.2343 µg/L	114	63.0	143
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	0.2378 µg/L	104	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	0.24 µg/L	107	67.0	138
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	0.241 µg/L	92.1	64.2	133
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5838152)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.2343 µg/L	108	63.0	143
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	0.2378 µg/L	108	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	0.24 µg/L	126	67.0	138
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	0.241 µg/L	104	64.2	133
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5838188)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.2343 µg/L	111	63.0	143
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	0.2378 µg/L	105	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	0.24 µg/L	115	67.0	138
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	0.241 µg/L	98.5	64.2	133
EP231P: PFAS Sums (QCLot: 5834884)								
EP231X: Sum of PFAS	----	0.01	µg/L	<0.01	----	----	----	----
EP231X: Sum of PFHxS and PFOS	355-46-4/17 63-23-1	0.01	µg/L	<0.01	----	----	----	----
EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	<0.01	----	----	----	----
EP231P: PFAS Sums (QCLot: 5838152)								
EP231X: Sum of PFAS	----	0.01	µg/L	<0.01	----	----	----	----

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	LCS: Spike Recovery (%)	Acceptable Limits (%): Low	Acceptable Limits (%): High
EP231P: PFAS Sums (QCLot: 5838152) - continued								
EP231X: Sum of PFHxS and PFOS	355-46-4/17 63-23-1	0.01	µg/L	<0.01	----	----	----	----
EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	<0.01	----	----	----	----
EP231P: PFAS Sums (QCLot: 5838188)								
EP231X: Sum of PFAS	----	0.01	µg/L	<0.01	----	----	----	----
EP231X: Sum of PFHxS and PFOS	355-46-4/17 63-23-1	0.01	µg/L	<0.01	----	----	----	----
EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	<0.01	----	----	----	----

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
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 5827152)							
EP2407337-001	0089_SW156_240528	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	100 mg/L	# Not Determined	70.4	130
ED045G: Chloride by Discrete Analyser (QCLot: 5827153)							
EP2407337-001	0089_SW156_240528	ED045G: Chloride	16887-00-6	200 mg/L	# Not Determined	70.0	130
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5838152)							
EP2407316-006	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.2218 µg/L	92.1	72.0	129
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.232 µg/L	98.9	71.0	127
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.2352 µg/L	94.8	68.0	129
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.238 µg/L	104	69.0	134
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.232 µg/L	94.0	65.0	140
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.241 µg/L	97.7	53.0	129
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5838188)							
EP2407316-013	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.2218 µg/L	92.2	72.0	129
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.232 µg/L	84.3	71.0	127
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.2352 µg/L	93.4	68.0	129
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.238 µg/L	95.4	69.0	134
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.232 µg/L	99.4	65.0	140
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.241 µg/L	76.6	53.0	129
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5838152)							

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: 5838152) - continued							
EP2407316-006	Anonymous	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	1.25 µg/L	98.1	73.0	142
		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	116	72.0	129
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.25 µg/L	103	72.0	130
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.25 µg/L	115	71.0	133
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.25 µg/L	101	69.0	130
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.25 µg/L	111	71.0	134
		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	104	65.0	144
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.25 µg/L	100	71.0	132
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5838188)							
EP2407316-013	Anonymous	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	1.25 µg/L	111	73.0	142
		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	102	72.0	129
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.25 µg/L	91.9	72.0	130
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.25 µg/L	93.1	71.0	133
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.25 µg/L	93.0	69.0	130
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.25 µg/L	93.6	71.0	134
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.25 µg/L	108	69.0	133
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.25 µg/L	96.6	72.0	134
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.25 µg/L	92.8	65.0	144
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.25 µg/L	100	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5838152)							
EP2407316-006	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.25 µg/L	88.1	59.0	135
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.625 µg/L	103	70.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.625 µg/L	88.2	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.625 µg/L	99.7	70.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.625 µg/L	97.0	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.25 µg/L	97.8	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: 5838188)							
EP2407316-013	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.25 µg/L	97.6	59.0	135

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: 5838188) - continued							
EP2407316-013	Anonymous	EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.625 µg/L	91.6	70.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.625 µg/L	92.6	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.625 µg/L	106	70.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.625 µg/L	102	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.25 µg/L	101	65.0	136
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.25 µg/L	92.4	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5838152)							
EP2407316-006	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.234 µg/L	112	63.0	143
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.2378 µg/L	107	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.24 µg/L	111	67.0	138
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.2415 µg/L	92.5	70.0	130
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5838188)							
EP2407316-013	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.234 µg/L	104	63.0	143
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.2378 µg/L	93.1	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.24 µg/L	109	67.0	138
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.2415 µg/L	74.5	70.0	130

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **EP2407337**	Page	: 1 of 7
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Telephone	: +61-8-9406 1301
Project	: WA_0089_PFASOMP_24	Date Samples Received	: 29-May-2024
Site	: Stirling SW/PW - CG	Issue Date	: 10-Jun-2024
Sampler	: [redacted] [redacted]	No. of samples received	: 14
Order number	: pfas-omp/Stirling	No. of samples analysed	: 14

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.**
- **Matrix Spike outliers exist - please see following pages for full details.**
- **For all regular sample matrices, where applicable to the methodology, 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 : Quality Control Samples

Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

Matrix: **WATER**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
Matrix Spike (MS) Recoveries							
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA	EP2407337--001	0089_SW156_240528	**Sulfate as SO4 - Turbidimetric**	14808-79-8	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
ED045G: Chloride by Discrete Analyser	EP2407337--001	0089_SW156_240528	**Chloride**	16887-00-6	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**

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	2	44	4.55	10.00	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)						
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	44	4.55	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*			*Analysis*		
			Date extracted	*Due for extraction*	*Evaluation*	*Date analysed*	*Due for analysis*	*Evaluation*
ED037P: Alkalinity by PC Titrator								
Clear Plastic Bottle - Natural (ED037-P)								
0089_SW156_240528,	0089_SW154_240528,	**28-May-2024**	**----**	----	**----**	**31-May-2024**	11-Jun-2024	✓
0089_SW152_240528,	0089_SW150_240528,							
0089_PW329_240528,	0089_PW358_240528,							
0089_PW357_240528,	0089_PW330_240528,							
0089_PW356_240528,	0089_PW331_240528,							
0089_QC112_240528,	0089_QC113_240528,							
0089_QC114_240528,	0089_QC115_240528							

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
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA								
Clear Plastic Bottle - Natural (ED041G)								
0089_SW156_240528,	0089_SW154_240528,	**28-May-2024**	**----**	----	----	**08-Jun-2024**	25-Jun-2024	✓
0089_SW152_240528,	0089_SW150_240528,							
0089_PW329_240528,	0089_PW358_240528,							
0089_PW357_240528,	0089_PW330_240528,							
0089_PW356_240528,	0089_PW331_240528,							
0089_QC112_240528,	0089_QC113_240528,							
0089_QC114_240528,	0089_QC115_240528							
ED045G: Chloride by Discrete Analyser								
Clear Plastic Bottle - Natural (ED045G)								
0089_SW156_240528,	0089_SW154_240528,	**28-May-2024**	**----**	----	----	**08-Jun-2024**	25-Jun-2024	✓
0089_SW152_240528,	0089_SW150_240528,							
0089_PW329_240528,	0089_PW358_240528,							
0089_PW357_240528,	0089_PW330_240528,							
0089_PW356_240528,	0089_PW331_240528,							
0089_QC112_240528,	0089_QC113_240528,							
0089_QC114_240528,	0089_QC115_240528							
ED093F: Dissolved Major Cations								
Clear Plastic Bottle - Natural (ED093F)								
0089_QC114_240528,	0089_QC115_240528	**28-May-2024**	**----**	----	----	**04-Jun-2024**	04-Jun-2024	✓
Clear Plastic Bottle - Natural (ED093F)								
0089_SW156_240528,	0089_SW154_240528,	**28-May-2024**	**----**	----	----	**31-May-2024**	04-Jun-2024	✓
0089_SW152_240528,	0089_SW150_240528,							
0089_PW329_240528,	0089_PW358_240528,							
0089_PW357_240528,	0089_PW330_240528,							
0089_PW356_240528,	0089_PW331_240528,							
0089_QC112_240528,	0089_QC113_240528							
EP231A: Perfluoroalkyl Sulfonic Acids								
HDPE (no PTFE) (EP231X)								
0089_SW156_240528,	0089_SW154_240528,	**28-May-2024**	**05-Jun-2024**	24-Nov-2024	✓	**06-Jun-2024**	24-Nov-2024	✓
0089_SW152_240528,	0089_SW150_240528							
HDPE (no PTFE) (EP231X)								
0089_PW358_240528,	0089_PW357_240528,	**28-May-2024**	**06-Jun-2024**	24-Nov-2024	✓	**06-Jun-2024**	24-Nov-2024	✓
0089_PW330_240528,	0089_PW356_240528,							
0089_PW331_240528,	0089_QC112_240528,							
0089_QC113_240528,	0089_QC114_240528,							
0089_QC115_240528								
HDPE (no PTFE) (EP231X)								
0089_PW329_240528		**28-May-2024**	**06-Jun-2024**	24-Nov-2024	✓	**07-Jun-2024**	24-Nov-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) 0089_SW156_240528, 0089_SW154_240528, 0089_SW152_240528, 0089_SW150_240528	**28-May-2024**	**05-Jun-2024**	24-Nov-2024	✓	**06-Jun-2024**	24-Nov-2024	✓
HDPE (no PTFE) (EP231X) 0089_PW358_240528, 0089_PW357_240528, 0089_PW330_240528, 0089_PW356_240528, 0089_PW331_240528, 0089_QC112_240528, 0089_QC113_240528, 0089_QC114_240528, 0089_QC115_240528	**28-May-2024**	**06-Jun-2024**	24-Nov-2024	✓	**06-Jun-2024**	24-Nov-2024	✓
HDPE (no PTFE) (EP231X) 0089_PW329_240528	**28-May-2024**	**06-Jun-2024**	24-Nov-2024	✓	**07-Jun-2024**	24-Nov-2024	✓
EP231C: Perfluoroalkyl Sulfonamides							
HDPE (no PTFE) (EP231X) 0089_SW156_240528, 0089_SW154_240528, 0089_SW152_240528, 0089_SW150_240528	**28-May-2024**	**05-Jun-2024**	24-Nov-2024	✓	**06-Jun-2024**	24-Nov-2024	✓
HDPE (no PTFE) (EP231X) 0089_PW358_240528, 0089_PW357_240528, 0089_PW330_240528, 0089_PW356_240528, 0089_PW331_240528, 0089_QC112_240528, 0089_QC113_240528, 0089_QC114_240528, 0089_QC115_240528	**28-May-2024**	**06-Jun-2024**	24-Nov-2024	✓	**06-Jun-2024**	24-Nov-2024	✓
HDPE (no PTFE) (EP231X) 0089_PW329_240528	**28-May-2024**	**06-Jun-2024**	24-Nov-2024	✓	**07-Jun-2024**	24-Nov-2024	✓
EP231D: (n:2) Fluorotelomer Sulfonic Acids							
HDPE (no PTFE) (EP231X) 0089_SW156_240528, 0089_SW154_240528, 0089_SW152_240528, 0089_SW150_240528	**28-May-2024**	**05-Jun-2024**	24-Nov-2024	✓	**06-Jun-2024**	24-Nov-2024	✓
HDPE (no PTFE) (EP231X) 0089_PW358_240528, 0089_PW357_240528, 0089_PW330_240528, 0089_PW356_240528, 0089_PW331_240528, 0089_QC112_240528, 0089_QC113_240528, 0089_QC114_240528, 0089_QC115_240528	**28-May-2024**	**06-Jun-2024**	24-Nov-2024	✓	**06-Jun-2024**	24-Nov-2024	✓
HDPE (no PTFE) (EP231X) 0089_PW329_240528	**28-May-2024**	**06-Jun-2024**	24-Nov-2024	✓	**07-Jun-2024**	24-Nov-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) 0089_SW156_240528, 0089_SW154_240528, 0089_SW152_240528, 0089_SW150_240528	**28-May-2024**	**05-Jun-2024**	24-Nov-2024	✓	**06-Jun-2024**	24-Nov-2024	✓
HDPE (no PTFE) (EP231X) 0089_PW358_240528, 0089_PW357_240528, 0089_PW330_240528, 0089_PW356_240528, 0089_PW331_240528, 0089_QC112_240528, 0089_QC113_240528, 0089_QC114_240528, 0089_QC115_240528	**28-May-2024**	**06-Jun-2024**	24-Nov-2024	✓	**06-Jun-2024**	24-Nov-2024	✓
HDPE (no PTFE) (EP231X) 0089_PW329_240528	**28-May-2024**	**06-Jun-2024**	24-Nov-2024	✓	**07-Jun-2024**	24-Nov-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)							
Alkalinity by Auto Titrator	ED037-P	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	4	37	**10.81**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	44	**4.55**	**10.00**	×	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Alkalinity by Auto Titrator	ED037-P	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	2	37	**5.41**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	3	44	**6.82**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Alkalinity by Auto Titrator	ED037-P	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	2	37	**5.41**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	3	44	**6.82**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Chloride by Discrete Analyser	ED045G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	44	**4.55**	**5.00**	×	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	20	**5.00**	**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
Alkalinity by Auto Titrator	ED037-P	WATER	In house: Referenced to APHA 2320 B This procedure determines alkalinity by automated measurement (e.g. PC Titrate) on a settled supernatant aliquot of the sample using pH 4.5 for indicating the total alkalinity end-point. This method is compliant with NEPM Schedule B(3)
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	WATER	In house: Referenced to APHA 4500-SO4. Dissolved sulfate is determined in a 0.45um filtered sample. Sulfate ions are converted to a barium sulfate suspension in an acetic acid medium with barium chloride. Light absorbance of the BaSO4 suspension is measured by a photometer and the SO4-2 concentration is determined by comparison of the reading with a standard curve. This method is compliant with NEPM Schedule B(3)
Chloride by Discrete Analyser	ED045G	WATER	In house: Referenced to APHA 4500 Cl - G.The thiocyanate ion is liberated from mercuric thiocyanate through sequestration of mercury by the chloride ion to form non-ionised mercuric chloride. In the presence of ferric ions the liberated thiocynate forms highly-coloured ferric thiocynate which is measured at 480 nm.
Major Cations - Dissolved	ED093F	WATER	In house: Referenced to APHA 3120 and 3125; USEPA SW 846 - 6010 and 6020; Cations are determined by either ICP-AES or ICP-MS techniques. This method is compliant with NEPM Schedule B(3) Sodium Adsorption Ratio is calculated from Ca, Mg and Na which determined by ALS in house method QWI-EN/ED093F. This method is compliant with NEPM Schedule B(3) Hardness parameters are calculated based on APHA 2340 B. This method is compliant with NEPM Schedule B(3)
Ionic Balance by PCT DA and Turbi SO4 DA	* EN055 - PG	WATER	In house: Referenced to APHA 1030F. This method is compliant with NEPM Schedule B(3)
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.

ALSCompass
SAMPLING *Intelligence*

ALS

Environmental Division
Perth
Work Order Reference
EP2407384

Telephone : +61-8-9406 1301

Custody Document for Submissions via ALS Compass App

Project: WA_0089_PPASOMP_24 Client: STANTEC Project Manager: [redacted]

ALS Compass COC Reference: 69243 69221 69274 69275 69271 69276 # Samples: 69255 69272 69267 Phone: ( ) Sampler: [redacted] Phone: ( )

Turnaround Requirements: Standard _____ Urgent _____

Special Instructions:

Custody:

Relinquished by:	Received by:	Relinquished by:	Received by:
STANTEC	[redacted]		
Date / Time: 24/5/24 4 PM	Date / Time: 24/5 1230	Date / Time:	Date / Time:

CHAIN OF CUSTODY

COC#: 68267 ALS Laboratory: EP Perth Environmental

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

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP_24

SITE: Stirling GW - MB

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted] derp.labreports@esdat.com.au

EMAIL INVOICES 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	Rinsate WATER	WA OMP Water Suite WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
001	0089_MW217		28/05/2024 08:26 AM	WATER	ALS: 3 Non ALS: 0	No		X		
002	0089_MW220		28/05/2024 09:09 AM	WATER	ALS: 3 Non ALS: 0	No		X		
003	0089_MW224		28/05/2024 09:10 AM	WATER	ALS: 3 Non ALS: 0	No		X		
004	0089_MW225		28/05/2024 09:48 AM	WATER	ALS: 5 Non ALS: 0	No		X		Extra pfas bottles for lab qc
005	0089_MW215		28/05/2024 11:03 AM	WATER	ALS: 3 Non ALS: 0	No		X		
006	0089_MW214		28/05/2024 11:19 AM	WATER	ALS: 3 Non ALS: 0	No		X		
007	0089_MW216		28/05/2024 11:33 AM	WATER	ALS: 3 Non ALS: 0	No		X		

CHAIN OF CUSTODY

COC#: 68267 *ALS Laboratory:* EP Perth Environmental

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

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP_24

SITE: Stirling GW - MB

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted] derp.labreports@esdat.com.au

EMAIL INVOICES 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	Rinsate WATER	WA OMP Water Suite WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
008	0089_MW256		28/05/2024 12:58 PM	WATER	ALS: 3 Non ALS: 0	No		X		
009	0089_MW255		28/05/2024 01:08 PM	WATER	ALS: 5 Non ALS: 0	No		X		Extra bottles for lab qc
010	0089_MW257		28/05/2024 01:25 PM	WATER	ALS: 3 Non ALS: 0	No		X		
011	0089_MW258		28/05/2024 01:37 PM	WATER	ALS: 3 Non ALS: 0	No		X		
012	0089_MW259		28/05/2024 01:49 PM	WATER	ALS: 3 Non ALS: 0	No		X		
013	0089_QC301			WATER	ALS: 0 Non ALS: 0	No	X			
014	0089_QC302			WATER	ALS: 0 Non ALS: 0	No	X			

CHAIN OF CUSTODY

COC#: 68267 ALS Laboratory: EP Perth Environmental

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

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP_24

SITE: Stirling GW - MB

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted] SAMPLER MOBILE [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted] derp.labreports@esdat.com.au

EMAIL INVOICES 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	Rinsate WATER	WA OMP Water Suite WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
015	0089_QC303			WATER	ALS: 0 Non ALS: 0	No	X			
016	0089_QC401			WATER	ALS: 0 Non ALS: 0	No	X			
017	0089_QC402			WATER	ALS: 0 Non ALS: 0	No	X			
018	0089_QC403			WATER	ALS: 0 Non ALS: 0	No	X			

CHAIN OF CUSTODY

ALS COC#: 68267 ALS Laboratory: EP Perth Environmental

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP_24

SITE: Stirling GW - MB

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted] derp.labreports@esdat.com.au

EMAIL INVOICES TO: [redacted]

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

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	0089_MW217	Clear Plastic Bottle - Natural	125 mL	00071121160978	Green	No	
001	0089_MW217	HDPE (no PTFE)	20 mL	00352312048703	Grey	No	
001	0089_MW217	HDPE (no PTFE)	20 mL	00352312048522	Grey	No	
002	0089_MW220	HDPE (no PTFE)	20 mL	00352312048600	Grey	No	
002	0089_MW220	HDPE (no PTFE)	20 mL	00351221024762	Grey	No	
002	0089_MW220	Clear Plastic Bottle - Natural	125 mL	00071121177796	Green	No	
003	0089_MW224	HDPE (no PTFE)	20 mL	00351221024800	Grey	No	
003	0089_MW224	HDPE (no PTFE)	20 mL	00351221024786	Grey	No	
003	0089_MW224	Clear Plastic Bottle - Natural	125 mL	00071121177876	Green	No	
004	0089_MW225	Clear Plastic Bottle - Natural	125 mL	00071121178047	Green	No	
004	0089_MW225	HDPE (no PTFE)	20 mL	00352312048464	Grey	No	
004	0089_MW225	HDPE (no PTFE)	20 mL	00352312048764	Grey	No	
004	0089_MW225	HDPE (no PTFE)	20 mL	00351221027048	Grey	No	
005	0089_MW215	Clear Plastic Bottle - Natural	20 mL	00351221027123	Grey	No	
005	0089_MW215	HDPE (no PTFE)	125 mL	00071121177985	Green	No	
005	0089_MW215	HDPE (no PTFE)	20 mL	00351221024740	Grey	No	
006	0089_MW214	Clear Plastic Bottle - Natural	20 mL	00351221024752	Grey	No	
006	0089_MW214	HDPE (no PTFE)	125 mL	00071121178076	Green	No	
006	0089_MW214	HDPE (no PTFE)	20 mL	00351221024784	Grey	No	
007	0089_MW216	Clear Plastic Bottle - Natural	20 mL	00352312048748	Grey	No	
007	0089_MW216	HDPE (no PTFE)	125 mL	00071121177962	Green	No	
007	0089_MW216	HDPE (no PTFE)	20 mL	00352312048772	Grey	No	
008	0089_MW256	HDPE (no PTFE)	20 mL	00351221024813	Grey	No	
008	0089_MW256	HDPE (no PTFE)	20 mL	00352312048740	Grey	No	
008	0089_MW256	Clear Plastic Bottle - Natural	20 mL	00351221024830	Grey	No	
			125 mL	00071121160994	Green	No	

CHAIN OF CUSTODY

COC#: 68267 *ALS Laboratory:* EP Perth Environmental

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP_24

SITE: Stirling GW - MB

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted] derp.labreports@esdat.com.au

EMAIL INVOICES TO: [redacted]

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

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:

009	0089_MW255	HDPE (no PTFE)	20 mL	00352312048785	Grey	No	
009	0089_MW255	HDPE (no PTFE)	20 mL	00351221027995	Grey	No	
009	0089_MW255	HDPE (no PTFE)	20 mL	00351221024865	Grey	No	
009	0089_MW255	HDPE (no PTFE)	20 mL	00351221027289	Grey	No	
010	0089_MW257	Clear Plastic Bottle - Natural	125 mL	00070821217664	Green	No	
010	0089_MW257	HDPE (no PTFE)	20 mL	00351221024645	Grey	No	
010	0089_MW257	HDPE (no PTFE)	20 mL	00351221024667	Grey	No	
011	0089_MW258	Clear Plastic Bottle - Natural	125 mL	00071121160997	Green	No	
011	0089_MW258	Clear Plastic Bottle - Natural	125 mL	00070821217694	Green	No	
011	0089_MW258	HDPE (no PTFE)	20 mL	00351221024648	Grey	No	
012	0089_MW259	HDPE (no PTFE)	20 mL	00352312048766	Grey	No	
012	0089_MW259	HDPE (no PTFE)	20 mL	00352312048696	Grey	No	
012	0089_MW259	Clear Plastic Bottle - Natural	125 mL	00071121178106	Green	No	

Total Bottle Count: ALS: 40, Non ALS: 0

SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : **EP2407384**

Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: [redacted]
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
E-mail	: [redacted]stantec.com	E-mail	: [redacted]alsglobal.com
Telephone	: ----	Telephone	: +61-8-9406 1301
Facsimile	: ----	Facsimile	: +61-8-9406 1399
Project	: WA_0089_PFASOMP_24	Page	: 1 of 2
Order number	: pfas-omp/Stirling	Quote number	: ES2022MWHAUS0002 (SY/139/19 B)
C-O-C number	: 68267	QC Level	: NEPM 2013 B3 & ALS QC Standard
Site	: Stirling GW - MB		
Sampler	: [redacted]		

Dates

Date Samples Received	: 29-May-2024 12:30	Issue Date	: 30-May-2024
Client Requested Due Date	: 10-Jun-2024	Scheduled Reporting Date	: **10-Jun-2024**

Delivery Details

Mode of Delivery	: Carrier	Security Seal	: Not Available
No. of coolers/boxes	: 2	Temperature	: 14.1 - Ice present
Receipt Detail	:	No. of samples received / analysed	: 18 / 18

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 see scanned COC for sample discrepencies: extra samples , samples not received etc.
- Please direct any queries related to sample condition / numbering / breakages to Sample Receipt (Samples.Perth@alsglobal.com)
- Analytical work for this work order will be conducted at ALS Environmental Perth.
- Please direct any turnaround / technical queries to the laboratory contact designated above.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months) from receipt of samples.
- **pH analysis should be conducted within 6 hours of sampling.**
- **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.**
- 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 (30 analytes)	WATER - NT-01 & 02 Ca, Mg, Na, K, Cl, SO4, Alkalinity
EP2407384-001	28-May-2024 08:26	0089_MW217_240528	✓	✓
EP2407384-002	28-May-2024 09:09	0089_MW220_240528	✓	✓
EP2407384-003	28-May-2024 09:10	0089_MW224_240528	✓	✓
EP2407384-004	28-May-2024 09:48	0089_MW225_240528	✓	✓
EP2407384-005	28-May-2024 11:03	0089_MW215_240528	✓	✓
EP2407384-006	28-May-2024 11:19	0089_MW214_240528	✓	✓
EP2407384-007	28-May-2024 11:33	0089_MW216_240528	✓	✓
EP2407384-008	28-May-2024 12:58	0089_MW256_240528	✓	✓
EP2407384-009	28-May-2024 13:08	0089_MW255_240528	✓	✓
EP2407384-010	28-May-2024 13:25	0089_MW257_240528	✓	✓
EP2407384-011	28-May-2024 13:37	0089_MW258_240528	✓	✓
EP2407384-012	28-May-2024 13:49	0089_MW259_240528	✓	✓
EP2407384-013	28-May-2024 13:51	0089_QC301_240528	✓	
EP2407384-014	28-May-2024 13:51	0089_QC302_240528	✓	
EP2407384-015	28-May-2024 13:51	0089_QC303_240528	✓	
EP2407384-016	28-May-2024 13:51	0089_QC401_240528	✓	
EP2407384-017	28-May-2024 13:52	0089_QC402_240528	✓	
EP2407384-018	28-May-2024 14:12	0089_QC403_240528	✓	

Proactive Holding Time Report

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

Requested Deliverables

[redacted]
- A4 - AU Tax Invoice (INV) — Email — [redacted]cardno.com.au

DERP LAB REPORTS
- EDI Format - ESDAT (ESDAT) — Email — derp.labreports@esdat.com.au

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

CERTIFICATE OF ANALYSIS

Work Order	: **EP2407384**	Page	: 1 of 16
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: [redacted]
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: +61-8-9406 1301
Project	: WA_0089_PFASOMP_24	Date Samples Received	: 29-May-2024 12:30
Order number	: pfas-omp/Stirling	Date Analysis Commenced	: 31-May-2024
C-O-C number	: 68267	Issue Date	: 10-Jun-2024 17:27
Sampler	: [redacted]		
Site	: Stirling GW - MB		
Quote number	: SY/139/19 B		
No. of samples received	: 18		
No. of samples analysed	: 18		

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]	Inorganics Supervisor	Perth Inorganics, Wangara, WA
[redacted]	Laboratory Manager (Perth)	Perth Inorganics, Wangara, WA
[redacted]	Metals Chemist	Perth Inorganics, Wangara, WA
[redacted]	Senior Organic Chemist	Perth Organics, Wangara, WA

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.
- As per QWI – EN55-3 Data Interpreting Procedures, Ionic balances are typically calculated using Major Anions - Chloride, Alkalinity and Sulfate; and Major Cations - Calcium, Magnesium, Potassium and Sodium. Where applicable and dependent upon sample matrix, the Ionic Balance may also include the additional contribution of Ammonia, Dissolved Metals by ICPMS and H+ to the Cations and Nitrate, SiO2 and Fluoride to the Anions.
- ED037-P (Alkalinity) Sample 1 was filtered prior to titration due to the presence of particulate material which may consume additional titrant.
- Sodium Adsorption Ratio (where reported): Where results for Na, Ca or Mg are <LOR, a concentration at half the reported LOR is incorporated into the SAR calculation. This represents a conservative approach for Na relative to the assumption that <LOR = zero concentration and a conservative approach for Ca & Mg relative to the assumption that <LOR is equivalent to the LOR concentration.
- 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.
- ED045G: The presence of Thiocyanate, Thiosulfate and Sulfite can positively contribute to the chloride result, thereby may bias results higher than expected. Results should be scrutinised accordingly.

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW217_240528	0089_MW220_240528	0089_MW224_240528	0089_MW225_240528	0089_MW215_240528
				Sampling date / time	28-May-2024 08:26	28-May-2024 09:09	28-May-2024 09:10	28-May-2024 09:48	28-May-2024 11:03
Compound	CAS Number	LOR	Unit		EP2407384-001	EP2407384-002	EP2407384-003	EP2407384-004	EP2407384-005
					Result	Result	Result	Result	Result
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	<1	<1	<1	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	<1	<1	<1	<1
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		277	238	260	461	380
Total Alkalinity as CaCO3	----	1	mg/L		277	238	260	461	380
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		32	24	36	56	98
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		52	39	106	932	541
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		101	80	55	158	160
Magnesium	7439-95-4	1	mg/L		11	13	23	82	41
Sodium	7440-23-5	1	mg/L		57	28	78	394	239
Potassium	7440-09-7	1	mg/L		11	6	3	12	17
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		7.67	6.36	8.93	36.7	24.9
ø Total Cations	----	0.01	meq/L		8.70	6.43	8.11	32.1	22.2
ø Ionic Balance	----	0.01	%		6.34	0.61	4.86	6.68	5.74
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		<0.02	0.06	<0.02	<0.02	0.10
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		0.02	0.04	<0.02	<0.02	0.16
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		0.02	0.40	<0.01	<0.01	1.20
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		<0.02	0.04	<0.02	<0.02	<0.02
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		0.05	9.03	0.01	<0.01	0.02
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW217_240528	0089_MW220_240528	0089_MW224_240528	0089_MW225_240528	0089_MW215_240528
				Sampling date / time	28-May-2024 08:26	28-May-2024 09:09	28-May-2024 09:10	28-May-2024 09:48	28-May-2024 11:03
Compound	CAS Number	LOR	Unit		EP2407384-001	EP2407384-002	EP2407384-003	EP2407384-004	EP2407384-005
					Result	Result	Result	Result	Result
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		**2.6**	**0.1**	<0.1	<0.1	<0.1
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		**7.88**	**0.16**	<0.02	<0.02	**0.08**
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		**4.46**	**0.18**	<0.02	<0.02	**0.30**
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		**1.11**	**0.08**	<0.02	<0.02	**0.08**
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		**0.31**	**0.09**	<0.01	<0.01	**0.03**
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		<0.02	**0.04**	<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
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									

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW217_240528	0089_MW220_240528	0089_MW224_240528	0089_MW225_240528	0089_MW215_240528
				Sampling date / time	28-May-2024 08:26	28-May-2024 09:09	28-May-2024 09:10	28-May-2024 09:48	28-May-2024 11:03
Compound	CAS Number	LOR	Unit		EP2407384-001	EP2407384-002	EP2407384-003	EP2407384-004	EP2407384-005
					Result	Result	Result	Result	Result
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
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		**19.7**	<0.05	<0.05	<0.05	<0.05
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		**0.30**	<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		**36.4**	**10.2**	**0.01**	<0.01	**2.00**
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		**0.07**	**9.43**	**0.01**	<0.01	**1.22**
Sum of PFAS (WA DER List)	----	0.01	µg/L		**36.4**	**10.1**	**0.01**	<0.01	**1.81**
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**109**	**102**	**97.5**	**107**	**108**
13C8-PFOA	----	0.02	%		**107**	**110**	**100**	**112**	**102**

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW214_240528	0089_MW216_240528	0089_MW256_240528	0089_MW255_240528	0089_MW257_240528
				Sampling date / time	28-May-2024 11:19	28-May-2024 11:33	28-May-2024 12:58	28-May-2024 13:08	28-May-2024 13:25
Compound	CAS Number	LOR	Unit		EP2407384-006	EP2407384-007	EP2407384-008	EP2407384-009	EP2407384-010
					Result	Result	Result	Result	Result
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	<1	<1	<1	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	<1	<1	<1	<1
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		369	318	651	384	243
Total Alkalinity as CaCO3	----	1	mg/L		369	318	651	384	243
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		50	91	68	38	19
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		825	557	649	53	37
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		178	162	144	98	80
Magnesium	7439-95-4	1	mg/L		58	55	110	22	11
Sodium	7440-23-5	1	mg/L		376	271	326	57	25
Potassium	7440-09-7	1	mg/L		9	14	9	3	4
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		31.7	24.0	32.7	9.96	6.29
ø Total Cations	----	0.01	meq/L		30.2	24.8	30.6	9.26	6.09
ø Ionic Balance	----	0.01	%		2.33	1.63	3.28	3.65	1.67
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		<0.02	0.25	6.66	0.37	<0.02
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		<0.02	0.23	6.74	0.36	<0.02
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		<0.01	1.58	26.8	8.73	1.61
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		<0.02	0.08	1.23	<0.02	0.05
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		<0.01	0.63	16.8	0.34	0.08
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	<0.02	0.03	<0.02	<0.02

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW214_240528	0089_MW216_240528	0089_MW256_240528	0089_MW255_240528	0089_MW257_240528
				Sampling date / time	28-May-2024 11:19	28-May-2024 11:33	28-May-2024 12:58	28-May-2024 13:08	28-May-2024 13:25
Compound	CAS Number	LOR	Unit		EP2407384-006	EP2407384-007	EP2407384-008	EP2407384-009	EP2407384-010
					Result	Result	Result	Result	Result
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		<0.1	**2.0**	**1.3**	**0.2**	<0.1
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		<0.02	**6.44**	**2.69**	**0.21**	**0.28**
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		<0.02	**2.95**	**12.0**	**0.79**	**0.20**
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		<0.02	**0.35**	**1.29**	**0.17**	**0.04**
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		<0.01	**0.18**	**1.44**	**0.05**	**0.21**
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		<0.02	<0.02	**0.03**	<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	**0.06**	<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
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									

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW214_240528	0089_MW216_240528	0089_MW256_240528	0089_MW255_240528	0089_MW257_240528
				Sampling date / time	28-May-2024 11:19	28-May-2024 11:33	28-May-2024 12:58	28-May-2024 13:08	28-May-2024 13:25
Compound	CAS Number	LOR	Unit		EP2407384-006	EP2407384-007	EP2407384-008	EP2407384-009	EP2407384-010
					Result	Result	Result	Result	Result
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
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	**2.01**	**0.71**	<0.05	**0.11**
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	**16.7**	**78.1**	**11.4**	**2.58**
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		<0.01	**2.21**	**43.6**	**9.07**	**1.69**
Sum of PFAS (WA DER List)	----	0.01	µg/L		<0.01	**16.4**	**69.7**	**10.9**	**2.53**
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**102**	**105**	**97.2**	**102**	**86.3**
13C8-PFOA	----	0.02	%		**102**	**107**	**102**	**97.3**	**84.6**

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW258_240528	0089_MW259_240528	----	----	----
				Sampling date / time	28-May-2024 13:37	28-May-2024 13:49	----	----	----
Compound	CAS Number	LOR	Unit		EP2407384-011	EP2407384-012	--------	--------	--------
					Result	Result	----	----	----
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	<1	----	----	----
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	<1	----	----	----
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		**368**	**388**	----	----	----
Total Alkalinity as CaCO3	----	1	mg/L		**368**	**388**	----	----	----
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		**79**	**14**	----	----	----
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		**190**	**50**	----	----	----
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		**132**	**108**	----	----	----
Magnesium	7439-95-4	1	mg/L		**42**	**27**	----	----	----
Sodium	7440-23-5	1	mg/L		**104**	**38**	----	----	----
Potassium	7440-09-7	1	mg/L		**17**	**6**	----	----	----
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		**14.4**	**9.45**	----	----	----
ø Total Cations	----	0.01	meq/L		**15.0**	**9.42**	----	----	----
ø Ionic Balance	----	0.01	%		**2.20**	**0.19**	----	----	----
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		**10.9**	<0.02	----	----	----
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		**8.04**	<0.02	----	----	----
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		**29.5**	**0.11**	----	----	----
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		**3.06**	<0.02	----	----	----
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		**4.88**	**0.12**	----	----	----
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	<0.02	----	----	----

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW258_240528	0089_MW259_240528	----	----	----
				Sampling date / time	28-May-2024 13:37	28-May-2024 13:49	----	----	----
Compound	CAS Number	LOR	Unit		EP2407384-011	EP2407384-012	--------	--------	--------
					Result	Result	----	----	----
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		**2.7**	<0.1	----	----	----
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		**4.18**	**0.06**	----	----	----
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		**15.7**	**0.04**	----	----	----
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		**1.88**	<0.02	----	----	----
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		**1.55**	<0.01	----	----	----
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		<0.05	<0.05	----	----	----
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L		<0.02	<0.02	----	----	----
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L		<0.05	<0.05	----	----	----
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L		<0.05	<0.05	----	----	----
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L		<0.05	<0.05	----	----	----
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L		<0.05	<0.05	----	----	----
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L		<0.02	<0.02	----	----	----
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L		<0.02	<0.02	----	----	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids									

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW258_240528	0089_MW259_240528	----	----	----
				Sampling date / time	28-May-2024 13:37	28-May-2024 13:49	----	----	----
Compound	CAS Number	LOR	Unit		EP2407384-011	EP2407384-012	--------	--------	--------
					Result	Result	----	----	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L		<0.05	<0.05	----	----	----
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		**0.12**	<0.05	----	----	----
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		<0.05	<0.05	----	----	----
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L		<0.05	<0.05	----	----	----
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L		**82.5**	**0.33**	----	----	----
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		**34.4**	**0.23**	----	----	----
Sum of PFAS (WA DER List)	----	0.01	µg/L		**71.4**	**0.33**	----	----	----
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**106**	**106**	----	----	----
13C8-PFOA	----	0.02	%		**106**	**99.2**	----	----	----

Analytical Results

Sub-Matrix: RINSATE (Matrix: WATER)				Sample ID	0089_QC301_240528	0089_QC302_240528	0089_QC303_240528	0089_QC401_240528	0089_QC402_240528
				Sampling date / time	28-May-2024 13:51	28-May-2024 13:51	28-May-2024 13:51	28-May-2024 13:51	28-May-2024 13:52
Compound	CAS Number	LOR	Unit		EP2407384-013	EP2407384-014	EP2407384-015	EP2407384-016	EP2407384-017
					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: RINSATE (Matrix: WATER)				Sample ID	0089_QC301_240528	0089_QC302_240528	0089_QC303_240528	0089_QC401_240528	0089_QC402_240528
				Sampling date / time	28-May-2024 13:51	28-May-2024 13:51	28-May-2024 13:51	28-May-2024 13:51	28-May-2024 13:52
Compound	CAS Number	LOR	Unit		EP2407384-013	EP2407384-014	EP2407384-015	EP2407384-016	EP2407384-017
					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	%		**99.1**	**95.6**	**104**	**102**	**98.7**
13C8-PFOA	----	0.02	%		**107**	**106**	**103**	**100**	**104**

Analytical Results

Sub-Matrix: RINSATE (Matrix: WATER)				Sample ID	0089_QC403_240528	----	----	----	----
				Sampling date / time	28-May-2024 14:12	----	----	----	----
Compound	CAS Number	LOR	Unit		EP2407384-018	--------	--------	--------	--------
					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: RINSATE (Matrix: WATER)				Sample ID	0089_QC403_240528	----	----	----	----
				Sampling date / time	28-May-2024 14:12	----	----	----	----
Compound	CAS Number	LOR	Unit		EP2407384-018	--------	--------	--------	--------
					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	%		**98.6**	----	----	----	----
13C8-PFOA	----	0.02	%		**102**	----	----	----	----

Surrogate Control Limits

Sub-Matrix: GROUNDWATER		Recovery Limits (%)	
Compound	CAS Number	Low	High
EP231S: PFAS Surrogate			
13C4-PFOS	----	65	140
13C8-PFOA	----	71	133

Sub-Matrix: RINSATE		Recovery Limits (%)	
Compound	CAS Number	Low	High
EP231S: PFAS Surrogate			
13C4-PFOS	----	65	140
13C8-PFOA	----	71	133

QUALITY CONTROL REPORT

Work Order	: **EP2407384**	Page	: 1 of 15
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: [redacted]
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: +61-8-9406 1301
Project	: WA_0089_PFASOMP_24	Date Samples Received	: 29-May-2024
Order number	: pfas-omp/Stirling	Date Analysis Commenced	: 31-May-2024
C-O-C number	: 68267	Issue Date	: 10-Jun-2024
Sampler	: [redacted]		
Site	: Stirling GW - MB		
Quote number	: SY/139/19 B		
No. of samples received	: 18		
No. of samples analysed	: 18		

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]	Inorganics Supervisor	Perth Inorganics, Wangara, WA
[redacted]	Laboratory Manager (Perth)	Perth Inorganics, Wangara, WA
[redacted]	Metals Chemist	Perth Inorganics, Wangara, WA
[redacted]	Senior Organic Chemist	Perth Organics, Wangara, WA

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 (%)
ED037P: Alkalinity by PC Titrator (QC Lot: 5828918)									
EP2407337-002	Anonymous	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	120	120	0.0	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	120	120	0.0	0% - 20%
EP2407337-012	Anonymous	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	120	120	0.0	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	120	120	0.0	0% - 20%
ED037P: Alkalinity by PC Titrator (QC Lot: 5836852)									
EP2407384-008	0089_MW256_240528	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	651	651	0.0	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	651	651	0.0	0% - 20%
EP2407413-008	Anonymous	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	123	123	0.0	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	123	123	0.0	0% - 20%
ED037P: Alkalinity by PC Titrator (QC Lot: 5837072)									
EP2407583-004	Anonymous	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	352	352	0.0	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	352	352	0.0	0% - 20%

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 (%)
ED037P: Alkalinity by PC Titrator (QC Lot: 5837072) - continued									
EP2407569-001	Anonymous	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	133	134	0.0	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	133	134	0.0	0% - 20%
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QC Lot: 5827150)									
EP2407272-001	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	2610	2560	1.8	0% - 20%
EP2407384-003	0089_MW224_240528	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	36	36	0.0	0% - 20%
ED045G: Chloride by Discrete Analyser (QC Lot: 5827151)									
EP2407272-001	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	16900	15800	7.0	0% - 20%
EP2407384-003	0089_MW224_240528	ED045G: Chloride	16887-00-6	1	mg/L	106	107	0.0	0% - 20%
ED093F: Dissolved Major Cations (QC Lot: 5827886)									
EP2407030-023	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	247	245	1.0	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	640	631	1.4	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	4520	4470	1.1	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	254	250	1.4	0% - 20%
EP2407337-004	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	444	445	0.0	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	1380	1380	0.0	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	10400	10400	0.8	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	589	583	0.9	0% - 20%
ED093F: Dissolved Major Cations (QC Lot: 5827887)									
EP2407384-002	0089_MW220_240528	ED093F: Calcium	7440-70-2	1	mg/L	80	76	5.8	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	13	12	0.0	0% - 50%
		ED093F: Sodium	7440-23-5	1	mg/L	28	25	12.0	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	6	6	0.0	No Limit
EP2407462-001	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	10	10	0.0	No Limit
		ED093F: Magnesium	7439-95-4	1	mg/L	11	11	0.0	0% - 50%
		ED093F: Sodium	7440-23-5	1	mg/L	70	70	0.0	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	12	11	0.0	0% - 50%
ED093F: Dissolved Major Cations (QC Lot: 5827901)									
EP2407316-001	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	441	440	0.3	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	1370	1370	0.1	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	10400	10400	0.5	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	581	582	0.0	0% - 20%
EP2407384-005	0089_MW215_240528	ED093F: Calcium	7440-70-2	1	mg/L	160	164	2.2	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	41	42	0.0	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	239	242	1.0	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	17	17	0.0	0% - 50%

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 (%)*
ED093F: Dissolved Major Cations (QC Lot: 5827902)									
EP2407316-010	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	440	438	0.3	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	1380	1380	0.0	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	10500	10500	0.1	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	588	588	0.0	0% - 20%
EP2407384-010	0089_MW257_240528	ED093F: Calcium	7440-70-2	1	mg/L	80	80	0.0	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	11	10	0.0	0% - 50%
		ED093F: Sodium	7440-23-5	1	mg/L	25	23	6.4	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	4	4	0.0	No Limit
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 5835276)									
EP2407413-004	Anonymous	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
EP2407413-015	Anonymous	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	0.04	0.02	67.4	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: 5835294)									
EP2407384-004	0089_MW225_240528	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
EP2407384-013	0089_QC301_240528	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
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 5835276)									
EP2407413-004	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

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: 5835276) - continued									
EP2407413-004	Anonymous	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
EP2407413-015	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
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 5835294)									
EP2407384-004	0089_MW225_240528	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
EP2407384-013	0089_QC301_240528	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

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: 5835294) - continued									
EP2407384-013	0089_QC301_240528	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: 5835276)									
EP2407413-004	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
EP2407413-015	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
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 5835294)									
EP2407384-004	0089_MW225_240528	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

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: 5835294) - continued									
EP2407384-004	0089_MW225_240528	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
EP2407384-013	0089_QC301_240528	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: 5835276)									
EP2407413-004	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
EP2407413-015	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
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 5835294)									
EP2407384-004	0089_MW225_240528	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: 5835294) - continued									
EP2407384-004	0089_MW225_240528	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
EP2407384-013	0089_QC301_240528	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: 5835276)									
EP2407413-004	Anonymous	EP231X: Sum of PFAS	----	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	<0.01	<0.01	0.0	No Limit
EP2407413-015	Anonymous	EP231X: Sum of PFAS	----	0.01	µg/L	0.04	0.02	66.7	No Limit
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	0.04	0.02	66.7	No Limit
		EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	0.04	0.02	66.7	No Limit
EP231P: PFAS Sums (QC Lot: 5835294)									
EP2407384-004	0089_MW225_240528	EP231X: Sum of PFAS	----	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	<0.01	<0.01	0.0	No Limit
EP2407384-013	0089_QC301_240528	EP231X: Sum of PFAS	----	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	<0.01	<0.01	0.0	No Limit

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
ED037P: Alkalinity by PC Titrator (QCLot: 5828918)								
ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	----	----	----	----
ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	----	----	----	----
ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	<1	----	----	----	----
ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	<1	20 mg/L	94.0	85.1	126
				<1	200 mg/L	98.5	90.5	111
ED037P: Alkalinity by PC Titrator (QCLot: 5836852)								
ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	----	----	----	----
ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	----	----	----	----
ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	<1	----	----	----	----
ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	<1	20 mg/L	101	85.1	126
				<1	200 mg/L	99.4	90.5	111
ED037P: Alkalinity by PC Titrator (QCLot: 5837072)								
ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	----	----	----	----
ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	----	----	----	----
ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	<1	----	----	----	----
ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	<1	20 mg/L	120	85.1	126
				<1	200 mg/L	108	90.5	111
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 5827150)								
ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<1	25 mg/L	109	89.9	112
				<1	500 mg/L	98.9	89.9	112
ED045G: Chloride by Discrete Analyser (QCLot: 5827151)								
ED045G: Chloride	16887-00-6	1	mg/L	<1	10 mg/L	103	88.6	113
				<1	1000 mg/L	96.0	88.6	113
ED093F: Dissolved Major Cations (QCLot: 5827886)								
ED093F: Calcium	7440-70-2	1	mg/L	<1	50 mg/L	103	86.5	117
ED093F: Magnesium	7439-95-4	1	mg/L	<1	50 mg/L	103	88.4	110
ED093F: Sodium	7440-23-5	1	mg/L	<1	50 mg/L	99.7	91.4	113
ED093F: Potassium	7440-09-7	1	mg/L	<1	50 mg/L	96.9	84.6	108

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
ED093F: Dissolved Major Cations (QCLot: 5827887)								
ED093F: Calcium	7440-70-2	1	mg/L	<1	50 mg/L	104	86.5	117
ED093F: Magnesium	7439-95-4	1	mg/L	<1	50 mg/L	103	88.4	110
ED093F: Sodium	7440-23-5	1	mg/L	<1	50 mg/L	101	91.4	113
ED093F: Potassium	7440-09-7	1	mg/L	<1	50 mg/L	96.6	84.6	108
ED093F: Dissolved Major Cations (QCLot: 5827901)								
ED093F: Calcium	7440-70-2	1	mg/L	<1	50 mg/L	101	86.5	117
ED093F: Magnesium	7439-95-4	1	mg/L	<1	50 mg/L	100	88.4	110
ED093F: Sodium	7440-23-5	1	mg/L	<1	50 mg/L	99.3	91.4	113
ED093F: Potassium	7440-09-7	1	mg/L	<1	50 mg/L	96.3	84.6	108
ED093F: Dissolved Major Cations (QCLot: 5827902)								
ED093F: Calcium	7440-70-2	1	mg/L	<1	50 mg/L	99.9	86.5	117
ED093F: Magnesium	7439-95-4	1	mg/L	<1	50 mg/L	99.1	88.4	110
ED093F: Sodium	7440-23-5	1	mg/L	<1	50 mg/L	98.2	91.4	113
ED093F: Potassium	7440-09-7	1	mg/L	<1	50 mg/L	95.2	84.6	108
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5835276)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.2218 µg/L	96.0	72.0	130
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.2352 µg/L	108	71.0	127
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	0.2373 µg/L	97.3	68.0	131
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.238 µg/L	101	69.0	134
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.232 µg/L	97.8	65.0	140
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.241 µg/L	91.7	53.0	142
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5835294)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.2218 µg/L	97.4	72.0	130
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.2352 µg/L	83.5	71.0	127
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	0.2373 µg/L	93.6	68.0	131
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.238 µg/L	105	69.0	134
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.232 µg/L	97.6	65.0	140
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.241 µg/L	101	53.0	142
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5835276)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	1.25 µg/L	103	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	99.2	72.0	129
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	0.25 µg/L	103	72.0	130
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	0.25 µg/L	97.4	71.0	133

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
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5835276) - continued								
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	97.8	71.0	129
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	0.25 µg/L	103	69.0	133
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	0.25 µg/L	101	72.0	134
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	0.25 µg/L	110	65.0	144
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	0.25 µg/L	106	71.0	132
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5835294)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	1.25 µg/L	97.2	73.0	129
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	0.25 µg/L	104	72.0	129
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	0.25 µg/L	111	72.0	129
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	0.25 µg/L	101	72.0	130
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	0.25 µg/L	96.6	71.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	0.25 µg/L	96.4	69.0	130
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	0.25 µg/L	97.0	71.0	129
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	0.25 µg/L	105	69.0	133
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	0.25 µg/L	102	72.0	134
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	0.25 µg/L	95.2	65.0	144
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	0.25 µg/L	100	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5835276)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.25 µg/L	105	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	0.625 µg/L	108	68.0	141
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	0.625 µg/L	98.4	60.5	138
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	0.625 µg/L	104	68.3	134
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	0.625 µg/L	112	62.2	138
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	0.25 µg/L	102	65.0	136
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	0.25 µg/L	104	61.0	135
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5835294)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.25 µg/L	96.6	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	0.625 µg/L	97.3	68.0	141
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	0.625 µg/L	102	60.5	138
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	0.625 µg/L	112	68.3	134

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: 5835294) - continued								
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	0.625 µg/L	93.6	62.2	138
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	0.25 µg/L	111	65.0	136
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	0.25 µg/L	99.4	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5835276)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.2343 µg/L	108	63.0	143
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	0.2378 µg/L	109	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	0.24 µg/L	110	67.0	138
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	0.241 µg/L	113	64.2	133
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5835294)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.2343 µg/L	111	63.0	143
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	0.2378 µg/L	105	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	0.24 µg/L	115	67.0	138
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	0.241 µg/L	98.5	64.2	133
EP231P: PFAS Sums (QCLot: 5835276)								
EP231X: Sum of PFAS	----	0.01	µg/L	<0.01	----	----	----	----
EP231X: Sum of PFHxS and PFOS	355-46-4/17 63-23-1	0.01	µg/L	<0.01	----	----	----	----
EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	<0.01	----	----	----	----
EP231P: PFAS Sums (QCLot: 5835294)								
EP231X: Sum of PFAS	----	0.01	µg/L	<0.01	----	----	----	----
EP231X: Sum of PFHxS and PFOS	355-46-4/17 63-23-1	0.01	µg/L	<0.01	----	----	----	----
EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	<0.01	----	----	----	----

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
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 5827150)							
EP2407272-001	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	100 mg/L	# Not Determined	70.4	130

Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*Concentration*	*MS*	*Low*	*High*
ED045G: Chloride by Discrete Analyser (QCLot: 5827151)							
EP2407272-001	Anonymous	ED045G: Chloride	16887-00-6	200 mg/L	# Not Determined	70.0	130
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5835276)							
EP2407413-014	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.2218 µg/L	93.7	72.0	129
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.232 µg/L	98.9	71.0	127
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.2352 µg/L	89.6	68.0	129
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.238 µg/L	101	69.0	134
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.232 µg/L	90.4	65.0	140
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.241 µg/L	85.7	53.0	129
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5835294)							
EP2407384-009	0089_MW255_240528	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.2218 µg/L	82.9	72.0	129
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.232 µg/L	78.6	71.0	127
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.2352 µg/L	# Not Determined	68.0	129
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.238 µg/L	127	69.0	134
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.232 µg/L	92.4	65.0	140
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.241 µg/L	100	53.0	129
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5835276)							
EP2407413-014	Anonymous	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	1.25 µg/L	101	73.0	142
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.25 µg/L	100	72.0	129
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.25 µg/L	105	72.0	129
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.25 µg/L	102	72.0	130
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.25 µg/L	100	71.0	133
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.25 µg/L	99.2	69.0	130
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.25 µg/L	98.4	71.0	134
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.25 µg/L	102	69.0	133
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.25 µg/L	106	72.0	134
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.25 µg/L	121	65.0	144
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.25 µg/L	100	71.0	132
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5835294)							
EP2407384-009	0089_MW255_240528	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	1.25 µg/L	92.7	73.0	142
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.25 µg/L	87.4	72.0	129
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.25 µg/L	109	72.0	129
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.25 µg/L	82.8	72.0	130
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.25 µg/L	93.2	71.0	133
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.25 µg/L	92.7	69.0	130
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.25 µg/L	88.7	71.0	134
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.25 µg/L	97.8	69.0	133

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: 5835294) - continued							
EP2407384-009	0089_MW255_240528	EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.25 µg/L	98.7	72.0	134
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.25 µg/L	87.3	65.0	144
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.25 µg/L	88.7	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5835276)							
EP2407413-014	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.25 µg/L	101	59.0	135
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.625 µg/L	110	70.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.625 µg/L	105	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.625 µg/L	109	70.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.625 µg/L	106	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.25 µg/L	90.0	65.0	136
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.25 µg/L	93.9	61.0	135
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5835294)							
EP2407384-009	0089_MW255_240528	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.25 µg/L	94.2	59.0	135
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.625 µg/L	110	70.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.625 µg/L	91.3	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.625 µg/L	109	70.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.625 µg/L	113	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.25 µg/L	102	65.0	136
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.25 µg/L	94.5	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5835276)							
EP2407413-014	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.234 µg/L	98.9	63.0	143
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.2378 µg/L	114	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.24 µg/L	98.8	67.0	138
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.2415 µg/L	92.6	70.0	130
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5835294)							
EP2407384-009	0089_MW255_240528	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.234 µg/L	97.2	63.0	143
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.2378 µg/L	98.2	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.24 µg/L	92.0	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: 5835294) - continued							
EP2407384-009	0089_MW255_240528	EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.2415 µg/L	93.2	70.0	130

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **EP2407384**	Page	: 1 of 6
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Telephone	: +61-8-9406 1301
Project	: WA_0089_PFASOMP_24	Date Samples Received	: 29-May-2024
Site	: Stirling GW - MB	Issue Date	: 10-Jun-2024
Sampler	: [redacted]	No. of samples received	: 18
Order number	: pfas-omp/Stirling	No. of samples analysed	: 18

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.**
- **Matrix Spike outliers exist - please see following pages for full details.**
- **For all regular sample matrices, where applicable to the methodology, 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.**

Outliers : Quality Control Samples

Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

Matrix: **WATER**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
Matrix Spike (MS) Recoveries							
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA	EP2407272--001	Anonymous	**Sulfate as SO4 - Turbidimetric**	14808-79-8	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
ED045G: Chloride by Discrete Analyser	EP2407272--001	Anonymous	**Chloride**	16887-00-6	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
EP231A: Perfluoroalkyl Sulfonic Acids	EP2407384--009	0089_MW255_240528	**Perfluorohexane sulfonic acid (PFHxS)**	355-46-4	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**

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
ED037P: Alkalinity by PC Titrator							
Clear Plastic Bottle - Natural (ED037-P) 0089_MW216_240528, 0089_MW256_240528, 0089_MW255_240528, 0089_MW257_240528	**28-May-2024**	**----**	----	**----**	**05-Jun-2024**	11-Jun-2024	✓
Clear Plastic Bottle - Natural (ED037-P) 0089_MW258_240528, 0089_MW259_240528	**28-May-2024**	**----**	----	**----**	**06-Jun-2024**	11-Jun-2024	✓
Clear Plastic Bottle - Natural (ED037-P) 0089_MW217_240528, 0089_MW220_240528, 0089_MW224_240528, 0089_MW225_240528, 0089_MW215_240528, 0089_MW214_240528	**28-May-2024**	**----**	----	**----**	**31-May-2024**	11-Jun-2024	✓
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA							
Clear Plastic Bottle - Natural (ED041G) 0089_MW217_240528, 0089_MW220_240528, 0089_MW224_240528, 0089_MW225_240528, 0089_MW215_240528, 0089_MW214_240528, 0089_MW216_240528, 0089_MW256_240528, 0089_MW255_240528, 0089_MW257_240528, 0089_MW258_240528, 0089_MW259_240528	**28-May-2024**	**----**	----	**----**	**08-Jun-2024**	25-Jun-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
ED045G: Chloride by Discrete Analyser							
Clear Plastic Bottle - Natural (ED045G)							
0089_MW217_240528, 0089_MW220_240528, 0089_MW224_240528, 0089_MW225_240528, 0089_MW215_240528, 0089_MW214_240528, 0089_MW216_240528, 0089_MW256_240528, 0089_MW255_240528, 0089_MW257_240528, 0089_MW258_240528, 0089_MW259_240528	**28-May-2024**	**----**	----	**----**	**08-Jun-2024**	25-Jun-2024	✓
ED093F: Dissolved Major Cations							
Clear Plastic Bottle - Natural (ED093F)							
0089_MW215_240528, 0089_MW214_240528, 0089_MW216_240528, 0089_MW256_240528, 0089_MW255_240528, 0089_MW257_240528, 0089_MW258_240528, 0089_MW259_240528	**28-May-2024**	**----**	----	**----**	**04-Jun-2024**	04-Jun-2024	✓
Clear Plastic Bottle - Natural (ED093F)							
0089_MW217_240528, 0089_MW220_240528, 0089_MW224_240528, 0089_MW225_240528	**28-May-2024**	**----**	----	**----**	**31-May-2024**	04-Jun-2024	✓
EP231A: Perfluoroalkyl Sulfonic Acids							
HDPE (no PTFE) (EP231X)							
0089_MW217_240528, 0089_MW220_240528, 0089_MW216_240528, 0089_MW256_240528, 0089_MW258_240528	**28-May-2024**	**05-Jun-2024**	24-Nov-2024	✓	**05-Jun-2024**	24-Nov-2024	✓
HDPE (no PTFE) (EP231X)							
0089_MW224_240528, 0089_MW225_240528, 0089_MW215_240528, 0089_MW214_240528, 0089_MW255_240528, 0089_MW257_240528, 0089_MW259_240528, 0089_QC301_240528, 0089_QC302_240528, 0089_QC303_240528, 0089_QC401_240528, 0089_QC402_240528, 0089_QC403_240528	**28-May-2024**	**05-Jun-2024**	24-Nov-2024	✓	**06-Jun-2024**	24-Nov-2024	✓
EP231B: Perfluoroalkyl Carboxylic Acids							
HDPE (no PTFE) (EP231X)							
0089_MW217_240528, 0089_MW220_240528, 0089_MW216_240528, 0089_MW256_240528, 0089_MW258_240528	**28-May-2024**	**05-Jun-2024**	24-Nov-2024	✓	**05-Jun-2024**	24-Nov-2024	✓
HDPE (no PTFE) (EP231X)							
0089_MW224_240528, 0089_MW225_240528, 0089_MW215_240528, 0089_MW214_240528, 0089_MW255_240528, 0089_MW257_240528, 0089_MW259_240528, 0089_QC301_240528, 0089_QC302_240528, 0089_QC303_240528, 0089_QC401_240528, 0089_QC402_240528, 0089_QC403_240528	**28-May-2024**	**05-Jun-2024**	24-Nov-2024	✓	**06-Jun-2024**	24-Nov-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) 0089_MW217_240528, 0089_MW220_240528, 0089_MW216_240528, 0089_MW256_240528, 0089_MW258_240528	**28-May-2024**	**05-Jun-2024**	24-Nov-2024	✓	**05-Jun-2024**	24-Nov-2024	✓
HDPE (no PTFE) (EP231X) 0089_MW224_240528, 0089_MW225_240528, 0089_MW215_240528, 0089_MW214_240528, 0089_MW255_240528, 0089_MW257_240528, 0089_MW259_240528, 0089_QC301_240528, 0089_QC302_240528, 0089_QC303_240528, 0089_QC401_240528, 0089_QC402_240528, 0089_QC403_240528	**28-May-2024**	**05-Jun-2024**	24-Nov-2024	✓	**06-Jun-2024**	24-Nov-2024	✓
EP231D: (n:2) Fluorotelomer Sulfonic Acids							
HDPE (no PTFE) (EP231X) 0089_MW217_240528, 0089_MW220_240528, 0089_MW216_240528, 0089_MW256_240528, 0089_MW258_240528	**28-May-2024**	**05-Jun-2024**	24-Nov-2024	✓	**05-Jun-2024**	24-Nov-2024	✓
HDPE (no PTFE) (EP231X) 0089_MW224_240528, 0089_MW225_240528, 0089_MW215_240528, 0089_MW214_240528, 0089_MW255_240528, 0089_MW257_240528, 0089_MW259_240528, 0089_QC301_240528, 0089_QC302_240528, 0089_QC303_240528, 0089_QC401_240528, 0089_QC402_240528, 0089_QC403_240528	**28-May-2024**	**05-Jun-2024**	24-Nov-2024	✓	**06-Jun-2024**	24-Nov-2024	✓
EP231P: PFAS Sums							
HDPE (no PTFE) (EP231X) 0089_MW217_240528, 0089_MW220_240528, 0089_MW216_240528, 0089_MW256_240528, 0089_MW258_240528	**28-May-2024**	**05-Jun-2024**	24-Nov-2024	✓	**05-Jun-2024**	24-Nov-2024	✓
HDPE (no PTFE) (EP231X) 0089_MW224_240528, 0089_MW225_240528, 0089_MW215_240528, 0089_MW214_240528, 0089_MW255_240528, 0089_MW257_240528, 0089_MW259_240528, 0089_QC301_240528, 0089_QC302_240528, 0089_QC303_240528, 0089_QC401_240528, 0089_QC402_240528, 0089_QC403_240528	**28-May-2024**	**05-Jun-2024**	24-Nov-2024	✓	**06-Jun-2024**	24-Nov-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)							
Alkalinity by Auto Titrator	ED037-P	6	53	**11.32**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	8	68	**11.76**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	4	40	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Alkalinity by Auto Titrator	ED037-P	6	53	**11.32**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	4	68	**5.88**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	40	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Alkalinity by Auto Titrator	ED037-P	3	53	**5.66**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	4	68	**5.88**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	40	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Chloride by Discrete Analyser	ED045G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	40	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	20	**5.00**	**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
Alkalinity by Auto Titrator	ED037-P	WATER	In house: Referenced to APHA 2320 B This procedure determines alkalinity by automated measurement (e.g. PC Titrate) on a settled supernatant aliquot of the sample using pH 4.5 for indicating the total alkalinity end-point. This method is compliant with NEPM Schedule B(3)
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	WATER	In house: Referenced to APHA 4500-SO4. Dissolved sulfate is determined in a 0.45um filtered sample. Sulfate ions are converted to a barium sulfate suspension in an acetic acid medium with barium chloride. Light absorbance of the BaSO4 suspension is measured by a photometer and the SO4-2 concentration is determined by comparison of the reading with a standard curve. This method is compliant with NEPM Schedule B(3)
Chloride by Discrete Analyser	ED045G	WATER	In house: Referenced to APHA 4500 Cl - G.The thiocyanate ion is liberated from mercuric thiocyanate through sequestration of mercury by the chloride ion to form non-ionised mercuric chloride. In the presence of ferric ions the liberated thiocynate forms highly-coloured ferric thiocynate which is measured at 480 nm.
Major Cations - Dissolved	ED093F	WATER	In house: Referenced to APHA 3120 and 3125; USEPA SW 846 - 6010 and 6020; Cations are determined by either ICP-AES or ICP-MS techniques. This method is compliant with NEPM Schedule B(3) Sodium Adsorption Ratio is calculated from Ca, Mg and Na which determined by ALS in house method QWI-EN/ED093F. This method is compliant with NEPM Schedule B(3) Hardness parameters are calculated based on APHA 2340 B. This method is compliant with NEPM Schedule B(3)
Ionic Balance by PCT DA and Turbi SO4 DA	* EN055 - PG	WATER	In house: Referenced to APHA 1030F. This method is compliant with NEPM Schedule B(3)
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.

ALSCompass
SAMPLING *Intelligence*

ALS

Environmental Division
Perth
Work Order Reference
EP2407411

Telephone +61-8-9406 1301

Custody Document for Submissions via ALS Compass App

Project: WA-0089-PEASOUP_24 Client: STANTEC

Project Manager: [redacted]

Phone: ( )

ALS Compass COC Reference: 68276 68293 68221 68274 68275 68271

Samples: 68266 68272 68267

Sampler: [redacted]

Phone: ( )

Turnaround Requirements: (Standard) _____ Urgent _____

Special Instructions:

Custody:

Relinquished by: STANTEC	Received by: [redacted]	Relinquished by:	Received by:
Date / Time: 24/5/24 4 pm	Date / Time: 24/5 1230	Date / Time:	Date / Time:

CHAIN OF CUSTODY

ALS COC#: 68266 *ALS Laboratory:* EP Perth Environmental

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

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP_24

SITE: Stirling GW - JS

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER:

CONTACT PH: [redacted]

QUOTE NO: SY/139/19 B

SAMPLER MOBILE: [redacted] / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]derp.labreports@esdat.com.au

EMAIL INVOICES 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	WA OMP Water Suite WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
001	0089_MW228		28/05/2024 08:19 AM	WATER	ALS: 3 Non ALS: 0	No	X		
002	0089_QC106		28/05/2024 08:20 AM	WATER	ALS: 3 Non ALS: 0	No	X		
003	0089_MW227		28/05/2024 09:14 AM	WATER	ALS: 3 Non ALS: 0	No	X		
004	0089_MW226		28/05/2024 10:18 AM	WATER	ALS: 5 Non ALS: 0	No	X		
005	0089_MW268		28/05/2024 12:02 PM	WATER	ALS: 5 Non ALS: 0	No	X		
006	0089_MW288		28/05/2024 01:13 PM	WATER	ALS: 3 Non ALS: 0	No	X		

Wednesday, May 29, 2024 7:55:04 AM

CHAIN OF CUSTODY

COC#: **68266** *ALS Laboratory:* EP Perth Environmental

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

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP_24

SITE: Stirling GW - JS

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]derp.labreports@esdat.com.au

EMAIL INVOICES 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	0089_MW228	Clear Plastic Bottle - Natural	125 mL	00071121129615	Green	No	
001	0089_MW228	HDPE (no PTFE)	20 mL	00350822082148	Grey	No	
001	0089_MW228	HDPE (no PTFE)	20 mL	00350822082090	Grey	No	
002	0089_QC106	Clear Plastic Bottle - Natural	125 mL	00071121181938	Green	No	
002	0089_QC106	HDPE (no PTFE)	20 mL	00352312011901	Grey	No	
002	0089_QC106	HDPE (no PTFE)	20 mL	00352312011899	Grey	No	
003	0089_MW227	Clear Plastic Bottle - Natural	125 mL	00070522075381	Green	No	
003	0089_MW227	HDPE (no PTFE)	20 mL	00351221020886	Grey	No	
003	0089_MW227	HDPE (no PTFE)	20 mL	00351221020976	Grey	No	
004	0089_MW226	Clear Plastic Bottle - Natural	125 mL	00071121178109	Green	No	
004	0089_MW226	HDPE (no PTFE)	20 mL	00351221024741	Grey	No	
004	0089_MW226	HDPE (no PTFE)	20 mL	00352312048521	Grey	No	
004	0089_MW226	HDPE (no PTFE)	20 mL	00352312004176	Grey	No	
004	0089_MW226	HDPE (no PTFE)	20 mL	00352312003919	Grey	No	
005	0089_MW268	Clear Plastic Bottle - Natural	125 mL	00070522145035	Green	No	
005	0089_MW268	HDPE (no PTFE)	20 mL	00350821001683	Grey	No	
005	0089_MW268	HDPE (no PTFE)	20 mL	00350821001680	Grey	No	
005	0089_MW268	HDPE (no PTFE)	20 mL	00350821001737	Grey	No	
005	0089_MW268	HDPE (no PTFE)	20 mL	00350821001698	Grey	No	
006	0089_MW288	HDPE (no PTFE)	20 mL	00350522062442	Grey	No	
006	0089_MW288	HDPE (no PTFE)	20 mL	00350522042848	Grey	No	
006	0089_MW288	Clear Plastic Bottle - Natural	125 mL	00070522144973	Green	No	

Total Bottle Count: ALS: 22, Non ALS: 0

SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : **EP2407411**

Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: [redacted]
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
E-mail	: [redacted]stantec.com	E-mail	: [redacted]alsglobal.com
Telephone	: ----	Telephone	: +61-8-9406 1301
Facsimile	: ----	Facsimile	: +61-8-9406 1399
Project	: WA_0089_PFASOMP_24	Page	: 1 of 2
Order number	: pfas-omp/Stirling	Quote number	: ES2022MWHAUS0002 (SY/139/19 B)
C-O-C number	: 68266	QC Level	: NEPM 2013 B3 & ALS QC Standard
Site	: Stirling GW - JS		
Sampler	: [redacted]		

Dates

Date Samples Received	: 29-May-2024 12:30	Issue Date	: 31-May-2024
Client Requested Due Date	: 11-Jun-2024	Scheduled Reporting Date	: **11-Jun-2024**

Delivery Details

Mode of Delivery	: Carrier	Security Seal	: Not Available
No. of coolers/boxes	: 2	Temperature	: 14.1 - Ice present
Receipt Detail	:	No. of samples received / analysed	: 6 / 6

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 see scanned COC for sample discrepencies: extra samples , samples not received etc.
- Please direct any queries related to sample condition / numbering / breakages to Sample Receipt (Samples.Perth@alsglobal.com)
- Analytical work for this work order will be conducted at ALS Environmental Perth.
- Please direct any turnaround / technical queries to the laboratory contact designated above.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months) from receipt of samples.
- **pH analysis should be conducted within 6 hours of sampling.**
- **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.**
- 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 (30 analytes)	WATER - NT-01 & 02 Ca, Mg, Na, K, Cl, SO4, Alkalinity
EP2407411-001	28-May-2024 08:19	0089_MW228_240528	✓	✓
EP2407411-002	28-May-2024 08:20	0089_QC106_240528	✓	✓
EP2407411-003	28-May-2024 09:14	0089_MW227_240528	✓	✓
EP2407411-004	28-May-2024 10:18	0089_MW226_240528	✓	✓
EP2407411-005	28-May-2024 12:02	0089_MW268_240528	✓	✓
EP2407411-006	28-May-2024 13:13	0089_MW288_240528	✓	✓

Proactive Holding Time Report

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

Requested Deliverables

[redacted]
- A4 - AU Tax Invoice (INV) — Email — [redacted]cardno.com.au

DERP LAB REPORTS
- EDI Format - ESDAT (ESDAT) — Email — derp.labreports@esdat.com.au

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

CERTIFICATE OF ANALYSIS

Work Order	: **EP2407411**	Page	: 1 of 9
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: [redacted]
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: +61-8-9406 1301
Project	: WA_0089_PFASOMP_24	Date Samples Received	: 29-May-2024 12:30
Order number	: pfas-omp/Stirling	Date Analysis Commenced	: 31-May-2024
C-O-C number	: 68266	Issue Date	: 10-Jun-2024 17:28
Sampler	: [redacted] [redacted]		
Site	: Stirling GW - JS		
Quote number	: SY/139/19 B		
No. of samples received	: 6		
No. of samples analysed	: 6		

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]	Laboratory Manager (Perth)	Perth Inorganics, Wangara, WA
[redacted]	Senior Organic Chemist	Perth Organics, Wangara, WA

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.
- As per QWI – EN55-3 Data Interpreting Procedures, Ionic balances are typically calculated using Major Anions - Chloride, Alkalinity and Sulfate; and Major Cations - Calcium, Magnesium, Potassium and Sodium. Where applicable and dependent upon sample matrix, the Ionic Balance may also include the additional contribution of Ammonia, Dissolved Metals by ICPMS and H+ to the Cations and Nitrate, SiO2 and Fluoride to the Anions.
- Sodium Adsorption Ratio (where reported): Where results for Na, Ca or Mg are <LOR, a concentration at half the reported LOR is incorporated into the SAR calculation. This represents a conservative approach for Na relative to the assumption that <LOR = zero concentration and a conservative approach for Ca & Mg relative to the assumption that <LOR is equivalent to the LOR concentration.
- 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.
- ED045G: The presence of Thiocyanate, Thiosulfate and Sulfite can positively contribute to the chloride result, thereby may bias results higher than expected. Results should be scrutinised accordingly.

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW228_240528	0089_QC106_240528	0089_MW227_240528	0089_MW226_240528	0089_MW268_240528
				Sampling date / time	28-May-2024 08:19	28-May-2024 08:20	28-May-2024 09:14	28-May-2024 10:18	28-May-2024 12:02
Compound	CAS Number	LOR	Unit		EP2407411-001	EP2407411-002	EP2407411-003	EP2407411-004	EP2407411-005
					Result	Result	Result	Result	Result
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	<1	<1	<1	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	<1	<1	<1	<1
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		603	706	792	672	402
Total Alkalinity as CaCO3	----	1	mg/L		603	706	792	672	402
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		1010	974	163	2070	1050
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		5980	5570	740	14800	5700
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		211	195	145	434	286
Magnesium	7439-95-4	1	mg/L		533	489	124	1160	497
Sodium	7440-23-5	1	mg/L		3630	3210	582	8220	3500
Potassium	7440-09-7	1	mg/L		183	166	31	492	170
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		202	192	40.1	474	191
ø Total Cations	----	0.01	meq/L		217	194	43.5	487	212
ø Ionic Balance	----	0.01	%		3.63	0.61	4.13	1.38	5.24
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		0.28	0.32	<0.02	<0.02	0.07
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		0.22	0.25	<0.02	<0.02	0.06
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		0.52	0.57	<0.01	<0.01	0.25
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

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW228_240528	0089_QC106_240528	0089_MW227_240528	0089_MW226_240528	0089_MW268_240528
				Sampling date / time	28-May-2024 08:19	28-May-2024 08:20	28-May-2024 09:14	28-May-2024 10:18	28-May-2024 12:02
Compound	CAS Number	LOR	Unit		EP2407411-001	EP2407411-002	EP2407411-003	EP2407411-004	EP2407411-005
					Result	Result	Result	Result	Result
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		**1.1**	**1.3**	<0.1	<0.1	<0.1
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		**4.75**	**5.52**	<0.02	<0.02	<0.02
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		**4.38**	**4.80**	<0.02	<0.02	**0.03**
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		**1.14**	**1.26**	<0.02	<0.02	<0.02
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		**0.25**	**0.29**	<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
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									

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW228_240528	0089_QC106_240528	0089_MW227_240528	0089_MW226_240528	0089_MW268_240528
				Sampling date / time	28-May-2024 08:19	28-May-2024 08:20	28-May-2024 09:14	28-May-2024 10:18	28-May-2024 12:02
Compound	CAS Number	LOR	Unit		EP2407411-001	EP2407411-002	EP2407411-003	EP2407411-004	EP2407411-005
					Result	Result	Result	Result	Result
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
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		**0.59**	**0.72**	<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		**13.2**	**15.0**	<0.01	<0.01	**0.41**
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		**0.52**	**0.57**	<0.01	<0.01	**0.25**
Sum of PFAS (WA DER List)	----	0.01	µg/L		**13.0**	**14.8**	<0.01	<0.01	**0.35**
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**104**	**105**	**101**	**102**	**99.2**
13C8-PFOA	----	0.02	%		**110**	**107**	**99.6**	**102**	**104**

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW288_240528	----	----	----	----
				Sampling date / time	28-May-2024 13:13	----	----	----	----
Compound	CAS Number	LOR	Unit		EP2407411-006	--------	--------	--------	--------
					Result	----	----	----	----
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	----	----	----	----
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	----	----	----	----
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		**293**	----	----	----	----
Total Alkalinity as CaCO3	----	1	mg/L		**293**	----	----	----	----
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		**65**	----	----	----	----
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		**63**	----	----	----	----
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		**97**	----	----	----	----
Magnesium	7439-95-4	1	mg/L		**24**	----	----	----	----
Sodium	7440-23-5	1	mg/L		**60**	----	----	----	----
Potassium	7440-09-7	1	mg/L		**7**	----	----	----	----
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		**8.98**	----	----	----	----
ø Total Cations	----	0.01	meq/L		**9.60**	----	----	----	----
ø Ionic Balance	----	0.01	%		**3.33**	----	----	----	----
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		**0.07**	----	----	----	----
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		<0.02	----	----	----	----
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		**1.20**	----	----	----	----
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	----	----	----	----

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW288_240528	----	----	----	----
				Sampling date / time	28-May-2024 13:13	----	----	----	----
Compound	CAS Number	LOR	Unit		EP2407411-006	--------	--------	--------	--------
					Result	----	----	----	----
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	----	----	----	----
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									

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW288_240528	----	----	----	----
				Sampling date / time	28-May-2024 13:13	----	----	----	----
Compound	CAS Number	LOR	Unit		EP2407411-006	--------	--------	--------	--------
					Result	----	----	----	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
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		**1.28**	----	----	----	----
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		**1.27**	----	----	----	----
Sum of PFAS (WA DER List)	----	0.01	µg/L		**1.28**	----	----	----	----
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**98.9**	----	----	----	----
13C8-PFOA	----	0.02	%		**99.0**	----	----	----	----

Surrogate Control Limits

Sub-Matrix: **GROUNDWATER**		Recovery Limits (%)	
Compound	*CAS Number*	*Low*	*High*
EP231S: PFAS Surrogate			
13C4-PFOS	----	65	140
13C8-PFOA	----	71	133

QUALITY CONTROL REPORT

Work Order	: **EP2407411**	Page	: 1 of 13
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: [redacted]
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: +61-8-9406 1301
Project	: WA_0089_PFASOMP_24	Date Samples Received	: 29-May-2024
Order number	: pfas-omp/Stirling	Date Analysis Commenced	: 31-May-2024
C-O-C number	: 68266	Issue Date	: 10-Jun-2024
Sampler	: [redacted] [redacted]		
Site	: Stirling GW - JS		
Quote number	: SY/139/19 B		
No. of samples received	: 6		
No. of samples analysed	: 6		

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]	Laboratory Manager (Perth)	Perth Inorganics, Wangara, WA
[redacted]	Senior Organic Chemist	Perth Organics, Wangara, WA

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 (%)
ED037P: Alkalinity by PC Titrator (QC Lot: 5837282)									
EP2407411-002	0089_QC106_240528	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	706	703	0.3	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	706	703	0.3	0% - 20%
EP2407417-005	Anonymous	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	465	465	0.0	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	465	465	0.0	0% - 20%
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QC Lot: 5829562)									
EP2407452-005	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	36	36	0.0	0% - 20%
EP2407411-001	0089_MW228_240528	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	1010	1050	3.3	0% - 20%
ED045G: Chloride by Discrete Analyser (QC Lot: 5829563)									
EP2407470-011	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	<1	<1	0.0	No Limit
EP2407411-001	0089_MW228_240528	ED045G: Chloride	16887-00-6	1	mg/L	5980	5980	0.1	0% - 20%
ED093F: Dissolved Major Cations (QC Lot: 5833495)									
EP2407411-001	0089_MW228_240528	ED093F: Calcium	7440-70-2	1	mg/L	211	210	0.0	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	533	531	0.5	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	3630	3600	0.7	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	183	183	0.0	0% - 20%
EP2407417-005	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	86	85	1.6	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	43	41	4.1	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	167	168	0.6	0% - 20%

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 (%)
ED093F: Dissolved Major Cations (QC Lot: 5833495) - continued									
EP2407417-005	Anonymous	ED093F: Potassium	7440-09-7	1	mg/L	17	17	0.0	0% - 50%
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 5835276)									
EP2407413-004	Anonymous	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
EP2407413-015	Anonymous	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	0.04	0.02	67.4	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: 5835294)									
EP2407384-004	Anonymous	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
EP2407384-013	Anonymous	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
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 5835276)									
EP2407413-004	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

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: 5835276) - continued									
EP2407413-004	Anonymous	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
EP2407413-015	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
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 5835294)									
EP2407384-004	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
EP2407384-013	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: 5835276)									

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: 5835276) - continued									
EP2407413-004	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
EP2407413-015	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
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 5835294)									
EP2407384-004	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
EP2407384-013	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: 5835294) - continued									
EP2407384-013	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: 5835276)									
EP2407413-004	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
EP2407413-015	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
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 5835294)									
EP2407384-004	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
EP2407384-013	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

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 (%)
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 5835294) - continued									
EP2407384-013	Anonymous	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: 5835276)									
EP2407413-004	Anonymous	EP231X: Sum of PFAS	----	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	<0.01	<0.01	0.0	No Limit
EP2407413-015	Anonymous	EP231X: Sum of PFAS	----	0.01	µg/L	0.04	0.02	66.7	No Limit
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	0.04	0.02	66.7	No Limit
		EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	0.04	0.02	66.7	No Limit
EP231P: PFAS Sums (QC Lot: 5835294)									
EP2407384-004	Anonymous	EP231X: Sum of PFAS	----	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	<0.01	<0.01	0.0	No Limit
EP2407384-013	Anonymous	EP231X: Sum of PFAS	----	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	<0.01	<0.01	0.0	No Limit

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
ED037P: Alkalinity by PC Titrator (QCLot: 5837282)								
ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	----	----	----	----
ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	----	----	----	----
ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	<1	----	----	----	----
ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	<1	20 mg/L	100	85.1	126
				<1	200 mg/L	100	90.5	111
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 5829562)								
ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<1	25 mg/L	104	89.9	112
				<1	500 mg/L	101	89.9	112
ED045G: Chloride by Discrete Analyser (QCLot: 5829563)								
ED045G: Chloride	16887-00-6	1	mg/L	<1	10 mg/L	103	88.6	113
				<1	1000 mg/L	96.5	88.6	113
ED093F: Dissolved Major Cations (QCLot: 5833495)								
ED093F: Calcium	7440-70-2	1	mg/L	<1	50 mg/L	101	86.5	117
ED093F: Magnesium	7439-95-4	1	mg/L	<1	50 mg/L	99.1	88.4	110
ED093F: Sodium	7440-23-5	1	mg/L	<1	50 mg/L	98.2	91.4	113
ED093F: Potassium	7440-09-7	1	mg/L	<1	50 mg/L	95.1	84.6	108
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5835276)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.2218 µg/L	96.0	72.0	130
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.2352 µg/L	108	71.0	127
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	0.2373 µg/L	97.3	68.0	131
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.238 µg/L	101	69.0	134
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.232 µg/L	97.8	65.0	140
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.241 µg/L	91.7	53.0	142
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5835294)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.2218 µg/L	97.4	72.0	130
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.2352 µg/L	83.5	71.0	127
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	0.2373 µg/L	93.6	68.0	131
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.238 µg/L	105	69.0	134
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.232 µg/L	97.6	65.0	140
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.241 µg/L	101	53.0	142

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: 5835276)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	1.25 µg/L	103	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	99.2	72.0	129
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	0.25 µg/L	103	72.0	130
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	0.25 µg/L	97.4	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	97.8	71.0	129
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	0.25 µg/L	103	69.0	133
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	0.25 µg/L	101	72.0	134
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	0.25 µg/L	110	65.0	144
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	0.25 µg/L	106	71.0	132
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5835294)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	1.25 µg/L	97.2	73.0	129
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	0.25 µg/L	104	72.0	129
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	0.25 µg/L	111	72.0	129
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	0.25 µg/L	101	72.0	130
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	0.25 µg/L	96.6	71.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	0.25 µg/L	96.4	69.0	130
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	0.25 µg/L	97.0	71.0	129
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	0.25 µg/L	105	69.0	133
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	0.25 µg/L	102	72.0	134
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	0.25 µg/L	95.2	65.0	144
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	0.25 µg/L	100	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5835276)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.25 µg/L	105	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	0.625 µg/L	108	68.0	141
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	0.625 µg/L	98.4	60.5	138
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	0.625 µg/L	104	68.3	134
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	0.625 µg/L	112	62.2	138
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	0.25 µg/L	102	65.0	136
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	0.25 µg/L	104	61.0	135

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
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5835294)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.25 µg/L	96.6	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	0.625 µg/L	97.3	68.0	141
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	0.625 µg/L	102	60.5	138
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	0.625 µg/L	112	68.3	134
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	0.625 µg/L	93.6	62.2	138
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	0.25 µg/L	111	65.0	136
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	0.25 µg/L	99.4	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5835276)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.2343 µg/L	108	63.0	143
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	0.2378 µg/L	109	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	0.24 µg/L	110	67.0	138
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	0.241 µg/L	113	64.2	133
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5835294)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.2343 µg/L	111	63.0	143
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	0.2378 µg/L	105	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	0.24 µg/L	115	67.0	138
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	0.241 µg/L	98.5	64.2	133
EP231P: PFAS Sums (QCLot: 5835276)								
EP231X: Sum of PFAS	----	0.01	µg/L	<0.01	----	----	----	----
EP231X: Sum of PFHxS and PFOS	355-46-4/17 63-23-1	0.01	µg/L	<0.01	----	----	----	----
EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	<0.01	----	----	----	----
EP231P: PFAS Sums (QCLot: 5835294)								
EP231X: Sum of PFAS	----	0.01	µg/L	<0.01	----	----	----	----
EP231X: Sum of PFHxS and PFOS	355-46-4/17 63-23-1	0.01	µg/L	<0.01	----	----	----	----
EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	<0.01	----	----	----	----

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**

Matrix Spike (MS) Report

Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*Concentration*	*MS*	*Low*	*High*
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 5829562)							
EP2407411-001	0089_MW228_240528	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	100 mg/L	# Not Determined	70.4	130
ED045G: Chloride by Discrete Analyser (QCLot: 5829563)							
EP2407411-001	0089_MW228_240528	ED045G: Chloride	16887-00-6	200 mg/L	# Not Determined	70.0	130
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5835276)							
EP2407413-014	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.2218 µg/L	93.7	72.0	129
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.232 µg/L	98.9	71.0	127
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.2352 µg/L	89.6	68.0	129
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.238 µg/L	101	69.0	134
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.232 µg/L	90.4	65.0	140
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.241 µg/L	85.7	53.0	129
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5835294)							
EP2407384-009	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.2218 µg/L	82.9	72.0	129
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.232 µg/L	78.6	71.0	127
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.2352 µg/L	# Not Determined	68.0	129
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.238 µg/L	127	69.0	134
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.232 µg/L	92.4	65.0	140
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.241 µg/L	100	53.0	129
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5835276)							
EP2407413-014	Anonymous	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	1.25 µg/L	101	73.0	142
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.25 µg/L	100	72.0	129
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.25 µg/L	105	72.0	129
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.25 µg/L	102	72.0	130
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.25 µg/L	100	71.0	133
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.25 µg/L	99.2	69.0	130
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.25 µg/L	98.4	71.0	134
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.25 µg/L	102	69.0	133
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.25 µg/L	106	72.0	134
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.25 µg/L	121	65.0	144
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.25 µg/L	100	71.0	132
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5835294)							
EP2407384-009	Anonymous	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	1.25 µg/L	92.7	73.0	142
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.25 µg/L	87.4	72.0	129
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.25 µg/L	109	72.0	129
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.25 µg/L	82.8	72.0	130
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.25 µg/L	93.2	71.0	133

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: 5835294) - continued							
EP2407384-009	Anonymous	EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.25 µg/L	92.7	69.0	130
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.25 µg/L	88.7	71.0	134
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.25 µg/L	97.8	69.0	133
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.25 µg/L	98.7	72.0	134
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.25 µg/L	87.3	65.0	144
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.25 µg/L	88.7	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5835276)							
EP2407413-014	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.25 µg/L	101	59.0	135
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.625 µg/L	110	70.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.625 µg/L	105	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.625 µg/L	109	70.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.625 µg/L	106	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.25 µg/L	90.0	65.0	136
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.25 µg/L	93.9	61.0	135
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5835294)							
EP2407384-009	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.25 µg/L	94.2	59.0	135
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.625 µg/L	110	70.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.625 µg/L	91.3	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.625 µg/L	109	70.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.625 µg/L	113	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.25 µg/L	102	65.0	136
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.25 µg/L	94.5	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5835276)							
EP2407413-014	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.234 µg/L	98.9	63.0	143
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.2378 µg/L	114	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.24 µg/L	98.8	67.0	138
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.2415 µg/L	92.6	70.0	130
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5835294)							

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: 5835294) - continued							
EP2407384-009	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.234 µg/L	97.2	63.0	143
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.2378 µg/L	98.2	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.24 µg/L	92.0	67.0	138
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.2415 µg/L	93.2	70.0	130

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **EP2407411**	Page	: 1 of 5
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Telephone	: +61-8-9406 1301
Project	: WA_0089_PFASOMP_24	Date Samples Received	: 29-May-2024
Site	: Stirling GW - JS	Issue Date	: 10-Jun-2024
Sampler	: [redacted] [redacted]	No. of samples received	: 6
Order number	: pfas-omp/Stirling	No. of samples analysed	: 6

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.**
- **Matrix Spike outliers exist - please see following pages for full details.**
- **For all regular sample matrices, where applicable to the methodology, 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.**

Outliers : Quality Control Samples

Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

Matrix: **WATER**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
Matrix Spike (MS) Recoveries							
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA	EP2407411--001	0089_MW228_240528	**Sulfate as SO4 - Turbidimetric**	14808-79-8	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
ED045G: Chloride by Discrete Analyser	EP2407411--001	0089_MW228_240528	**Chloride**	16887-00-6	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
EP231A: Perfluoroalkyl Sulfonic Acids	EP2407384--009	Anonymous	**Perfluorohexane sulfonic acid (PFHxS)**	355-46-4	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**

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
ED037P: Alkalinity by PC Titrator								
Clear Plastic Bottle - Natural (ED037-P)								
0089_MW228_240528,	0089_QC106_240528,	**28-May-2024**	**----**	----	**----**	**05-Jun-2024**	11-Jun-2024	✓
0089_MW227_240528,	0089_MW226_240528,							
0089_MW268_240528,	0089_MW288_240528							
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA								
Clear Plastic Bottle - Natural (ED041G)								
0089_MW228_240528,	0089_QC106_240528,	**28-May-2024**	**----**	----	**----**	**10-Jun-2024**	25-Jun-2024	✓
0089_MW227_240528,	0089_MW226_240528,							
0089_MW268_240528,	0089_MW288_240528							
ED045G: Chloride by Discrete Analyser								
Clear Plastic Bottle - Natural (ED045G)								
0089_MW228_240528,	0089_QC106_240528,	**28-May-2024**	**----**	----	**----**	**10-Jun-2024**	25-Jun-2024	✓
0089_MW227_240528,	0089_MW226_240528,							
0089_MW268_240528,	0089_MW288_240528							

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
ED093F: Dissolved Major Cations								
Clear Plastic Bottle - Natural (ED093F)								
0089_MW228_240528,	0089_QC106_240528,	**28-May-2024**	**----**	----	**----**	**04-Jun-2024**	04-Jun-2024	✓
0089_MW227_240528,	0089_MW226_240528,							
0089_MW268_240528,	0089_MW288_240528							
EP231A: Perfluoroalkyl Sulfonic Acids								
HDPE (no PTFE) (EP231X)								
0089_MW228_240528,	0089_QC106_240528	**28-May-2024**	**05-Jun-2024**	24-Nov-2024	✓	**05-Jun-2024**	24-Nov-2024	✓
HDPE (no PTFE) (EP231X)								
0089_MW227_240528,	0089_MW226_240528,	**28-May-2024**	**05-Jun-2024**	24-Nov-2024	✓	**06-Jun-2024**	24-Nov-2024	✓
0089_MW268_240528,	0089_MW288_240528							
EP231B: Perfluoroalkyl Carboxylic Acids								
HDPE (no PTFE) (EP231X)								
0089_MW228_240528,	0089_QC106_240528	**28-May-2024**	**05-Jun-2024**	24-Nov-2024	✓	**05-Jun-2024**	24-Nov-2024	✓
HDPE (no PTFE) (EP231X)								
0089_MW227_240528,	0089_MW226_240528,	**28-May-2024**	**05-Jun-2024**	24-Nov-2024	✓	**06-Jun-2024**	24-Nov-2024	✓
0089_MW268_240528,	0089_MW288_240528							
EP231C: Perfluoroalkyl Sulfonamides								
HDPE (no PTFE) (EP231X)								
0089_MW228_240528,	0089_QC106_240528	**28-May-2024**	**05-Jun-2024**	24-Nov-2024	✓	**05-Jun-2024**	24-Nov-2024	✓
HDPE (no PTFE) (EP231X)								
0089_MW227_240528,	0089_MW226_240528,	**28-May-2024**	**05-Jun-2024**	24-Nov-2024	✓	**06-Jun-2024**	24-Nov-2024	✓
0089_MW268_240528,	0089_MW288_240528							
EP231D: (n:2) Fluorotelomer Sulfonic Acids								
HDPE (no PTFE) (EP231X)								
0089_MW228_240528,	0089_QC106_240528	**28-May-2024**	**05-Jun-2024**	24-Nov-2024	✓	**05-Jun-2024**	24-Nov-2024	✓
HDPE (no PTFE) (EP231X)								
0089_MW227_240528,	0089_MW226_240528,	**28-May-2024**	**05-Jun-2024**	24-Nov-2024	✓	**06-Jun-2024**	24-Nov-2024	✓
0089_MW268_240528,	0089_MW288_240528							
EP231P: PFAS Sums								
HDPE (no PTFE) (EP231X)								
0089_MW228_240528,	0089_QC106_240528	**28-May-2024**	**05-Jun-2024**	24-Nov-2024	✓	**05-Jun-2024**	24-Nov-2024	✓
HDPE (no PTFE) (EP231X)								
0089_MW227_240528,	0089_MW226_240528,	**28-May-2024**	**05-Jun-2024**	24-Nov-2024	✓	**06-Jun-2024**	24-Nov-2024	✓
0089_MW268_240528,	0089_MW288_240528							

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)							
Alkalinity by Auto Titrator	ED037-P	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	12	**16.67**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	4	40	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Alkalinity by Auto Titrator	ED037-P	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	12	**16.67**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	40	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Alkalinity by Auto Titrator	ED037-P	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	1	12	**8.33**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	40	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Chloride by Discrete Analyser	ED045G	1	12	**8.33**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	40	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	20	**5.00**	**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
Alkalinity by Auto Titrator	ED037-P	WATER	In house: Referenced to APHA 2320 B This procedure determines alkalinity by automated measurement (e.g. PC Titrate) on a settled supernatant aliquot of the sample using pH 4.5 for indicating the total alkalinity end-point. This method is compliant with NEPM Schedule B(3)
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	WATER	In house: Referenced to APHA 4500-SO4. Dissolved sulfate is determined in a 0.45um filtered sample. Sulfate ions are converted to a barium sulfate suspension in an acetic acid medium with barium chloride. Light absorbance of the BaSO4 suspension is measured by a photometer and the SO4-2 concentration is determined by comparison of the reading with a standard curve. This method is compliant with NEPM Schedule B(3)
Chloride by Discrete Analyser	ED045G	WATER	In house: Referenced to APHA 4500 Cl - G.The thiocyanate ion is liberated from mercuric thiocyanate through sequestration of mercury by the chloride ion to form non-ionised mercuric chloride. In the presence of ferric ions the liberated thiocynate forms highly-coloured ferric thiocynate which is measured at 480 nm.
Major Cations - Dissolved	ED093F	WATER	In house: Referenced to APHA 3120 and 3125; USEPA SW 846 - 6010 and 6020; Cations are determined by either ICP-AES or ICP-MS techniques. This method is compliant with NEPM Schedule B(3) Sodium Adsorption Ratio is calculated from Ca, Mg and Na which determined by ALS in house method QWI-EN/ED093F. This method is compliant with NEPM Schedule B(3) Hardness parameters are calculated based on APHA 2340 B. This method is compliant with NEPM Schedule B(3)
Ionic Balance by PCT DA and Turbi SO4 DA	* EN055 - PG	WATER	In house: Referenced to APHA 1030F. This method is compliant with NEPM Schedule B(3)
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.

ALSCompass
SAMPLING *Intelligence*

ALS

Environmental Division
Perth
Work Order Reference
EP2407412

Telephone : +61-8-9406 1301

Custody Document for Submissions via ALS Compass App

Project: WA-0089-PFASOMP-24 Client: STANTEC Project Manager: [redacted]

Phone: ( )

ALS Compass COC Reference: 68276 # Samples: 68265 68272 68267 Sampler: [redacted]

Phone: ( )

Turnaround Requirements: (Standard) _____ Urgent _____

Special Instructions:

Custody:

Relinquished by: STANTEC	Received by: [redacted]	Relinquished by:	Received by:
Date / Time: 28/5/24 4 pm	Date / Time: 29/5 1230	Date / Time:	Date / Time:

CHAIN OF CUSTODY

COC#: 68275 *ALS Laboratory:* EP Perth Environmental

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

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP_24

SITE: Stirling SD - JS

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted] derp.labreports@esdat.com.au

EMAIL INVOICES 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 Sediments SEDIMENT	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
001	0089_SD405		28/05/2024 09:01 AM	SOIL	ALS: 1 Non ALS: 0	No	X		
002	0089_QC107		28/05/2024 09:02 AM	SOIL	ALS: 1 Non ALS: 0	No	X		
003	0089_SD407		28/05/2024 09:12 AM	SOIL	ALS: 1 Non ALS: 0	No	X		
004	0089_SD409		28/05/2024 10:20 AM	SOIL	ALS: 1 Non ALS: 0	No	X		
005	0089_SD378		28/05/2024 11:01 AM	SOIL	ALS: 1 Non ALS: 0	No	X		
006	0089_SD375		28/05/2024 11:02 AM	SOIL	ALS: 1 Non ALS: 0	No	X		
007	0089_SD374		28/05/2024 11:02 AM	SOIL	ALS: 1 Non ALS: 0	No	X		

CHAIN OF CUSTODY

COC#: 68275 *ALS Laboratory:* EP Perth Environmental

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

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP_24

SITE: Stirling SD - JS

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted] derp.labreports@esdat.com.au

EMAIL INVOICES 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 Sediments SEDIMENT	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
008	0089_SD346		28/05/2024 01:13 PM	SOIL	ALS: 1 Non ALS: 0	No	X		

CHAIN OF CUSTODY

COC#: 68275 *ALS Laboratory:* EP Perth Environmental

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP_24

SITE: Stirling SD - JS

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER:

CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted] derp.labreports@esdat.com.au

EMAIL INVOICES TO:

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

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	0089_SD405	HDPE Soil Jar	200 mL	00621122049113	Grey	No	
002	0089_QC107	HDPE Soil Jar	200 mL	00621122049061	Grey	No	
003	0089_SD407	HDPE Soil Jar	200 mL	00620322054980	Grey	No	
004	0089_SD409	HDPE Soil Jar	200 mL	00621122049077	Grey	No	
005	0089_SD378	HDPE Soil Jar	200 mL	00621122049053	Grey	No	
006	0089_SD375	HDPE Soil Jar	200 mL	00621122049048	Grey	No	
007	0089_SD374	HDPE Soil Jar	200 mL	00621122003393	Grey	No	
008	0089_SD346	HDPE Soil Jar	200 mL	00621222053658	Grey	No	

Total Bottle Count: ALS: 8, Non ALS: 0

SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : **EP2407412**

Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: [redacted]
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
E-mail	: [redacted]stantec.com	E-mail	: [redacted]alsglobal.com
Telephone	: ----	Telephone	: +61-8-9406 1301
Facsimile	: ----	Facsimile	: +61-8-9406 1399
Project	: WA_0089_PFASOMP_24	Page	: 1 of 2
Order number	: pfas-omp/Stirling	Quote number	: ES2022MWHAUS0002 (SY/139/19 B)
C-O-C number	: 68275	QC Level	: NEPM 2013 B3 & ALS QC Standard
Site	: Stirling SD - JS		
Sampler	: [redacted]		

Dates

Date Samples Received	: 29-May-2024 12:30	Issue Date	: 30-May-2024
Client Requested Due Date	: 10-Jun-2024	Scheduled Reporting Date	: **10-Jun-2024**

Delivery Details

Mode of Delivery	: Carrier	Security Seal	: Not Available
No. of coolers/boxes	: 2	Temperature	: 14.1 - Ice present
Receipt Detail	:	No. of samples received / analysed	: 8 / 8

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 see scanned COC for sample discrepencies: extra samples , samples not received etc.
- Please direct any queries related to sample condition / numbering / breakages to Sample Receipt (Samples.Perth@alsglobal.com)
- Analytical work for this work order will be conducted at ALS Environmental Perth.
- Please direct any turnaround / technical queries to the laboratory contact designated above.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months) from receipt of samples.
- **pH analysis should be conducted within 6 hours of sampling.**
- **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.**
- 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: **SOIL**

Laboratory sample ID	Sampling date / time	Sample ID	SOIL - EA055-103 Moisture Content	SOIL - EP231X (solids) PFAS - Full Suite (30 analytes)
EP2407412-001	28-May-2024 09:01	0089_SD405_240528	✓	✓
EP2407412-002	28-May-2024 09:02	0089_QC107_240528	✓	✓
EP2407412-003	28-May-2024 09:12	0089_SD407_240528	✓	✓
EP2407412-004	28-May-2024 10:20	0089_SD409_240528	✓	✓
EP2407412-005	28-May-2024 11:01	0089_SD378_240528	✓	✓
EP2407412-006	28-May-2024 11:02	0089_SD375_240528	✓	✓
EP2407412-007	28-May-2024 11:02	0089_SD374_240528	✓	✓
EP2407412-008	28-May-2024 13:13	0089_SD346_240528	✓	✓

Proactive Holding Time Report

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

Requested Deliverables

[redacted]
- A4 - AU Tax Invoice (INV) — Email — [redacted]cardno.com.au

DERP LAB REPORTS
- EDI Format - ESDAT (ESDAT) — Email — derp.labreports@esdat.com.au

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

CERTIFICATE OF ANALYSIS

Work Order	: **EP2407412**	Page	: 1 of 7
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: [redacted]
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: +61-8-9406 1301
Project	: WA_0089_PFASOMP_24	Date Samples Received	: 29-May-2024 12:30
Order number	: pfas-omp/Stirling	Date Analysis Commenced	: 05-Jun-2024
C-O-C number	: 68275	Issue Date	: 07-Jun-2024 16:15
Sampler	: [redacted] [redacted]		
Site	: Stirling SD - JS		
Quote number	: SY/139/19 B		
No. of samples received	: 8		
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]	Laboratory Manager (Perth)	Perth Inorganics, Wangara, WA
[redacted]	Senior Organic Chemist	Perth Organics, Wangara, WA

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.

- 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 USEPA 1633 limits 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: SEDIMENT (Matrix: SOIL)				Sample ID	0089_SD405_240528	0089_QC107_240528	0089_SD407_240528	0089_SD409_240528	0089_SD378_240528
				Sampling date / time	28-May-2024 09:01	28-May-2024 09:02	28-May-2024 09:12	28-May-2024 10:20	28-May-2024 11:01
Compound	CAS Number	LOR	Unit		EP2407412-001	EP2407412-002	EP2407412-003	EP2407412-004	EP2407412-005
					Result	Result	Result	Result	Result
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content	----	0.1	%		**24.8**	**21.6**	**26.3**	**26.9**	**18.6**
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg		<0.001	<0.001	<0.001	<0.001	<0.001
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002

Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)				Sample ID	0089_SD405_240528	0089_QC107_240528	0089_SD407_240528	0089_SD409_240528	0089_SD378_240528
				Sampling date / time	28-May-2024 09:01	28-May-2024 09:02	28-May-2024 09:12	28-May-2024 10:20	28-May-2024 11:01
Compound	CAS Number	LOR	Unit		EP2407412-001	EP2407412-002	EP2407412-003	EP2407412-004	EP2407412-005
					Result	Result	Result	Result	Result
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
EP231P: PFAS Sums									
Sum of PFAS	----	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Sum of PFAS (WA DER List)	----	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.0002	%		**104**	**97.0**	**99.5**	**91.0**	**106**
13C8-PFOA	----	0.0002	%		**102**	**105**	**99.0**	**102**	**104**

Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)				Sample ID	0089_SD375_240528	0089_SD374_240528	0089_SD346_240528	----	----
				Sampling date / time	28-May-2024 11:02	28-May-2024 11:02	28-May-2024 13:13	----	----
Compound	CAS Number	LOR	Unit		EP2407412-006	EP2407412-007	EP2407412-008	--------	--------
					Result	Result	Result	----	----
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content	----	0.1	%		**17.7**	**12.6**	**32.4**	**----**	**----**
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	**----**	**----**
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	**----**	**----**
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	**----**	**----**
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	**----**	**----**
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg		**0.0006**	**0.0005**	**0.0021**	**----**	**----**
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	**----**	**----**
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg		<0.001	<0.001	<0.001	**----**	**----**
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	**----**	**----**
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	**----**	**----**
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	**----**	**----**
Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	**----**	**----**
Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	**----**	**----**
Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	**----**	**----**
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	**----**	**----**
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	**----**	**----**
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	**----**	**----**
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	**----**	**----**
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	**----**	**----**

Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)				Sample ID	0089_SD375_240528	0089_SD374_240528	0089_SD346_240528	----	----
				Sampling date / time	28-May-2024 11:02	28-May-2024 11:02	28-May-2024 13:13	----	----
Compound	CAS Number	LOR	Unit		EP2407412-006	EP2407412-007	EP2407412-008	--------	--------
					Result	Result	Result	----	----
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	----	----
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	----	----
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	----	----
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	----	----
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	----	----
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	----	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	----	----
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	----	----
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	----	----
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	----	----
EP231P: PFAS Sums									
Sum of PFAS	----	0.0002	mg/kg		**0.0006**	**0.0005**	**0.0021**	----	----
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg		**0.0006**	**0.0005**	**0.0021**	----	----
Sum of PFAS (WA DER List)	----	0.0002	mg/kg		**0.0006**	**0.0005**	**0.0021**	----	----
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.0002	%		**95.5**	**104**	**92.0**	----	----
13C8-PFOA	----	0.0002	%		**100**	**100**	**101**	----	----

Surrogate Control Limits

Sub-Matrix: **SEDIMENT**		Recovery Limits (%)	
Compound	*CAS Number*	*Low*	*High*
EP231S: PFAS Surrogate			
13C4-PFOS	----	76	136
13C8-PFOA	----	78	131

QUALITY CONTROL REPORT

Work Order	: **EP2407412**	Page	: 1 of 7
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: [redacted]
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: +61-8-9406 1301
Project	: WA_0089_PFASOMP_24	Date Samples Received	: 29-May-2024
Order number	: pfas-omp/Stirling	Date Analysis Commenced	: 05-Jun-2024
C-O-C number	: 68275	Issue Date	: 07-Jun-2024
Sampler	: [redacted] [redacted]		
Site	: Stirling SD - JS		
Quote number	: SY/139/19 B		
No. of samples received	: 8		
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]	Laboratory Manager (Perth)	Perth Inorganics, Wangara, WA
[redacted]	Senior Organic Chemist	Perth Organics, Wangara, WA

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: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
EA055: Moisture Content (Dried @ 105-110°C) (QC Lot: 5836323)									
EP2407336-001	Anonymous	EA055: Moisture Content	----	0.1	%	25.5	25.3	0.8	0% - 20%
EP2407412-005	0089_SD378_240528	EA055: Moisture Content	----	0.1	%	18.6	19.3	3.8	0% - 20%
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 5834300)									
EP2407336-004	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
EP2407412-008	0089_SD346_240528	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	0.0021	0.0020	0.0	0% - 50%
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 5834300)									
EP2407336-004	Anonymous	EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit

Sub-Matrix: **SOIL**

				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: 5834300) - continued									
EP2407336-004	Anonymous	EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	<0.001	0.0	No Limit
EP2407412-008	0089_SD346_240528	EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	<0.001	0.0	No Limit
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 5834300)									
EP2407336-004	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
EP2407412-008	0089_SD346_240528	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit

Sub-Matrix: **SOIL**

				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: 5834300) - continued									
EP2407412-008	0089_SD346_240528	EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 5834300)									
EP2407336-004	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
EP2407412-008	0089_SD346_240528	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
EP231P: PFAS Sums (QC Lot: 5834300)									
EP2407336-004	Anonymous	EP231X: Sum of PFAS	----	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Sum of PFAS (WA DER List)	----	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
EP2407412-008	0089_SD346_240528	EP231X: Sum of PFAS	----	0.0002	mg/kg	0.0021	0.0020	4.9	0% - 50%
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg	0.0021	0.0020	4.9	0% - 50%
		EP231X: Sum of PFAS (WA DER List)	----	0.0002	mg/kg	0.0021	0.0020	4.9	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: **SOIL**

				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: 5834300)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	0.0011 mg/kg	94.1	72.0	128
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	0.00125 mg/kg	76.0	73.0	123
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	0.00118 mg/kg	92.8	67.0	130
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	0.00119 mg/kg	105	70.0	132
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	0.00116 mg/kg	92.7	68.0	136
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	0.0012 mg/kg	93.8	59.0	134
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5834300)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	0.00625 mg/kg	87.9	71.0	135
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	0.00125 mg/kg	98.0	69.0	132
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	0.00125 mg/kg	105	70.0	132
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	0.00125 mg/kg	95.6	71.0	131
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	99.6	69.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	98.4	72.0	129
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	0.00125 mg/kg	89.6	69.0	133
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	98.0	64.0	136
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	88.8	69.0	135
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	98.4	66.0	139
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	0.00125 mg/kg	104	69.0	133
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5834300)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	0.00125 mg/kg	92.0	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	0.00312 mg/kg	99.5	59.6	143
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	0.00312 mg/kg	88.0	62.8	140
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	0.00312 mg/kg	121	61.5	139
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	0.00312 mg/kg	94.9	61.9	139
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	0.00125 mg/kg	98.4	63.0	144
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	0.00125 mg/kg	98.8	61.0	139
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5834300)								

Sub-Matrix: **SOIL**

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: 5834300) - continued								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	0.00117 mg/kg	106	62.0	145
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	0.00118 mg/kg	107	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	0.0012 mg/kg	99.6	65.0	137
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	0.0012 mg/kg	90.8	54.8	124
EP231P: PFAS Sums (QCLot: 5834300)								
EP231X: Sum of PFAS	----	0.0002	mg/kg	<0.0002	----	----	----	----
EP231X: Sum of PFHxS and PFOS	355-46-4/17 63-23-1	0.0002	mg/kg	<0.0002	----	----	----	----
EP231X: Sum of PFAS (WA DER List)	----	0.0002	mg/kg	<0.0002	----	----	----	----

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: **SOIL**

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: 5834300)							
EP2407336-005	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0011 mg/kg	96.4	72.0	128
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.00117 mg/kg	83.8	73.0	123
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.00118 mg/kg	92.8	67.0	130
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.00119 mg/kg	106	70.0	132
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.00116 mg/kg	87.8	68.0	136
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0012 mg/kg	91.2	59.0	134
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5834300)							
EP2407336-005	Anonymous	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.00625 mg/kg	93.9	71.0	135
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.00125 mg/kg	101	69.0	132
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.00125 mg/kg	109	70.0	132
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.00125 mg/kg	98.4	71.0	131
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.00125 mg/kg	104	69.0	133
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.00125 mg/kg	99.2	72.0	129
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.00125 mg/kg	101	69.0	133
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.00125 mg/kg	103	64.0	136
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.00125 mg/kg	84.4	69.0	135
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.00125 mg/kg	92.8	66.0	139
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.00125 mg/kg	102	69.0	133
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5834300)							

Sub-Matrix: **SOIL**

				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: 5834300) - continued							
EP2407336-005	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.00125 mg/kg	92.8	48.0	128
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.00312 mg/kg	83.5	60.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.00312 mg/kg	84.3	60.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.00312 mg/kg	105	60.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.00312 mg/kg	103	60.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.00125 mg/kg	80.4	63.0	144
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.00125 mg/kg	91.2	61.0	139
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5834300)							
EP2407336-005	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.00117 mg/kg	97.9	62.0	145
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.00118 mg/kg	109	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0012 mg/kg	107	65.0	137
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0012 mg/kg	82.5	60.0	130

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **EP2407412**	Page	: 1 of 5
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Telephone	: +61-8-9406 1301
Project	: WA_0089_PFASOMP_24	Date Samples Received	: 29-May-2024
Site	: Stirling SD - JS	Issue Date	: 07-Jun-2024
Sampler	: [redacted] [redacted]	No. of samples received	: 8
Order number	: pfas-omp/Stirling	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, where applicable to the methodology, 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: **SOIL**

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*
EA055: Moisture Content (Dried @ 105-110°C)							
HDPE Soil Jar (EA055)							
0089_SD405_240528, 0089_QC107_240528, 0089_SD407_240528, 0089_SD409_240528, 0089_SD378_240528, 0089_SD375_240528, 0089_SD374_240528, 0089_SD346_240528	**28-May-2024**	**----**	----	----	**05-Jun-2024**	11-Jun-2024	✓
EP231A: Perfluoroalkyl Sulfonic Acids							
HDPE Soil Jar (EP231X)							
0089_SD405_240528, 0089_QC107_240528, 0089_SD407_240528, 0089_SD409_240528, 0089_SD378_240528, 0089_SD375_240528, 0089_SD374_240528, 0089_SD346_240528	**28-May-2024**	**05-Jun-2024**	24-Nov-2024	✓	**05-Jun-2024**	15-Jul-2024	✓
EP231B: Perfluoroalkyl Carboxylic Acids							
HDPE Soil Jar (EP231X)							
0089_SD405_240528, 0089_QC107_240528, 0089_SD407_240528, 0089_SD409_240528, 0089_SD378_240528, 0089_SD375_240528, 0089_SD374_240528, 0089_SD346_240528	**28-May-2024**	**05-Jun-2024**	24-Nov-2024	✓	**05-Jun-2024**	15-Jul-2024	✓
EP231C: Perfluoroalkyl Sulfonamides							
HDPE Soil Jar (EP231X)							
0089_SD405_240528, 0089_QC107_240528, 0089_SD407_240528, 0089_SD409_240528, 0089_SD378_240528, 0089_SD375_240528, 0089_SD374_240528, 0089_SD346_240528	**28-May-2024**	**05-Jun-2024**	24-Nov-2024	✓	**05-Jun-2024**	15-Jul-2024	✓
EP231D: (n:2) Fluorotelomer Sulfonic Acids							
HDPE Soil Jar (EP231X)							
0089_SD405_240528, 0089_QC107_240528, 0089_SD407_240528, 0089_SD409_240528, 0089_SD378_240528, 0089_SD375_240528, 0089_SD374_240528, 0089_SD346_240528	**28-May-2024**	**05-Jun-2024**	24-Nov-2024	✓	**05-Jun-2024**	15-Jul-2024	✓

Matrix: **SOIL**

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 Soil Jar (EP231X)							
0089_SD405_240528, 0089_QC107_240528, 0089_SD407_240528, 0089_SD409_240528, 0089_SD378_240528, 0089_SD375_240528, 0089_SD374_240528, 0089_SD346_240528	**28-May-2024**	**05-Jun-2024**	24-Nov-2024	✓	**05-Jun-2024**	15-Jul-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: **SOIL**

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)							
Moisture Content	EA055	2	19	**10.53**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	20	**5.00**	**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
Moisture Content	EA055	SOIL	In house: A gravimetric procedure based on weight loss over a 12 hour drying period at 105-110 degrees C. This method is compliant with NEPM Schedule B(3).
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	SOIL	In-house: Analysis of soils by solvent extraction followed by LC-Electrospray-MS-MS, Negative Mode using MRM using internal standard quantitation. Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to a portion of soil which is then extracted with MTBE and an ion pairing reagent. A portion of extract is exchanged into the analytical solvent mixture, combined with an equal volume reagent water and 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
QuECheRS Extraction of Solids	* ORG71	SOIL	In house: Sequential extractions with Acetonitrile/Methanol by shaking. Extraction efficiency aided by the addition of salts under acidic conditions. Where relevant, interferences from co-extracted organics are removed with dispersive clean-up media (dSPE). The extract is either diluted or concentrated and exchanged into the analytical solvent.

ALSCompass
SAMPLING *Intelligence*

ALS

Environmental Division
Perth
Work Order Reference
EP2407413

Telephone : +61-8-9406 1301

Custody Document for Submissions via ALS Compass App

Project: WA-0089-PFASONP-24 Client: STANTEC Project Manager: [redacted]

Phone: ( )

ALS Compass COC Reference: 68293 68221 68274 68275 68271 68276 # Samples: 68265 68272 68267 Sampler: [redacted]

Phone: ( )

Turnaround Requirements: Standard ~~Urgent~~

Special Instructions:

Custody:

Relinquished by: STANTEC	Received by: [redacted]	Relinquished by:	Received by:
Date / Time: 28/5/24 4 PM	Date / Time: 29/5 1230	Date / Time:	Date / Time:

CHAIN OF CUSTODY

ALS COC#: 68276 ALS Laboratory: EP Perth Environmental

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

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP_24

SITE: Stirling SW/PW - JS

ORDER NO: pfas-omp/Stirling

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] CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

PRIMARY SAMPLER: [redacted] QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted] derp.labreports@esdat.com.au

EMAIL INVOICES TO: [redacted]

SAMPLE DETAILS							ANALYSIS REQUIRED		
SAMPLE	NAME	DESCRIPTION	DATE / TIME	MATRIX	TOTAL BOTTLES	ON HOLD	WA OMP Water Suite WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
001	0089_SW406		28/05/2024 09:02 AM	WATER	ALS: 5 Non ALS: 0	No	X		
002	0089_PW405		28/05/2024 09:03 AM	WATER	ALS: 3 Non ALS: 0	No	X		
003	0089_PW407		28/05/2024 09:09 AM	WATER	ALS: 3 Non ALS: 0	No	X		
004	0089_SW408		28/05/2024 09:10 AM	WATER	ALS: 5 Non ALS: 0	No	X		
005	0089_QC109		28/05/2024 09:46 AM	WATER	ALS: 3 Non ALS: 0	No	X		
006	0089_PW409		28/05/2024 10:21 AM	WATER	ALS: 3 Non ALS: 0	No	X		
007	0089_SW410		28/05/2024 10:22 AM	WATER	ALS: 3 Non ALS: 0	No	X		

CHAIN OF CUSTODY

ALS COC#: 68276 ALS Laboratory: EP Perth Environmental

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

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP_24

SITE: Stirling SW/PW - JS

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted]

QUOTE NO: SY/139/19 B

SAMPLER MOBILE: [redacted] / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]derp.labreports@esdat.com.au

EMAIL INVOICES 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	WA OMP Water Suite WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
008	0089_SW317		28/05/2024 11:03 AM	WATER	ALS: 3 Non ALS: 0	No	X		
009	0089_SW318		28/05/2024 11:04 AM	WATER	ALS: 5 Non ALS: 0	No	X		
010	0089_SW319		28/05/2024 11:07 AM	WATER	ALS: 3 Non ALS: 0	No	X		
011	0089_PW375		28/05/2024 11:12 AM	WATER	ALS: 3 Non ALS: 0	No	X		
012	0089_PW378		28/05/2024 11:13 AM	WATER	ALS: 3 Non ALS: 0	No	X		
013	0089_PW374		28/05/2024 11:13 AM	WATER	ALS: 3 Non ALS: 0	No	X		
014	0089_SW373		28/05/2024 01:08 PM	WATER	ALS: 5 Non ALS: 0	No	X		

CHAIN OF CUSTODY

(ALS) COC#: 68276 *ALS Laboratory:* EP Perth Environmental

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

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP_24

SITE: Stirling SW/PW - JS

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]derp.labreports@esdat.com.au

EMAIL INVOICES 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	WA OMP Water Suite WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
015	0089_SW372		28/05/2024 01:10 PM	WATER	ALS: 5 Non ALS: 0	No	X		
016	0089_PW346		28/05/2024 01:11 PM	WATER	ALS: 5 Non ALS: 0	No	X		

CHAIN OF CUSTODY

COC#: 68276 *ALS Laboratory:* EP Perth Environmental

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

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP_24

SITE: Stirling SW/PW - JS

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]s CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

PRIMARY SAMPLER: [redacted]s QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted], derp.labreports@esdat.com.au

EMAIL INVOICES 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	0089_SW406	Clear Plastic Bottle - Natural	125 mL	00070522145029	Green	No	
001	0089_SW406	HDPE (no PTFE)	20 mL	00350621066875	Grey	No	
001	0089_SW406	HDPE (no PTFE)	20 mL	00350621067056	Grey	No	
001	0089_SW406	HDPE (no PTFE)	20 mL	00350522062453	Grey	No	
001	0089_SW406	HDPE (no PTFE)	20 mL	00350522042771	Grey	No	
002	0089_PW405	HDPE (no PTFE)	20 mL	00350822000365	Grey	No	
002	0089_PW405	HDPE (no PTFE)	20 mL	00350822000450	Grey	No	
002	0089_PW405	Clear Plastic Bottle - Natural	125 mL	00071121129742	Green	No	
003	0089_PW407	Clear Plastic Bottle - Natural	125 mL	00071121129785	Green	No	
003	0089_PW407	HDPE (no PTFE)	20 mL	00350822000559	Grey	No	
003	0089_PW407	HDPE (no PTFE)	20 mL	00350822000518	Grey	No	
004	0089_SW408	HDPE (no PTFE)	20 mL	00350822007904	Grey	No	
004	0089_SW408	HDPE (no PTFE)	20 mL	00350822064043	Grey	No	
004	0089_SW408	Clear Plastic Bottle - Natural	125 mL	00070522068795	Green	No	
004	0089_SW408	HDPE (no PTFE)	20 mL	00351221020742	Grey	No	
004	0089_SW408	HDPE (no PTFE)	20 mL	00351221020966	Grey	No	
005	0089_QC109	Clear Plastic Bottle - Natural	125 mL	00070522168076	Green	No	
005	0089_QC109	HDPE (no PTFE)	20 mL	00351221006302	Grey	No	
005	0089_QC109	HDPE (no PTFE)	20 mL	00351221006036	Grey	No	
006	0089_PW409	HDPE (no PTFE)	20 mL	00351221006012	Grey	No	
006	0089_PW409	HDPE (no PTFE)	20 mL	00351221006152	Grey	No	
006	0089_PW409	Clear Plastic Bottle - Natural	125 mL	00070522167754	Green	No	
007	0089_SW410	HDPE (no PTFE)	20 mL	00351221024798	Grey	No	
007	0089_SW410	HDPE (no PTFE)	20 mL	00351221024664	Grey	No	
007	0089_SW410	Clear Plastic Bottle - Natural	125 mL	00071121177938	Green	No	
008	0089_SW317	HDPE (no PTFE)	20 mL	00352312048774	Grey	No	

CHAIN OF CUSTODY

ALS COC#: 68276 ALS Laboratory: EP Perth Environmental

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

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP_24

SITE: Stirling SW/PW - JS

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]derp.labreports@esdat.com.au

EMAIL INVOICES 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:

008	0089_SW317	HDPE (no PTFE)	20 mL	00352312048557	Grey	No	
008	0089_SW317	Clear Plastic Bottle - Natural	125 mL	00071121178033	Green	No	
009	0089_SW318	Clear Plastic Bottle - Natural	125 mL	00071121178042	Green	No	
009	0089_SW318	HDPE (no PTFE)	20 mL	00351221024747	Grey	No	
009	0089_SW318	HDPE (no PTFE)	20 mL	00351221024861	Grey	No	
009	0089_SW318	HDPE (no PTFE)	20 mL	00351221020403	Grey	No	
009	0089_SW318	HDPE (no PTFE)	20 mL	00351221020408	Grey	No	
010	0089_SW319	HDPE (no PTFE)	20 mL	00351221024770	Grey	No	
010	0089_SW319	HDPE (no PTFE)	20 mL	00351221024754	Grey	No	
010	0089_SW319	Clear Plastic Bottle - Natural	125 mL	00071121178088	Green	No	
011	0089_PW375	Clear Plastic Bottle - Natural	125 mL	00071121178100	Green	No	
011	0089_PW375	HDPE (no PTFE)	20 mL	00351221024867	Grey	No	
011	0089_PW375	HDPE (no PTFE)	20 mL	00351221024848	Grey	No	
012	0089_PW378	HDPE (no PTFE)	20 mL	00351221020592	Grey	No	
012	0089_PW378	HDPE (no PTFE)	20 mL	00351221020791	Grey	No	
012	0089_PW378	Clear Plastic Bottle - Natural	125 mL	00070522075395	Green	No	
013	0089_PW374	Clear Plastic Bottle - Natural	125 mL	00071121178029	Green	No	
013	0089_PW374	HDPE (no PTFE)	20 mL	00351221024853	Grey	No	
013	0089_PW374	HDPE (no PTFE)	20 mL	00351221024712	Grey	No	
014	0089_SW373	HDPE (no PTFE)	20 mL	00352312011903	Grey	No	
014	0089_SW373	HDPE (no PTFE)	20 mL	00352312011830	Grey	No	
014	0089_SW373	HDPE (no PTFE)	20 mL	00350822082531	Grey	No	
014	0089_SW373	HDPE (no PTFE)	20 mL	00350822082586	Grey	No	
014	0089_SW373	Clear Plastic Bottle - Natural	125 mL	00070522054711	Green	No	
015	0089_SW372	HDPE (no PTFE)	20 mL	00352312011814	Grey	No	
015	0089_SW372	HDPE (no PTFE)	20 mL	00352312011744	Grey	No	
015	0089_SW372	Clear Plastic Bottle - Natural	125 mL	00071121178060	Green	No	

CHAIN OF CUSTODY

COC#: 68276 ALS Laboratory: EP Perth Environmental

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

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP_24

SITE: Stirling SW/PW - JS

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER:

CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]derp.labreports@esdat.com.au

EMAIL INVOICES 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:

015	0089_SW372	HDPE (no PTFE)	20 mL	00352312048779	Grey	No	
015	0089_SW372	HDPE (no PTFE)	20 mL	00351221024814	Grey	No	
016	0089_PW346	Clear Plastic Bottle - Natural	125 mL	00070522075529	Green	No	
016	0089_PW346	HDPE (no PTFE)	20 mL	00352312011778	Grey	No	
016	0089_PW346	HDPE (no PTFE)	20 mL	00352312011963	Grey	No	
016	0089_PW346	HDPE (no PTFE)	20 mL	00351221020415	Grey	No	
016	0089_PW346	HDPE (no PTFE)	20 mL	00351221020433	Grey	No	

Total Bottle Count: ALS: 60, Non ALS: 0

SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : **EP2407413**

Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: [redacted]
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
E-mail	: [redacted]stantec.com	E-mail	: [redacted]alsglobal.com
Telephone	: ----	Telephone	: +61-8-9406 1301
Facsimile	: ----	Facsimile	: +61-8-9406 1399
Project	: WA_0089_PFASOMP_24	Page	: 1 of 2
Order number	: pfas-omp/Stirling	Quote number	: ES2022MWHAUS0002 (SY/139/19 B)
C-O-C number	: 68276	QC Level	: NEPM 2013 B3 & ALS QC Standard
Site	: Stirling SW/PW - JS		
Sampler	: [redacted]		

Dates

Date Samples Received	: 29-May-2024 12:30	Issue Date	: 30-May-2024
Client Requested Due Date	: 10-Jun-2024	Scheduled Reporting Date	: **10-Jun-2024**

Delivery Details

Mode of Delivery	: Carrier	Security Seal	: Not Available
No. of coolers/boxes	: 2	Temperature	: 14.1 - Ice present
Receipt Detail	:	No. of samples received / analysed	: 16 / 16

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 see scanned COC for sample discrepencies: extra samples , samples not received etc.
- Please direct any queries related to sample condition / numbering / breakages to Sample Receipt (Samples.Perth@alsglobal.com)
- Analytical work for this work order will be conducted at ALS Environmental Perth.
- Please direct any turnaround / technical queries to the laboratory contact designated above.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months) from receipt of samples.
- **pH analysis should be conducted within 6 hours of sampling.**
- **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.**
- 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 (30 analytes)	WATER - NT-01 & 02 Ca, Mg, Na, K, Cl, SO4, Alkalinity
EP2407413-001	28-May-2024 09:02	0089_SW406_240528	✓	✓
EP2407413-002	28-May-2024 09:03	0089_PW405_240528	✓	✓
EP2407413-003	28-May-2024 09:09	0089_PW407_240528	✓	✓
EP2407413-004	28-May-2024 09:10	0089_SW408_240528	✓	✓
EP2407413-005	28-May-2024 09:46	0089_QC109_240528	✓	✓
EP2407413-006	28-May-2024 10:21	0089_PW409_240528	✓	✓
EP2407413-007	28-May-2024 10:22	0089_SW410_240528	✓	✓
EP2407413-008	28-May-2024 11:03	0089_SW317_240528	✓	✓
EP2407413-009	28-May-2024 11:04	0089_SW318_240528	✓	✓
EP2407413-010	28-May-2024 11:07	0089_SW319_240528	✓	✓
EP2407413-011	28-May-2024 11:12	0089_PW375_240528	✓	✓
EP2407413-012	28-May-2024 11:13	0089_PW378_240528	✓	✓
EP2407413-013	28-May-2024 11:13	0089_PW374_240528	✓	✓
EP2407413-014	28-May-2024 13:08	0089_SW373_240528	✓	✓
EP2407413-015	28-May-2024 13:10	0089_SW372_240528	✓	✓
EP2407413-016	28-May-2024 13:11	0089_PW346_240528	✓	✓

Proactive Holding Time Report

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

Requested Deliverables

[redacted]
- A4 - AU Tax Invoice (INV) — Email — [redacted]cardno.com.au

DERP LAB REPORTS
- EDI Format - ESDAT (ESDAT) — Email — derp.labreports@esdat.com.au

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

CERTIFICATE OF ANALYSIS

Work Order	: **EP2407413**	Page	: 1 of 15
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: [redacted]
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: +61-8-9406 1301
Project	: WA_0089_PFASOMP_24	Date Samples Received	: 29-May-2024 12:30
Order number	: pfas-omp/Stirling	Date Analysis Commenced	: 31-May-2024
C-O-C number	: 68276	Issue Date	: 10-Jun-2024 21:07
Sampler	: [redacted] [redacted]		
Site	: Stirling SW/PW - JS		
Quote number	: SY/139/19 B		
No. of samples received	: 16		
No. of samples analysed	: 16		

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]	Inorganics Supervisor	Perth Inorganics, Wangara, WA
[redacted]	Laboratory Manager (Perth)	Perth Inorganics, Wangara, WA
[redacted]	Metals Chemist	Perth Inorganics, Wangara, WA
[redacted]	Senior Organic Chemist	Perth Organics, Wangara, WA

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.
- As per QWI – EN55-3 Data Interpreting Procedures, Ionic balances are typically calculated using Major Anions - Chloride, Alkalinity and Sulfate; and Major Cations - Calcium, Magnesium, Potassium and Sodium. Where applicable and dependent upon sample matrix, the Ionic Balance may also include the additional contribution of Ammonia, Dissolved Metals by ICPMS and H+ to the Cations and Nitrate, SiO2 and Fluoride to the Anions.
- ED037-P (Alkalinity): EP2407413-016 was filtered prior to analysis to reduce possible interference from sediment which may consume the alkalinity titrant.
- Sodium Adsorption Ratio (where reported): Where results for Na, Ca or Mg are <LOR, a concentration at half the reported LOR is incorporated into the SAR calculation. This represents a conservative approach for Na relative to the assumption that <LOR = zero concentration and a conservative approach for Ca & Mg relative to the assumption that <LOR is equivalent to the LOR concentration.
- 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.
- ED045G: The presence of Thiocyanate, Thiosulfate and Sulfite can positively contribute to the chloride result, thereby may bias results higher than expected. Results should be scrutinised accordingly.

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_PW375_240528	0089_PW378_240528	0089_PW374_240528	----	----
				Sampling date / time	28-May-2024 11:12	28-May-2024 11:13	28-May-2024 11:13	----	----
Compound	CAS Number	LOR	Unit		EP2407413-011	EP2407413-012	EP2407413-013	--------	--------
					Result	Result	Result	----	----
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	<1	<1	----	----
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	<1	<1	----	----
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		183	146	412	----	----
Total Alkalinity as CaCO3	----	1	mg/L		183	146	412	----	----
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		2580	2110	2260	----	----
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		16400	14100	13800	----	----
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		448	394	391	----	----
Magnesium	7439-95-4	1	mg/L		1390	1200	1200	----	----
Sodium	7440-23-5	1	mg/L		10600	9060	9180	----	----
Potassium	7440-09-7	1	mg/L		590	502	528	----	----
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		520	444	444	----	----
ø Total Cations	----	0.01	meq/L		613	525	531	----	----
ø Ionic Balance	----	0.01	%		8.20	8.33	8.87	----	----
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		0.68	0.10	0.82	----	----
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	<0.02	<0.02	----	----

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_PW375_240528	0089_PW378_240528	0089_PW374_240528	----	----
				Sampling date / time	28-May-2024 11:12	28-May-2024 11:13	28-May-2024 11:13	----	----
Compound	CAS Number	LOR	Unit		EP2407413-011	EP2407413-012	EP2407413-013	--------	--------
					Result	Result	Result	----	----
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	----	----
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									

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_PW375_240528	0089_PW378_240528	0089_PW374_240528	----	----
				Sampling date / time	28-May-2024 11:12	28-May-2024 11:13	28-May-2024 11:13	----	----
Compound	CAS Number	LOR	Unit		EP2407413-011	EP2407413-012	EP2407413-013	--------	--------
					Result	Result	Result	----	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
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		**0.72**	**0.10**	**0.82**	----	----
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		**0.68**	**0.10**	**0.82**	----	----
Sum of PFAS (WA DER List)	----	0.01	µg/L		**0.68**	**0.10**	**0.82**	----	----
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**107**	**102**	**97.9**	----	----
13C8-PFOA	----	0.02	%		**113**	**97.4**	**110**	----	----

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_SW406_240528	0089_PW405_240528	0089_PW407_240528	0089_SW408_240528	0089_QC109_240528
				Sampling date / time	28-May-2024 09:02	28-May-2024 09:03	28-May-2024 09:09	28-May-2024 09:10	28-May-2024 09:46
Compound	CAS Number	LOR	Unit		EP2407413-001	EP2407413-002	EP2407413-003	EP2407413-004	EP2407413-005
					Result	Result	Result	Result	Result
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	<1	<1	<1	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	<1	<1	<1	<1
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		124	127	126	132	127
Total Alkalinity as CaCO3	----	1	mg/L		124	127	126	132	127
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		2590	2590	2500	2480	2500
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		16000	16600	16500	16300	16600
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		434	441	432	425	430
Magnesium	7439-95-4	1	mg/L		1400	1370	1360	1370	1380
Sodium	7440-23-5	1	mg/L		10200	10300	10200	9990	10000
Potassium	7440-09-7	1	mg/L		565	582	573	552	554
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		508	525	520	514	523
ø Total Cations	----	0.01	meq/L		595	598	592	583	584
ø Ionic Balance	----	0.01	%		7.91	6.50	6.46	6.25	5.54
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

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_SW406_240528	0089_PW405_240528	0089_PW407_240528	0089_SW408_240528	0089_QC109_240528
				Sampling date / time	28-May-2024 09:02	28-May-2024 09:03	28-May-2024 09:09	28-May-2024 09:10	28-May-2024 09:46
Compound	CAS Number	LOR	Unit		EP2407413-001	EP2407413-002	EP2407413-003	EP2407413-004	EP2407413-005
					Result	Result	Result	Result	Result
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
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									

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_SW406_240528	0089_PW405_240528	0089_PW407_240528	0089_SW408_240528	0089_QC109_240528
				Sampling date / time	28-May-2024 09:02	28-May-2024 09:03	28-May-2024 09:09	28-May-2024 09:10	28-May-2024 09:46
Compound	CAS Number	LOR	Unit		EP2407413-001	EP2407413-002	EP2407413-003	EP2407413-004	EP2407413-005
					Result	Result	Result	Result	Result
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
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	%		**105**	**104**	**100**	**110**	**105**
13C8-PFOA	----	0.02	%		**102**	**100**	**105**	**102**	**99.5**

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_PW409_240528	0089_SW410_240528	0089_SW317_240528	0089_SW318_240528	0089_SW319_240528
				Sampling date / time	28-May-2024 10:21	28-May-2024 10:22	28-May-2024 11:03	28-May-2024 11:04	28-May-2024 11:07
Compound	CAS Number	LOR	Unit		EP2407413-006	EP2407413-007	EP2407413-008	EP2407413-009	EP2407413-010
					Result	Result	Result	Result	Result
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	<1	<1	<1	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	<1	<1	<1	<1
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		133	124	123	126	123
Total Alkalinity as CaCO3	----	1	mg/L		133	124	123	126	123
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		2400	2500	2560	2640	2640
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		15700	15800	16800	17200	17700
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		421	440	453	446	442
Magnesium	7439-95-4	1	mg/L		1340	1410	1430	1400	1400
Sodium	7440-23-5	1	mg/L		9730	10200	10900	10600	10600
Potassium	7440-09-7	1	mg/L		537	569	609	592	589
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		496	500	530	543	557
ø Total Cations	----	0.01	meq/L		568	596	630	614	613
ø Ionic Balance	----	0.01	%		6.84	8.76	8.65	6.14	4.84
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	0.02	<0.01
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_PW409_240528	0089_SW410_240528	0089_SW317_240528	0089_SW318_240528	0089_SW319_240528
				Sampling date / time	28-May-2024 10:21	28-May-2024 10:22	28-May-2024 11:03	28-May-2024 11:04	28-May-2024 11:07
Compound	CAS Number	LOR	Unit		EP2407413-006	EP2407413-007	EP2407413-008	EP2407413-009	EP2407413-010
					Result	Result	Result	Result	Result
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
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									

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_PW409_240528	0089_SW410_240528	0089_SW317_240528	0089_SW318_240528	0089_SW319_240528
				Sampling date / time	28-May-2024 10:21	28-May-2024 10:22	28-May-2024 11:03	28-May-2024 11:04	28-May-2024 11:07
Compound	CAS Number	LOR	Unit		EP2407413-006	EP2407413-007	EP2407413-008	EP2407413-009	EP2407413-010
					Result	Result	Result	Result	Result
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
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	**0.02**	<0.01
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		**0.01**	<0.01	<0.01	**0.02**	<0.01
Sum of PFAS (WA DER List)	----	0.01	µg/L		**0.01**	<0.01	<0.01	**0.02**	<0.01
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**98.9**	**105**	**100**	**104**	**102**
13C8-PFOA	----	0.02	%		**110**	**107**	**103**	**96.0**	**100**

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_SW373_240528	0089_SW372_240528	0089_PW346_240528	----	----
				Sampling date / time	28-May-2024 13:08	28-May-2024 13:10	28-May-2024 13:11	----	----
Compound	CAS Number	LOR	Unit		EP2407413-014	EP2407413-015	EP2407413-016	--------	--------
					Result	Result	Result	----	----
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	<1	<1	----	----
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	<1	<1	----	----
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		130	134	247	----	----
Total Alkalinity as CaCO3	----	1	mg/L		130	134	247	----	----
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		2500	2640	2060	----	----
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		16800	16600	15000	----	----
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		436	441	399	----	----
Magnesium	7439-95-4	1	mg/L		1380	1380	1210	----	----
Sodium	7440-23-5	1	mg/L		10400	10400	9070	----	----
Potassium	7440-09-7	1	mg/L		584	586	509	----	----
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		528	526	471	----	----
ø Total Cations	----	0.01	meq/L		603	603	527	----	----
ø Ionic Balance	----	0.01	%		6.55	6.82	5.62	----	----
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	0.03	----	----
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		0.06	0.04	0.19	----	----
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	<0.02	<0.02	----	----

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_SW373_240528	0089_SW372_240528	0089_PW346_240528	----	----
				Sampling date / time	28-May-2024 13:08	28-May-2024 13:10	28-May-2024 13:11	----	----
Compound	CAS Number	LOR	Unit		EP2407413-014	EP2407413-015	EP2407413-016	--------	--------
					Result	Result	Result	----	----
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	----	----
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									

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_SW373_240528	0089_SW372_240528	0089_PW346_240528	----	----
				Sampling date / time	28-May-2024 13:08	28-May-2024 13:10	28-May-2024 13:11	----	----
Compound	CAS Number	LOR	Unit		EP2407413-014	EP2407413-015	EP2407413-016	--------	--------
					Result	Result	Result	----	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
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		**0.06**	**0.04**	**0.22**	----	----
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		**0.06**	**0.04**	**0.22**	----	----
Sum of PFAS (WA DER List)	----	0.01	µg/L		**0.06**	**0.04**	**0.22**	----	----
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**102**	**106**	**105**	----	----
13C8-PFOA	----	0.02	%		**103**	**110**	**103**	----	----

Surrogate Control Limits

Sub-Matrix: GROUNDWATER		Recovery Limits (%)	
Compound	CAS Number	Low	High
EP231S: PFAS Surrogate			
13C4-PFOS	----	65	140
13C8-PFOA	----	71	133

Sub-Matrix: SURFACE WATER		Recovery Limits (%)	
Compound	CAS Number	Low	High
EP231S: PFAS Surrogate			
13C4-PFOS	----	65	140
13C8-PFOA	----	71	133

QUALITY CONTROL REPORT

Work Order	: **EP2407413**	Page	: 1 of 18
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: [redacted]
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: +61-8-9406 1301
Project	: WA_0089_PFASOMP_24	Date Samples Received	: 29-May-2024
Order number	: pfas-omp/Stirling	Date Analysis Commenced	: 31-May-2024
C-O-C number	: 68276	Issue Date	: 10-Jun-2024
Sampler	: [redacted] [redacted]		
Site	: Stirling SW/PW - JS		
Quote number	: SY/139/19 B		
No. of samples received	: 16		
No. of samples analysed	: 16		

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]	Inorganics Supervisor	Perth Inorganics, Wangara, WA
[redacted]	Laboratory Manager (Perth)	Perth Inorganics, Wangara, WA
[redacted]	Metals Chemist	Perth Inorganics, Wangara, WA
[redacted]	Senior Organic Chemist	Perth Organics, Wangara, WA

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 (%)
ED037P: Alkalinity by PC Titrator (QC Lot: 5836852)									
EP2407384-008	Anonymous	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	651	651	0.0	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	651	651	0.0	0% - 20%
EP2407413-008	0089_SW317_240528	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	123	123	0.0	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	123	123	0.0	0% - 20%
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QC Lot: 5827152)									
EP2407337-001	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	2480	2570	3.4	0% - 20%
EP2407337-011	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	2560	2490	2.5	0% - 20%
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QC Lot: 5827154)									
EP2407413-007	0089_SW410_240528	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	2500	2420	3.1	0% - 20%
EP2407475-004	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	64	65	1.8	0% - 20%
ED045G: Chloride by Discrete Analyser (QC Lot: 5827153)									
EP2407337-001	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	17000	15900	6.5	0% - 20%
EP2407337-011	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	17000	16700	1.8	0% - 20%
ED045G: Chloride by Discrete Analyser (QC Lot: 5827155)									
EP2407413-007	0089_SW410_240528	ED045G: Chloride	16887-00-6	1	mg/L	15800	15600	0.8	0% - 20%
EP2407475-004	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	41	40	0.0	0% - 20%
ED093F: Dissolved Major Cations (QC Lot: 5827887)									
EP2407384-002	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	80	76	5.8	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 (%)*
ED093F: Dissolved Major Cations (QC Lot: 5827887) - continued									
EP2407384-002	Anonymous	ED093F: Magnesium	7439-95-4	1	mg/L	13	12	0.0	0% - 50%
		ED093F: Sodium	7440-23-5	1	mg/L	28	25	12.0	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	6	6	0.0	No Limit
EP2407462-001	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	10	10	0.0	No Limit
		ED093F: Magnesium	7439-95-4	1	mg/L	11	11	0.0	0% - 50%
		ED093F: Sodium	7440-23-5	1	mg/L	70	70	0.0	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	12	11	0.0	0% - 50%
ED093F: Dissolved Major Cations (QC Lot: 5827901)									
EP2407316-001	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	441	440	0.3	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	1370	1370	0.1	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	10400	10400	0.5	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	581	582	0.0	0% - 20%
EP2407384-005	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	160	164	2.2	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	41	42	0.0	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	239	242	1.0	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	17	17	0.0	0% - 50%
ED093F: Dissolved Major Cations (QC Lot: 5827902)									
EP2407316-010	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	440	438	0.3	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	1380	1380	0.0	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	10500	10500	0.1	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	588	588	0.0	0% - 20%
EP2407384-010	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	80	80	0.0	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	11	10	0.0	0% - 50%
		ED093F: Sodium	7440-23-5	1	mg/L	25	23	6.4	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	4	4	0.0	No Limit
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 5835276)									
EP2407413-004	0089_SW408_240528	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
EP2407413-015	0089_SW372_240528	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	0.04	0.02	67.4	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

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: 5835276) - continued									
EP2407413-015	0089_SW372_240528	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: 5835294)									
EP2407384-004	Anonymous	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
EP2407384-013	Anonymous	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: 5835299)									
EP2407413-009	0089_SW318_240528	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	0.02	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
EP2407417-006	Anonymous	EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	0.24	0.23	0.0	0% - 20%
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	0.02	0.02	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
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 5835276)									
EP2407413-004	0089_SW408_240528	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

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: 5835276) - continued									
EP2407413-004	0089_SW408_240528	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
EP2407413-015	0089_SW372_240528	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: 5835294)									
EP2407384-004	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
EP2407384-013	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
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 5835299)									

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: 5835299) - continued									
EP2407413-009	0089_SW318_240528	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
EP2407417-006	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: 5835276)									
EP2407413-004	0089_SW408_240528	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
EP2407413-015	0089_SW372_240528	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 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: 5835276) - continued									
EP2407413-015	0089_SW372_240528	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: 5835294)									
EP2407384-004	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
EP2407384-013	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
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 5835299)									
EP2407413-009	0089_SW318_240528	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 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: 5835299) - continued									
EP2407413-009	0089_SW318_240528	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
EP2407417-006	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: 5835276)									
EP2407413-004	0089_SW408_240528	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
EP2407413-015	0089_SW372_240528	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: 5835294)									

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: 5835294) - continued									
EP2407384-004	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
EP2407384-013	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
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 5835299)									
EP2407413-009	0089_SW318_240528	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
EP2407417-006	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: 5835276)									
EP2407413-004	0089_SW408_240528	EP231X: Sum of PFAS	----	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	<0.01	<0.01	0.0	No Limit
EP2407413-015	0089_SW372_240528	EP231X: Sum of PFAS	----	0.01	µg/L	0.04	0.02	66.7	No Limit
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	0.04	0.02	66.7	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 (%)*
EP231P: PFAS Sums (QC Lot: 5835276) - continued									
EP2407413-015	0089_SW372_240528	EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	0.04	0.02	66.7	No Limit
EP231P: PFAS Sums (QC Lot: 5835294)									
EP2407384-004	Anonymous	EP231X: Sum of PFAS	----	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	<0.01	<0.01	0.0	No Limit
EP2407384-013	Anonymous	EP231X: Sum of PFAS	----	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	<0.01	<0.01	0.0	No Limit
EP231P: PFAS Sums (QC Lot: 5835299)									
EP2407413-009	0089_SW318_240528	EP231X: Sum of PFAS	----	0.01	µg/L	0.02	0.01	66.7	No Limit
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	0.02	0.01	66.7	No Limit
		EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	0.02	0.01	66.7	No Limit
EP2407417-006	Anonymous	EP231X: Sum of PFAS	----	0.01	µg/L	0.26	0.25	3.9	0% - 20%
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	0.26	0.25	3.9	0% - 20%
		EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	0.26	0.25	3.9	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
ED037P: Alkalinity by PC Titrator (QCLot: 5836852)								
ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	----	----	----	----
ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	----	----	----	----
ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	<1	----	----	----	----
ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	<1	20 mg/L	101	85.1	126
				<1	200 mg/L	99.4	90.5	111
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 5827152)								
ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<1	25 mg/L	103	89.9	112
				<1	500 mg/L	100	89.9	112
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 5827154)								
ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<1	25 mg/L	102	89.9	112
				<1	500 mg/L	102	89.9	112
ED045G: Chloride by Discrete Analyser (QCLot: 5827153)								
ED045G: Chloride	16887-00-6	1	mg/L	<1	10 mg/L	98.7	88.6	113
				<1	1000 mg/L	102	88.6	113
ED045G: Chloride by Discrete Analyser (QCLot: 5827155)								
ED045G: Chloride	16887-00-6	1	mg/L	<1	10 mg/L	99.2	88.6	113
				<1	1000 mg/L	95.4	88.6	113
ED093F: Dissolved Major Cations (QCLot: 5827887)								
ED093F: Calcium	7440-70-2	1	mg/L	<1	50 mg/L	104	86.5	117
ED093F: Magnesium	7439-95-4	1	mg/L	<1	50 mg/L	103	88.4	110
ED093F: Sodium	7440-23-5	1	mg/L	<1	50 mg/L	101	91.4	113
ED093F: Potassium	7440-09-7	1	mg/L	<1	50 mg/L	96.6	84.6	108
ED093F: Dissolved Major Cations (QCLot: 5827901)								
ED093F: Calcium	7440-70-2	1	mg/L	<1	50 mg/L	101	86.5	117
ED093F: Magnesium	7439-95-4	1	mg/L	<1	50 mg/L	100	88.4	110
ED093F: Sodium	7440-23-5	1	mg/L	<1	50 mg/L	99.3	91.4	113
ED093F: Potassium	7440-09-7	1	mg/L	<1	50 mg/L	96.3	84.6	108
ED093F: Dissolved Major Cations (QCLot: 5827902)								
ED093F: Calcium	7440-70-2	1	mg/L	<1	50 mg/L	99.9	86.5	117
ED093F: Magnesium	7439-95-4	1	mg/L	<1	50 mg/L	99.1	88.4	110

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
ED093F: Dissolved Major Cations (QCLot: 5827902) - continued								
ED093F: Sodium	7440-23-5	1	mg/L	<1	50 mg/L	98.2	91.4	113
ED093F: Potassium	7440-09-7	1	mg/L	<1	50 mg/L	95.2	84.6	108
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5835276)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.2218 µg/L	96.0	72.0	130
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.2352 µg/L	108	71.0	127
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	0.2373 µg/L	97.3	68.0	131
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.238 µg/L	101	69.0	134
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.232 µg/L	97.8	65.0	140
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.241 µg/L	91.7	53.0	142
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5835294)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.2218 µg/L	97.4	72.0	130
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.2352 µg/L	83.5	71.0	127
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	0.2373 µg/L	93.6	68.0	131
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.238 µg/L	105	69.0	134
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.232 µg/L	97.6	65.0	140
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.241 µg/L	101	53.0	142
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5835299)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.2218 µg/L	89.5	72.0	130
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.2352 µg/L	91.2	71.0	127
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	0.2373 µg/L	93.3	68.0	131
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.238 µg/L	102	69.0	134
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.232 µg/L	78.4	65.0	140
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.241 µg/L	79.5	53.0	142
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5835276)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	1.25 µg/L	103	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	99.2	72.0	129
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	0.25 µg/L	103	72.0	130
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	0.25 µg/L	97.4	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	97.8	71.0	129
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	0.25 µg/L	103	69.0	133
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	0.25 µg/L	101	72.0	134
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	0.25 µg/L	110	65.0	144

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: 5835276) - continued								
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	0.25 µg/L	106	71.0	132
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5835294)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	1.25 µg/L	97.2	73.0	129
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	0.25 µg/L	104	72.0	129
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	0.25 µg/L	111	72.0	129
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	0.25 µg/L	101	72.0	130
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	0.25 µg/L	96.6	71.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	0.25 µg/L	96.4	69.0	130
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	0.25 µg/L	97.0	71.0	129
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	0.25 µg/L	105	69.0	133
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	0.25 µg/L	102	72.0	134
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	0.25 µg/L	95.2	65.0	144
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	0.25 µg/L	100	71.0	132
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5835299)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	1.25 µg/L	93.6	73.0	129
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	0.25 µg/L	97.8	72.0	129
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	0.25 µg/L	99.6	72.0	129
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	0.25 µg/L	88.2	72.0	130
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	0.25 µg/L	94.8	71.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	0.25 µg/L	85.4	69.0	130
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	0.25 µg/L	88.8	71.0	129
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	0.25 µg/L	111	69.0	133
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	0.25 µg/L	88.0	72.0	134
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	0.25 µg/L	95.8	65.0	144
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	0.25 µg/L	98.4	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5835276)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.25 µg/L	105	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	0.625 µg/L	108	68.0	141
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	0.625 µg/L	98.4	60.5	138
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	0.625 µg/L	104	68.3	134
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	0.625 µg/L	112	62.2	138
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	0.25 µg/L	102	65.0	136

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
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5835276) - continued								
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	0.25 µg/L	104	61.0	135
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5835294)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.25 µg/L	96.6	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	0.625 µg/L	97.3	68.0	141
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	0.625 µg/L	102	60.5	138
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	0.625 µg/L	112	68.3	134
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	0.625 µg/L	93.6	62.2	138
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	0.25 µg/L	111	65.0	136
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	0.25 µg/L	99.4	61.0	135
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5835299)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.25 µg/L	86.2	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	0.625 µg/L	108	68.0	141
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	0.625 µg/L	99.4	60.5	138
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	0.625 µg/L	96.7	68.3	134
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	0.625 µg/L	101	62.2	138
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	0.25 µg/L	96.8	65.0	136
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	0.25 µg/L	80.4	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5835276)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.2343 µg/L	108	63.0	143
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	0.2378 µg/L	109	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	0.24 µg/L	110	67.0	138
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	0.241 µg/L	113	64.2	133
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5835294)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.2343 µg/L	111	63.0	143
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	0.2378 µg/L	105	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	0.24 µg/L	115	67.0	138
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	0.241 µg/L	98.5	64.2	133
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5835299)								

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: 5835299) - continued								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.2343 µg/L	93.7	63.0	143
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	0.2378 µg/L	84.7	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	0.24 µg/L	88.8	67.0	138
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	0.241 µg/L	86.3	64.2	133
EP231P: PFAS Sums (QCLot: 5835276)								
EP231X: Sum of PFAS	----	0.01	µg/L	<0.01	----	----	----	----
EP231X: Sum of PFHxS and PFOS	355-46-4/17 63-23-1	0.01	µg/L	<0.01	----	----	----	----
EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	<0.01	----	----	----	----
EP231P: PFAS Sums (QCLot: 5835294)								
EP231X: Sum of PFAS	----	0.01	µg/L	<0.01	----	----	----	----
EP231X: Sum of PFHxS and PFOS	355-46-4/17 63-23-1	0.01	µg/L	<0.01	----	----	----	----
EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	<0.01	----	----	----	----
EP231P: PFAS Sums (QCLot: 5835299)								
EP231X: Sum of PFAS	----	0.01	µg/L	<0.01	----	----	----	----
EP231X: Sum of PFHxS and PFOS	355-46-4/17 63-23-1	0.01	µg/L	<0.01	----	----	----	----
EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	<0.01	----	----	----	----

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
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 5827152)							
EP2407337-001	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	100 mg/L	# Not Determined	70.4	130
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 5827154)							
EP2407413-007	0089_SW410_240528	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	100 mg/L	# Not Determined	70.4	130
ED045G: Chloride by Discrete Analyser (QCLot: 5827153)							
EP2407337-001	Anonymous	ED045G: Chloride	16887-00-6	200 mg/L	# Not Determined	70.0	130

Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*Concentration*	*MS*	*Low*	*High*
ED045G: Chloride by Discrete Analyser (QCLot: 5827155)							
EP2407413-007	0089_SW410_240528	ED045G: Chloride	16887-00-6	200 mg/L	# Not Determined	70.0	130
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5835276)							
EP2407413-014	0089_SW373_240528	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.2218 µg/L	93.7	72.0	129
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.232 µg/L	98.9	71.0	127
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.2352 µg/L	89.6	68.0	129
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.238 µg/L	101	69.0	134
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.232 µg/L	90.4	65.0	140
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.241 µg/L	85.7	53.0	129
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5835294)							
EP2407384-009	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.2218 µg/L	82.9	72.0	129
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.232 µg/L	78.6	71.0	127
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.2352 µg/L	# Not Determined	68.0	129
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.238 µg/L	127	69.0	134
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.232 µg/L	92.4	65.0	140
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.241 µg/L	100	53.0	129
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5835299)							
EP2407417-003	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.2218 µg/L	81.5	72.0	129
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.232 µg/L	90.5	71.0	127
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.2352 µg/L	83.6	68.0	129
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.238 µg/L	104	69.0	134
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.232 µg/L	73.6	65.0	140
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.241 µg/L	92.3	53.0	129
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5835276)							
EP2407413-014	0089_SW373_240528	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	1.25 µg/L	101	73.0	142
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.25 µg/L	100	72.0	129
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.25 µg/L	105	72.0	129
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.25 µg/L	102	72.0	130
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.25 µg/L	100	71.0	133
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.25 µg/L	99.2	69.0	130
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.25 µg/L	98.4	71.0	134
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.25 µg/L	102	69.0	133
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.25 µg/L	106	72.0	134
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.25 µg/L	121	65.0	144
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.25 µg/L	100	71.0	132
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5835294)							
EP2407384-009	Anonymous	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	1.25 µg/L	92.7	73.0	142

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: 5835294) - continued							
EP2407384-009	Anonymous	EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.25 µg/L	87.4	72.0	129
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.25 µg/L	109	72.0	129
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.25 µg/L	82.8	72.0	130
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.25 µg/L	93.2	71.0	133
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.25 µg/L	92.7	69.0	130
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.25 µg/L	88.7	71.0	134
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.25 µg/L	97.8	69.0	133
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.25 µg/L	98.7	72.0	134
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.25 µg/L	87.3	65.0	144
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.25 µg/L	88.7	71.0	132
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5835299)							
EP2407417-003	Anonymous	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	1.25 µg/L	92.4	73.0	142
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.25 µg/L	100.0	72.0	129
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.25 µg/L	105	72.0	129
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.25 µg/L	88.1	72.0	130
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.25 µg/L	92.7	71.0	133
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.25 µg/L	102	69.0	130
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.25 µg/L	93.0	71.0	134
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.25 µg/L	103	69.0	133
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.25 µg/L	93.6	72.0	134
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.25 µg/L	96.8	65.0	144
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.25 µg/L	93.1	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5835276)							
EP2407413-014	0089_SW373_240528	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.25 µg/L	101	59.0	135
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.625 µg/L	110	70.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.625 µg/L	105	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.625 µg/L	109	70.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.625 µg/L	106	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.25 µg/L	90.0	65.0	136
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.25 µg/L	93.9	61.0	135
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5835294)							
EP2407384-009	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.25 µg/L	94.2	59.0	135
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.625 µg/L	110	70.0	130

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: 5835294) - continued							
EP2407384-009	Anonymous	EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.625 µg/L	91.3	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.625 µg/L	109	70.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.625 µg/L	113	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.25 µg/L	102	65.0	136
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.25 µg/L	94.5	61.0	135
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5835299)							
EP2407417-003	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.25 µg/L	84.0	59.0	135
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.625 µg/L	98.8	70.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.625 µg/L	114	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.625 µg/L	99.7	70.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.625 µg/L	100	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.25 µg/L	89.8	65.0	136
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.25 µg/L	96.6	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5835276)							
EP2407413-014	0089_SW373_240528	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.234 µg/L	98.9	63.0	143
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.2378 µg/L	114	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.24 µg/L	98.8	67.0	138
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.2415 µg/L	92.6	70.0	130
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5835294)							
EP2407384-009	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.234 µg/L	97.2	63.0	143
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.2378 µg/L	98.2	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.24 µg/L	92.0	67.0	138
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.2415 µg/L	93.2	70.0	130
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5835299)							
EP2407417-003	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.234 µg/L	96.6	63.0	143
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.2378 µg/L	101	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.24 µg/L	93.6	67.0	138
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.2415 µg/L	89.7	70.0	130

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **EP2407413**	Page	: 1 of 7
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Telephone	: +61-8-9406 1301
Project	: WA_0089_PFASOMP_24	Date Samples Received	: 29-May-2024
Site	: Stirling SW/PW - JS	Issue Date	: 10-Jun-2024
Sampler	: [redacted]	No. of samples received	: 16
Order number	: pfas-omp/Stirling	No. of samples analysed	: 16

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.**
- **Matrix Spike outliers exist - please see following pages for full details.**
- **For all regular sample matrices, where applicable to the methodology, 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.**

Outliers : Quality Control Samples

Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

Matrix: **WATER**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
Matrix Spike (MS) Recoveries							
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA	EP2407337--001	Anonymous	**Sulfate as SO4 - Turbidimetric**	14808-79-8	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA	EP2407413--007	0089_SW410_240528	**Sulfate as SO4 - Turbidimetric**	14808-79-8	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
ED045G: Chloride by Discrete Analyser	EP2407337--001	Anonymous	**Chloride**	16887-00-6	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
ED045G: Chloride by Discrete Analyser	EP2407413--007	0089_SW410_240528	**Chloride**	16887-00-6	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
EP231A: Perfluoroalkyl Sulfonic Acids	EP2407384--009	Anonymous	**Perfluorohexane sulfonic acid (PFHxS)**	355-46-4	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**

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
ED037P: Alkalinity by PC Titrator								
Clear Plastic Bottle - Natural (ED037-P)								
0089_SW406_240528,	0089_PW405_240528,	**28-May-2024**	**----**	----	**----**	**05-Jun-2024**	11-Jun-2024	✓
0089_PW407_240528,	0089_SW408_240528,							
0089_QC109_240528,	0089_PW409_240528,							
0089_SW410_240528,	0089_SW317_240528,							
0089_SW318_240528,	0089_SW319_240528,							
0089_PW375_240528,	0089_PW378_240528,							
0089_PW374_240528,	0089_SW373_240528,							
0089_SW372_240528,	0089_PW346_240528							

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
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA							
Clear Plastic Bottle - Natural (ED041G)							
0089_SW406_240528, 0089_PW405_240528, 0089_PW407_240528, 0089_SW408_240528, 0089_QC109_240528, 0089_PW409_240528	**28-May-2024**	**----**	----	----	**08-Jun-2024**	25-Jun-2024	✓
Clear Plastic Bottle - Natural (ED041G)							
0089_SW410_240528, 0089_SW317_240528, 0089_SW318_240528, 0089_SW319_240528, 0089_PW375_240528, 0089_PW378_240528, 0089_PW374_240528, 0089_SW373_240528, 0089_SW372_240528, 0089_PW346_240528	**28-May-2024**	**----**	----	----	**10-Jun-2024**	25-Jun-2024	✓
ED045G: Chloride by Discrete Analyser							
Clear Plastic Bottle - Natural (ED045G)							
0089_SW406_240528, 0089_PW405_240528, 0089_PW407_240528, 0089_SW408_240528, 0089_QC109_240528, 0089_PW409_240528	**28-May-2024**	**----**	----	----	**08-Jun-2024**	25-Jun-2024	✓
Clear Plastic Bottle - Natural (ED045G)							
0089_SW410_240528, 0089_SW317_240528, 0089_SW318_240528, 0089_SW319_240528, 0089_PW375_240528, 0089_PW378_240528, 0089_PW374_240528, 0089_SW373_240528, 0089_SW372_240528, 0089_PW346_240528	**28-May-2024**	**----**	----	----	**10-Jun-2024**	25-Jun-2024	✓
ED093F: Dissolved Major Cations							
Clear Plastic Bottle - Natural (ED093F)							
0089_SW317_240528, 0089_SW318_240528, 0089_SW319_240528, 0089_PW375_240528, 0089_PW378_240528, 0089_PW374_240528, 0089_SW373_240528, 0089_SW372_240528, 0089_PW346_240528	**28-May-2024**	**----**	----	----	**04-Jun-2024**	04-Jun-2024	✓
Clear Plastic Bottle - Natural (ED093F)							
0089_SW406_240528, 0089_PW405_240528, 0089_PW407_240528, 0089_SW408_240528, 0089_QC109_240528, 0089_PW409_240528, 0089_SW410_240528	**28-May-2024**	**----**	----	----	**31-May-2024**	04-Jun-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
EP231A: Perfluoroalkyl Sulfonic Acids							
HDPE (no PTFE) (EP231X) 0089_SW408_240528, 0089_QC109_240528, 0089_PW409_240528, 0089_SW410_240528, 0089_SW317_240528, 0089_SW318_240528, 0089_SW319_240528, 0089_PW375_240528, 0089_PW378_240528, 0089_PW374_240528, 0089_SW373_240528, 0089_SW372_240528, 0089_PW346_240528	**28-May-2024**	**05-Jun-2024**	24-Nov-2024	✓	**05-Jun-2024**	24-Nov-2024	✓
HDPE (no PTFE) (EP231X) 0089_SW406_240528, 0089_PW405_240528, 0089_PW407_240528	**28-May-2024**	**05-Jun-2024**	24-Nov-2024	✓	**06-Jun-2024**	24-Nov-2024	✓
EP231B: Perfluoroalkyl Carboxylic Acids							
HDPE (no PTFE) (EP231X) 0089_SW408_240528, 0089_QC109_240528, 0089_PW409_240528, 0089_SW410_240528, 0089_SW317_240528, 0089_SW318_240528, 0089_SW319_240528, 0089_PW375_240528, 0089_PW378_240528, 0089_PW374_240528, 0089_SW373_240528, 0089_SW372_240528, 0089_PW346_240528	**28-May-2024**	**05-Jun-2024**	24-Nov-2024	✓	**05-Jun-2024**	24-Nov-2024	✓
HDPE (no PTFE) (EP231X) 0089_SW406_240528, 0089_PW405_240528, 0089_PW407_240528	**28-May-2024**	**05-Jun-2024**	24-Nov-2024	✓	**06-Jun-2024**	24-Nov-2024	✓
EP231C: Perfluoroalkyl Sulfonamides							
HDPE (no PTFE) (EP231X) 0089_SW408_240528, 0089_QC109_240528, 0089_PW409_240528, 0089_SW410_240528, 0089_SW317_240528, 0089_SW318_240528, 0089_SW319_240528, 0089_PW375_240528, 0089_PW378_240528, 0089_PW374_240528, 0089_SW373_240528, 0089_SW372_240528, 0089_PW346_240528	**28-May-2024**	**05-Jun-2024**	24-Nov-2024	✓	**05-Jun-2024**	24-Nov-2024	✓
HDPE (no PTFE) (EP231X) 0089_SW406_240528, 0089_PW405_240528, 0089_PW407_240528	**28-May-2024**	**05-Jun-2024**	24-Nov-2024	✓	**06-Jun-2024**	24-Nov-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) 0089_SW408_240528, 0089_QC109_240528, 0089_PW409_240528, 0089_SW410_240528, 0089_SW317_240528, 0089_SW318_240528, 0089_SW319_240528, 0089_PW375_240528, 0089_PW378_240528, 0089_PW374_240528, 0089_SW373_240528, 0089_SW372_240528, 0089_PW346_240528	**28-May-2024**	**05-Jun-2024**	24-Nov-2024	✓	**05-Jun-2024**	24-Nov-2024	✓
HDPE (no PTFE) (EP231X) 0089_SW406_240528, 0089_PW405_240528, 0089_PW407_240528	**28-May-2024**	**05-Jun-2024**	24-Nov-2024	✓	**06-Jun-2024**	24-Nov-2024	✓
EP231P: PFAS Sums							
HDPE (no PTFE) (EP231X) 0089_SW408_240528, 0089_QC109_240528, 0089_PW409_240528, 0089_SW410_240528, 0089_SW317_240528, 0089_SW318_240528, 0089_SW319_240528, 0089_PW375_240528, 0089_PW378_240528, 0089_PW374_240528, 0089_SW373_240528, 0089_SW372_240528, 0089_PW346_240528	**28-May-2024**	**05-Jun-2024**	24-Nov-2024	✓	**05-Jun-2024**	24-Nov-2024	✓
HDPE (no PTFE) (EP231X) 0089_SW406_240528, 0089_PW405_240528, 0089_PW407_240528	**28-May-2024**	**05-Jun-2024**	24-Nov-2024	✓	**06-Jun-2024**	24-Nov-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)							
Alkalinity by Auto Titrator	ED037-P	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	4	36	**11.11**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	6	48	**12.50**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	6	60	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	4	40	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Alkalinity by Auto Titrator	ED037-P	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	4	36	**11.11**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	3	48	**6.25**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	3	60	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	4	40	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Alkalinity by Auto Titrator	ED037-P	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	36	**5.56**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	3	48	**6.25**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	3	60	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	40	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Chloride by Discrete Analyser	ED045G	2	36	**5.56**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	3	60	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	40	**5.00**	**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
Alkalinity by Auto Titrator	ED037-P	WATER	In house: Referenced to APHA 2320 B This procedure determines alkalinity by automated measurement (e.g. PC Titrate) on a settled supernatant aliquot of the sample using pH 4.5 for indicating the total alkalinity end-point. This method is compliant with NEPM Schedule B(3)
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	WATER	In house: Referenced to APHA 4500-SO4. Dissolved sulfate is determined in a 0.45um filtered sample. Sulfate ions are converted to a barium sulfate suspension in an acetic acid medium with barium chloride. Light absorbance of the BaSO4 suspension is measured by a photometer and the SO4-2 concentration is determined by comparison of the reading with a standard curve. This method is compliant with NEPM Schedule B(3)
Chloride by Discrete Analyser	ED045G	WATER	In house: Referenced to APHA 4500 Cl - G.The thiocyanate ion is liberated from mercuric thiocyanate through sequestration of mercury by the chloride ion to form non-ionised mercuric chloride. In the presence of ferric ions the liberated thiocynate forms highly-coloured ferric thiocynate which is measured at 480 nm.
Major Cations - Dissolved	ED093F	WATER	In house: Referenced to APHA 3120 and 3125; USEPA SW 846 - 6010 and 6020; Cations are determined by either ICP-AES or ICP-MS techniques. This method is compliant with NEPM Schedule B(3) Sodium Adsorption Ratio is calculated from Ca, Mg and Na which determined by ALS in house method QWI-EN/ED093F. This method is compliant with NEPM Schedule B(3) Hardness parameters are calculated based on APHA 2340 B. This method is compliant with NEPM Schedule B(3)
Ionic Balance by PCT DA and Turbi SO4 DA	* EN055 - PG	WATER	In house: Referenced to APHA 1030F. This method is compliant with NEPM Schedule B(3)
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.

ALSCompass
SAMPLING *Intelligence*

ALS

Perth
Work Order Reference
EP2407417

Telephone -- 61-8-9406 1301

Custody Document for Submissions via ALS Compass App

Project: WA-0089-PFASDTP-24 Client: STANTEC Project Manager: [redacted]

Phone: ( ) [redacted]

ALS Compass COC Reference: 68323 68318 68334 68335 68326 68324 # Samples: 68325 Sampler:

Phone: ( ) [redacted]

Turnaround Requirements: Standard _____ Urgent _____

Special Instructions:

Custody:

Relinquished by:	Received by:	Relinquished by:	Received by:
STANTEC	[redacted]		
Date / Time: 29/5/24	Date / Time: 30/5 1215	Date / Time:	Date / Time:

CHAIN OF CUSTODY

COC#: 68318 *ALS Laboratory:* EP Perth Environmental

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

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP_24

SITE: Stirling GW - MB

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted] derp.labreports@esdat.com.au

EMAIL INVOICES 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	WA OMP Water Suite WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
001	0089_MW010		29/05/2024 08:26 AM	WATER	ALS: 3 Non ALS: 0	No	X		
002	0089_MW553		29/05/2024 08:27 AM	WATER	ALS: 3 Non ALS: 0	No	X		
003	0089_MW269		29/05/2024 08:54 AM	WATER	ALS: 5 Non ALS: 0	No	X		Extra pfas bottles for lab qc
004	0089_MW516		29/05/2024 09:27 AM	WATER	ALS: 3 Non ALS: 0	No	X		
005	0089_MW496		29/05/2024 09:28 AM	WATER	ALS: 3 Non ALS: 0	No	X		
006	0089_MW249		29/05/2024 09:39 AM	WATER	ALS: 5 Non ALS: 0	No	X		Extra bottles for lab qc
007	0089_MW245		29/05/2024 10:50 AM	WATER	ALS: 3 Non ALS: 0	No	X		

CHAIN OF CUSTODY

COC#: 68318 *ALS Laboratory:* EP Perth Environmental

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP_24

SITE: Stirling GW - MB

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted]

SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted] derp.labreports@esdat.com.au

EMAIL INVOICES TO: [redacted]

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

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	WA OMP Water Suite WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
008	0089_MW243		29/05/2024 11:00 AM	WATER	ALS: 3 Non ALS: 0	No	X		
009	0089_MW240		29/05/2024 11:10 AM	WATER	ALS: 3 Non ALS: 0	No	X		
010	0089_MW238		29/05/2024 11:21 AM	WATER	ALS: 3 Non ALS: 0	No	X		
011	0089_MW239		29/05/2024 11:37 AM	WATER	ALS: 3 Non ALS: 0	No	X		

CHAIN OF CUSTODY

COC#: 68318 ALS Laboratory: EP Perth Environmental

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

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP_24

SITE: Stirling GW - MB

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted] derp.labreports@esdat.com.au

EMAIL INVOICES 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	0089_MW010	HDPE (no PTFE)	20 mL	00352312048735	Grey	No	
001	0089_MW010	HDPE (no PTFE)	20 mL	00352312048752	Grey	No	
001	0089_MW010	Clear Plastic Bottle - Natural	125 mL	00071121178017	Green	No	
002	0089_MW553	HDPE (no PTFE)	20 mL	00351221024870	Grey	No	
002	0089_MW553	HDPE (no PTFE)	20 mL	00352312048466	Grey	No	
002	0089_MW553	Clear Plastic Bottle - Natural	125 mL	00071121177926	Green	No	
003	0089_MW269	HDPE (no PTFE)	20 mL	00351221024728	Grey	No	
003	0089_MW269	HDPE (no PTFE)	20 mL	00352312048652	Grey	No	
003	0089_MW269	HDPE (no PTFE)	20 mL	00351221027254	Grey	No	
003	0089_MW269	HDPE (no PTFE)	20 mL	00351221027318	Grey	No	
003	0089_MW269	Clear Plastic Bottle - Natural	125 mL	00071121160983	Green	No	
004	0089_MW516	Clear Plastic Bottle - Natural	125 mL	00071121178082	Green	No	
004	0089_MW516	HDPE (no PTFE)	20 mL	00352312048780	Grey	No	
004	0089_MW516	HDPE (no PTFE)	20 mL	00351221024735	Grey	No	
005	0089_MW496	Clear Plastic Bottle - Natural	125 mL	00071121160998	Green	No	
005	0089_MW496	HDPE (no PTFE)	20 mL	00352312048640	Grey	No	
005	0089_MW496	HDPE (no PTFE)	20 mL	00351221024724	Grey	No	
006	0089_MW249	Clear Plastic Bottle - Natural	125 mL	00071121178084	Green	No	
006	0089_MW249	HDPE (no PTFE)	20 mL	00351221027230	Grey	No	
006	0089_MW249	HDPE (no PTFE)	20 mL	00351221027388	Grey	No	
006	0089_MW249	HDPE (no PTFE)	20 mL	00351221024812	Grey	No	
006	0089_MW249	HDPE (no PTFE)	20 mL	00351221024635	Grey	No	
007	0089_MW245	Clear Plastic Bottle - Natural	125 mL	00071121178113	Green	No	
007	0089_MW245	HDPE (no PTFE)	20 mL	00352312048791	Grey	No	
007	0089_MW245	HDPE (no PTFE)	20 mL	00352312048767	Grey	No	
008	0089_MW243	Clear Plastic Bottle - Natural	125 mL	00071121177952	Green	No	

CHAIN OF CUSTODY

COC#: 68318 *ALS Laboratory:* EP Perth Environmental

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP_24

SITE: Stirling GW - MB

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]s

PRIMARY SAMPLER: [redacted]s

CONTACT PH: [redacted]

QUOTE NO: SY/139/19 B

SAMPLER MOBILE: [redacted]

/ ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]derp.labreports@esdat.com.au

EMAIL INVOICES TO: [redacted]

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

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:

008	0089_MW243	HDPE (no PTFE)	20 mL	00352312048675	Grey	No	
008	0089_MW243	HDPE (no PTFE)	20 mL	00351221024734	Grey	No	
009	0089_MW240	Clear Plastic Bottle - Natural	125 mL	00071121177957	Green	No	
009	0089_MW240	HDPE (no PTFE)	20 mL	00351221024632	Grey	No	
009	0089_MW240	HDPE (no PTFE)	20 mL	00351221024647	Grey	No	
010	0089_MW238	Clear Plastic Bottle - Natural	125 mL	00070821217724	Green	No	
010	0089_MW238	HDPE (no PTFE)	20 mL	00352312048732	Grey	No	
010	0089_MW238	HDPE (no PTFE)	20 mL	00351221024769	Grey	No	
011	0089_MW239	Clear Plastic Bottle - Natural	125 mL	00071121160990	Green	No	
011	0089_MW239	HDPE (no PTFE)	20 mL	00351221024803	Grey	No	
011	0089_MW239	HDPE (no PTFE)	20 mL	00351221024806	Grey	No	

Total Bottle Count: ALS: 37, Non ALS: 0

SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : **EP2407417**

Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: [redacted]
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
E-mail	: [redacted]stantec.com	E-mail	: [redacted]alsglobal.com
Telephone	: ----	Telephone	: +61-8-9406 1301
Facsimile	: ----	Facsimile	: +61-8-9406 1399
Project	: WA_0089_PFASOMP_24	Page	: 1 of 2
Order number	: pfas-omp/Stirling	Quote number	: ES2022MWHAUS0002 (SY/139/19 B)
C-O-C number	: 68318	QC Level	: NEPM 2013 B3 & ALS QC Standard
Site	: Stirling GW - MB		
Sampler	: [redacted]		

Dates

Date Samples Received	: 30-May-2024 12:15	Issue Date	: 31-May-2024
Client Requested Due Date	: 11-Jun-2024	Scheduled Reporting Date	: **11-Jun-2024**

Delivery Details

Mode of Delivery	: Carrier	Security Seal	: Not Available
No. of coolers/boxes	: 2	Temperature	: 16.7 - Ice present
Receipt Detail	:	No. of samples received / analysed	: 11 / 11

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 see scanned COC for sample discrepencies: extra samples , samples not received etc.
- Please direct any queries related to sample condition / numbering / breakages to Sample Receipt (Samples.Perth@alsglobal.com)
- Analytical work for this work order will be conducted at ALS Environmental Perth.
- Please direct any turnaround / technical queries to the laboratory contact designated above.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months) from receipt of samples.
- **pH analysis should be conducted within 6 hours of sampling.**
- **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.**
- 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 (30 analytes)	WATER - NT-01 & 02 Ca, Mg, Na, K, Cl, SO4, Alkalinity
EP2407417-001	29-May-2024 08:26	0089_MW010_240529	✓	✓
EP2407417-002	29-May-2024 08:27	0089_MW553_240529	✓	✓
EP2407417-003	29-May-2024 08:54	0089_MW269_240529	✓	✓
EP2407417-004	29-May-2024 09:27	0089_MW516_240529	✓	✓
EP2407417-005	29-May-2024 09:28	0089_MW496_240529	✓	✓
EP2407417-006	29-May-2024 09:39	0089_MW249_240529	✓	✓
EP2407417-007	29-May-2024 10:50	0089_MW245_240529	✓	✓
EP2407417-008	29-May-2024 11:00	0089_MW243_240529	✓	✓
EP2407417-009	29-May-2024 11:10	0089_MW240_240529	✓	✓
EP2407417-010	29-May-2024 11:21	0089_MW238_240529	✓	✓
EP2407417-011	29-May-2024 11:37	0089_MW239_240529	✓	✓

Proactive Holding Time Report

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

Requested Deliverables

[redacted]
- A4 - AU Tax Invoice (INV) — Email — [redacted]cardno.com.au

DERP LAB REPORTS
- EDI Format - ESDAT (ESDAT) — Email — derp.labreports@esdat.com.au

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

CERTIFICATE OF ANALYSIS

Work Order	: **EP2407417**	Page	: 1 of 12
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: [redacted]
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: +61-8-9406 1301
Project	: WA_0089_PFASOMP_24	Date Samples Received	: 30-May-2024 12:15
Order number	: pfas-omp/Stirling	Date Analysis Commenced	: 31-May-2024
C-O-C number	: 68318	Issue Date	: 11-Jun-2024 16:52
Sampler	: [redacted]		
Site	: Stirling GW - MB		
Quote number	: SY/139/19 B		
No. of samples received	: 11		
No. of samples analysed	: 11		

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]	Laboratory Manager (Perth)	Perth Inorganics, Wangara, WA
[redacted]	Senior Organic Chemist	Perth Organics, Wangara, WA

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.
- As per QWI – EN55-3 Data Interpreting Procedures, Ionic balances are typically calculated using Major Anions - Chloride, Alkalinity and Sulfate; and Major Cations - Calcium, Magnesium, Potassium and Sodium. Where applicable and dependent upon sample matrix, the Ionic Balance may also include the additional contribution of Ammonia, Dissolved Metals by ICPMS and H+ to the Cations and Nitrate, SiO2 and Fluoride to the Anions.
- EP231X: The LOR of PFBA and PFPeA has been raised on sample '0089_MW516_240529' (EP2407417-004) due to sample matrix interferences.
- ED041G (Sulfate Turbidimetric): LOR for sample EP2407417-004 raised due to possible sample matrix interference.
- Sodium Adsorption Ratio (where reported): Where results for Na, Ca or Mg are <LOR, a concentration at half the reported LOR is incorporated into the SAR calculation. This represents a conservative approach for Na relative to the assumption that <LOR = zero concentration and a conservative approach for Ca & Mg relative to the assumption that <LOR is equivalent to the LOR concentration.
- 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.
- ED045G: The presence of Thiocyanate, Thiosulfate and Sulfite can positively contribute to the chloride result, thereby may bias results higher than expected. Results should be scrutinised accordingly.

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW010_240529	0089_MW553_240529	0089_MW269_240529	0089_MW516_240529	0089_MW496_240529
				Sampling date / time	29-May-2024 08:26	29-May-2024 08:27	29-May-2024 08:54	29-May-2024 09:27	29-May-2024 09:28
Compound	CAS Number	LOR	Unit		EP2407417-001	EP2407417-002	EP2407417-003	EP2407417-004	EP2407417-005
					Result	Result	Result	Result	Result
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	<1	<1	<1	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	<1	<1	<1	<1
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		317	461	450	548	465
Total Alkalinity as CaCO3	----	1	mg/L		317	461	450	548	465
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		52	91	106	<5	49
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		190	153	328	90	212
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		101	148	91	93	86
Magnesium	7439-95-4	1	mg/L		19	26	65	72	43
Sodium	7440-23-5	1	mg/L		117	109	160	70	167
Potassium	7440-09-7	1	mg/L		10	11	15	11	17
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		12.8	15.4	20.4	13.5	16.3
ø Total Cations	----	0.01	meq/L		11.9	14.5	17.2	13.9	15.5
ø Ionic Balance	----	0.01	%		3.35	2.92	8.54	1.48	2.39
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		<0.02	<0.02	0.10	<0.02	0.06
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		<0.02	<0.02	0.13	0.03	0.07
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		0.02	0.01	0.79	0.64	1.07
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		<0.02	<0.02	<0.02	0.06	0.07
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		<0.01	<0.01	0.31	8.69	6.76
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW010_240529	0089_MW553_240529	0089_MW269_240529	0089_MW516_240529	0089_MW496_240529
				Sampling date / time	29-May-2024 08:26	29-May-2024 08:27	29-May-2024 08:54	29-May-2024 09:27	29-May-2024 09:28
Compound	CAS Number	LOR	Unit		EP2407417-001	EP2407417-002	EP2407417-003	EP2407417-004	EP2407417-005
					Result	Result	Result	Result	Result
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		<0.1	<0.1	<0.1	<0.3	<0.1
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		<0.02	<0.02	**0.04**	<0.05	**0.03**
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		<0.02	<0.02	**0.19**	**0.06**	**0.17**
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		<0.02	<0.02	**0.02**	<0.02	**0.04**
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		<0.01	<0.01	**0.02**	**0.04**	**0.10**
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
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									

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW010_240529	0089_MW553_240529	0089_MW269_240529	0089_MW516_240529	0089_MW496_240529
				Sampling date / time	29-May-2024 08:26	29-May-2024 08:27	29-May-2024 08:54	29-May-2024 09:27	29-May-2024 09:28
Compound	CAS Number	LOR	Unit		EP2407417-001	EP2407417-002	EP2407417-003	EP2407417-004	EP2407417-005
					Result	Result	Result	Result	Result
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
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**	**0.01**	**1.60**	**9.54**	**8.62**
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		**0.02**	**0.01**	**1.10**	**9.33**	**7.83**
Sum of PFAS (WA DER List)	----	0.01	µg/L		**0.02**	**0.01**	**1.47**	**9.43**	**8.23**
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**101**	**105**	**104**	**103**	**98.2**
13C8-PFOA	----	0.02	%		**95.8**	**90.5**	**90.4**	**98.1**	**98.2**

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW249_240529	0089_MW245_240529	0089_MW243_240529	0089_MW240_240529	0089_MW238_240529
				Sampling date / time	29-May-2024 09:39	29-May-2024 10:50	29-May-2024 11:00	29-May-2024 11:10	29-May-2024 11:21
Compound	CAS Number	LOR	Unit		EP2407417-006	EP2407417-007	EP2407417-008	EP2407417-009	EP2407417-010
					Result	Result	Result	Result	Result
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	<1	<1	<1	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	<1	<1	<1	<1
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		**430**	**182**	**298**	**263**	**234**
Total Alkalinity as CaCO3	----	1	mg/L		**430**	**182**	**298**	**263**	**234**
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		**50**	<1	**79**	**68**	**83**
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		**197**	**16**	**52**	**54**	**46**
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		**102**	**56**	**124**	**120**	**95**
Magnesium	7439-95-4	1	mg/L		**41**	**7**	**17**	**15**	**18**
Sodium	7440-23-5	1	mg/L		**134**	**22**	**40**	**32**	**33**
Potassium	7440-09-7	1	mg/L		**10**	**3**	**9**	**4**	**4**
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		**15.2**	**4.09**	**9.06**	**8.19**	**7.70**
ø Total Cations	----	0.01	meq/L		**14.5**	**4.40**	**9.56**	**8.72**	**7.76**
ø Ionic Balance	----	0.01	%		**2.16**	**3.73**	**2.64**	**3.09**	**0.38**
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		**0.24**	<0.01	<0.01	**0.03**	**0.14**
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**	<0.01	<0.01	**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

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW249_240529	0089_MW245_240529	0089_MW243_240529	0089_MW240_240529	0089_MW238_240529
				Sampling date / time	29-May-2024 09:39	29-May-2024 10:50	29-May-2024 11:00	29-May-2024 11:10	29-May-2024 11:21
Compound	CAS Number	LOR	Unit		EP2407417-006	EP2407417-007	EP2407417-008	EP2407417-009	EP2407417-010
					Result	Result	Result	Result	Result
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
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									

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW249_240529	0089_MW245_240529	0089_MW243_240529	0089_MW240_240529	0089_MW238_240529
				Sampling date / time	29-May-2024 09:39	29-May-2024 10:50	29-May-2024 11:00	29-May-2024 11:10	29-May-2024 11:21
Compound	CAS Number	LOR	Unit		EP2407417-006	EP2407417-007	EP2407417-008	EP2407417-009	EP2407417-010
					Result	Result	Result	Result	Result
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
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		**0.26**	<0.01	<0.01	**0.05**	**0.16**
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		**0.26**	<0.01	<0.01	**0.05**	**0.14**
Sum of PFAS (WA DER List)	----	0.01	µg/L		**0.26**	<0.01	<0.01	**0.05**	**0.16**
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**105**	**103**	**105**	**104**	**110**
13C8-PFOA	----	0.02	%		**94.6**	**98.7**	**94.7**	**94.4**	**96.9**

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW239_240529	----	----	----	----
				Sampling date / time	29-May-2024 11:37	----	----	----	----
Compound	CAS Number	LOR	Unit		EP2407417-011	--------	--------	--------	--------
					Result	----	----	----	----
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	----	----	----	----
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	----	----	----	----
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		**234**	----	----	----	----
Total Alkalinity as CaCO3	----	1	mg/L		**234**	----	----	----	----
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		**90**	----	----	----	----
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		**42**	----	----	----	----
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		**105**	----	----	----	----
Magnesium	7439-95-4	1	mg/L		**20**	----	----	----	----
Sodium	7440-23-5	1	mg/L		**31**	----	----	----	----
Potassium	7440-09-7	1	mg/L		**3**	----	----	----	----
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		**7.73**	----	----	----	----
ø Total Cations	----	0.01	meq/L		**8.31**	----	----	----	----
ø Ionic Balance	----	0.01	%		**3.60**	----	----	----	----
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		**0.10**	----	----	----	----
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	----	----	----	----

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW239_240529	----	----	----	----
				Sampling date / time	29-May-2024 11:37	----	----	----	----
Compound	CAS Number	LOR	Unit		EP2407417-011	--------	--------	--------	--------
					Result	----	----	----	----
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	----	----	----	----
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									

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW239_240529	----	----	----	----
				Sampling date / time	29-May-2024 11:37	----	----	----	----
Compound	CAS Number	LOR	Unit		EP2407417-011	--------	--------	--------	--------
					Result	----	----	----	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
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		**0.10**	----	----	----	----
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		**0.10**	----	----	----	----
Sum of PFAS (WA DER List)	----	0.01	µg/L		**0.10**	----	----	----	----
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**112**	----	----	----	----
13C8-PFOA	----	0.02	%		**96.7**	----	----	----	----

Surrogate Control Limits

Sub-Matrix: **GROUNDWATER**		Recovery Limits (%)	
Compound	*CAS Number*	*Low*	*High*
EP231S: PFAS Surrogate			
13C4-PFOS	----	65	140
13C8-PFOA	----	71	133

QUALITY CONTROL REPORT

Work Order	: **EP2407417**	Page	: 1 of 13
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: [redacted]
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: +61-8-9406 1301
Project	: WA_0089_PFASOMP_24	Date Samples Received	: 30-May-2024
Order number	: pfas-omp/Stirling	Date Analysis Commenced	: 31-May-2024
C-O-C number	: 68318	Issue Date	: 11-Jun-2024
Sampler	: [redacted]		
Site	: Stirling GW - MB		
Quote number	: SY/139/19 B		
No. of samples received	: 11		
No. of samples analysed	: 11		

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]	Laboratory Manager (Perth)	Perth Inorganics, Wangara, WA
[redacted]	Senior Organic Chemist	Perth Organics, Wangara, WA

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 (%)
ED037P: Alkalinity by PC Titrator (QC Lot: 5837282)									
EP2407411-002	Anonymous	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	706	703	0.3	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	706	703	0.3	0% - 20%
EP2407417-005	0089_MW496_240529	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	465	465	0.0	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	465	465	0.0	0% - 20%
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QC Lot: 5829568)									
EP2407417-001	0089_MW010_240529	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	52	52	0.0	0% - 20%
EP2407417-011	0089_MW239_240529	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	90	91	0.0	0% - 20%
ED045G: Chloride by Discrete Analyser (QC Lot: 5829569)									
EP2407417-001	0089_MW010_240529	ED045G: Chloride	16887-00-6	1	mg/L	190	185	2.5	0% - 20%
EP2407417-011	0089_MW239_240529	ED045G: Chloride	16887-00-6	1	mg/L	42	42	0.0	0% - 20%
ED093F: Dissolved Major Cations (QC Lot: 5833495)									
EP2407411-001	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	211	210	0.0	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	533	531	0.5	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	3630	3600	0.7	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	183	183	0.0	0% - 20%
EP2407417-005	0089_MW496_240529	ED093F: Calcium	7440-70-2	1	mg/L	86	85	1.6	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	43	41	4.1	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	167	168	0.6	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 (%)*
ED093F: Dissolved Major Cations (QC Lot: 5833495) - continued									
EP2407417-005	0089_MW496_240529	ED093F: Potassium	7440-09-7	1	mg/L	17	17	0.0	0% - 50%
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 5835276)									
EP2407413-004	Anonymous	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
EP2407413-015	Anonymous	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	0.04	0.02	67.4	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: 5835299)									
EP2407413-009	Anonymous	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	0.02	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
EP2407417-006	0089_MW249_240529	EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	0.24	0.23	0.0	0% - 20%
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	0.02	0.02	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
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 5835276)									
EP2407413-004	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

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: 5835276) - continued									
EP2407413-004	Anonymous	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
EP2407413-015	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
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 5835299)									
EP2407413-009	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
EP2407417-006	0089_MW249_240529	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: 5835276)									

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: 5835276) - continued									
EP2407413-004	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
EP2407413-015	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
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 5835299)									
EP2407413-009	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
EP2407417-006	0089_MW249_240529	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: 5835299) - continued									
EP2407417-006	0089_MW249_240529	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: 5835276)									
EP2407413-004	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
EP2407413-015	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
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 5835299)									
EP2407413-009	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
EP2407417-006	0089_MW249_240529	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: 5835299) - continued									
EP2407417-006	0089_MW249_240529	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: 5835276)									
EP2407413-004	Anonymous	EP231X: Sum of PFAS	----	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	<0.01	<0.01	0.0	No Limit
EP2407413-015	Anonymous	EP231X: Sum of PFAS	----	0.01	µg/L	0.04	0.02	66.7	No Limit
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	0.04	0.02	66.7	No Limit
		EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	0.04	0.02	66.7	No Limit
EP231P: PFAS Sums (QC Lot: 5835299)									
EP2407413-009	Anonymous	EP231X: Sum of PFAS	----	0.01	µg/L	0.02	0.01	66.7	No Limit
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	0.02	0.01	66.7	No Limit
		EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	0.02	0.01	66.7	No Limit
EP2407417-006	0089_MW249_240529	EP231X: Sum of PFAS	----	0.01	µg/L	0.26	0.25	3.9	0% - 20%
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	0.26	0.25	3.9	0% - 20%
		EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	0.26	0.25	3.9	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
ED037P: Alkalinity by PC Titrator (QCLot: 5837282)								
ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	----	----	----	----
ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	----	----	----	----
ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	<1	----	----	----	----
ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	<1	20 mg/L	100	85.1	126
				<1	200 mg/L	100	90.5	111
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 5829568)								
ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<1	25 mg/L	101	89.9	112
				<1	500 mg/L	90.1	89.9	112
ED045G: Chloride by Discrete Analyser (QCLot: 5829569)								
ED045G: Chloride	16887-00-6	1	mg/L	<1	10 mg/L	97.5	88.6	113
				<1	1000 mg/L	106	88.6	113
ED093F: Dissolved Major Cations (QCLot: 5833495)								
ED093F: Calcium	7440-70-2	1	mg/L	<1	50 mg/L	101	86.5	117
ED093F: Magnesium	7439-95-4	1	mg/L	<1	50 mg/L	99.1	88.4	110
ED093F: Sodium	7440-23-5	1	mg/L	<1	50 mg/L	98.2	91.4	113
ED093F: Potassium	7440-09-7	1	mg/L	<1	50 mg/L	95.1	84.6	108
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5835276)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.2218 µg/L	96.0	72.0	130
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.2352 µg/L	108	71.0	127
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	0.2373 µg/L	97.3	68.0	131
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.238 µg/L	101	69.0	134
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.232 µg/L	97.8	65.0	140
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.241 µg/L	91.7	53.0	142
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5835299)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.2218 µg/L	89.5	72.0	130
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.2352 µg/L	91.2	71.0	127
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	0.2373 µg/L	93.3	68.0	131
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.238 µg/L	102	69.0	134
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.232 µg/L	78.4	65.0	140
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.241 µg/L	79.5	53.0	142

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: 5835276)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	1.25 µg/L	103	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	99.2	72.0	129
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	0.25 µg/L	103	72.0	130
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	0.25 µg/L	97.4	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	97.8	71.0	129
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	0.25 µg/L	103	69.0	133
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	0.25 µg/L	101	72.0	134
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	0.25 µg/L	110	65.0	144
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	0.25 µg/L	106	71.0	132
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5835299)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	1.25 µg/L	93.6	73.0	129
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	0.25 µg/L	97.8	72.0	129
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	0.25 µg/L	99.6	72.0	129
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	0.25 µg/L	88.2	72.0	130
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	0.25 µg/L	94.8	71.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	0.25 µg/L	85.4	69.0	130
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	0.25 µg/L	88.8	71.0	129
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	0.25 µg/L	111	69.0	133
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	0.25 µg/L	88.0	72.0	134
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	0.25 µg/L	95.8	65.0	144
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	0.25 µg/L	98.4	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5835276)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.25 µg/L	105	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	0.625 µg/L	108	68.0	141
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	0.625 µg/L	98.4	60.5	138
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	0.625 µg/L	104	68.3	134
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	0.625 µg/L	112	62.2	138
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	0.25 µg/L	102	65.0	136
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	0.25 µg/L	104	61.0	135

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
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5835299)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.25 µg/L	86.2	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	0.625 µg/L	108	68.0	141
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	0.625 µg/L	99.4	60.5	138
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	0.625 µg/L	96.7	68.3	134
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	0.625 µg/L	101	62.2	138
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	0.25 µg/L	96.8	65.0	136
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	0.25 µg/L	80.4	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5835276)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.2343 µg/L	108	63.0	143
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	0.2378 µg/L	109	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	0.24 µg/L	110	67.0	138
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	0.241 µg/L	113	64.2	133
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5835299)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.2343 µg/L	93.7	63.0	143
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	0.2378 µg/L	84.7	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	0.24 µg/L	88.8	67.0	138
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	0.241 µg/L	86.3	64.2	133
EP231P: PFAS Sums (QCLot: 5835276)								
EP231X: Sum of PFAS	----	0.01	µg/L	<0.01	----	----	----	----
EP231X: Sum of PFHxS and PFOS	355-46-4/17 63-23-1	0.01	µg/L	<0.01	----	----	----	----
EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	<0.01	----	----	----	----
EP231P: PFAS Sums (QCLot: 5835299)								
EP231X: Sum of PFAS	----	0.01	µg/L	<0.01	----	----	----	----
EP231X: Sum of PFHxS and PFOS	355-46-4/17 63-23-1	0.01	µg/L	<0.01	----	----	----	----
EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	<0.01	----	----	----	----

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**

Matrix Spike (MS) Report

Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 5829568)							
EP2407417-001	0089_MW010_240529	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	100 mg/L	117	70.4	130
ED045G: Chloride by Discrete Analyser (QCLot: 5829569)							
EP2407417-001	0089_MW010_240529	ED045G: Chloride	16887-00-6	200 mg/L	107	70.0	130
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5835276)							
EP2407413-014	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.2218 µg/L	93.7	72.0	129
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.232 µg/L	98.9	71.0	127
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.2352 µg/L	89.6	68.0	129
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.238 µg/L	101	69.0	134
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.232 µg/L	90.4	65.0	140
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.241 µg/L	85.7	53.0	129
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5835299)							
EP2407417-003	0089_MW269_240529	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.2218 µg/L	81.5	72.0	129
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.232 µg/L	90.5	71.0	127
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.2352 µg/L	83.6	68.0	129
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.238 µg/L	104	69.0	134
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.232 µg/L	73.6	65.0	140
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.241 µg/L	92.3	53.0	129
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5835276)							
EP2407413-014	Anonymous	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	1.25 µg/L	101	73.0	142
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.25 µg/L	100	72.0	129
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.25 µg/L	105	72.0	129
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.25 µg/L	102	72.0	130
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.25 µg/L	100	71.0	133
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.25 µg/L	99.2	69.0	130
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.25 µg/L	98.4	71.0	134
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.25 µg/L	102	69.0	133
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.25 µg/L	106	72.0	134
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.25 µg/L	121	65.0	144
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.25 µg/L	100	71.0	132
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5835299)							
EP2407417-003	0089_MW269_240529	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	1.25 µg/L	92.4	73.0	142
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.25 µg/L	100.0	72.0	129
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.25 µg/L	105	72.0	129
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.25 µg/L	88.1	72.0	130
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.25 µg/L	92.7	71.0	133
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.25 µg/L	102	69.0	130
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.25 µg/L	93.0	71.0	134
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.25 µg/L	103	69.0	133

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: 5835299) - continued							
EP2407417-003	0089_MW269_240529	EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.25 µg/L	93.6	72.0	134
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.25 µg/L	96.8	65.0	144
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.25 µg/L	93.1	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5835276)							
EP2407413-014	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.25 µg/L	101	59.0	135
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.625 µg/L	110	70.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.625 µg/L	105	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.625 µg/L	109	70.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.625 µg/L	106	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.25 µg/L	90.0	65.0	136
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.25 µg/L	93.9	61.0	135
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5835299)							
EP2407417-003	0089_MW269_240529	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.25 µg/L	84.0	59.0	135
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.625 µg/L	98.8	70.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.625 µg/L	114	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.625 µg/L	99.7	70.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.625 µg/L	100	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.25 µg/L	89.8	65.0	136
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.25 µg/L	96.6	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5835276)							
EP2407413-014	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.234 µg/L	98.9	63.0	143
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.2378 µg/L	114	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.24 µg/L	98.8	67.0	138
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.2415 µg/L	92.6	70.0	130
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5835299)							
EP2407417-003	0089_MW269_240529	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.234 µg/L	96.6	63.0	143
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.2378 µg/L	101	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.24 µg/L	93.6	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: 5835299) - continued							
EP2407417-003	0089_MW269_240529	EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.2415 µg/L	89.7	70.0	130

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **EP2407417**	Page	: 1 of 5
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Telephone	: +61-8-9406 1301
Project	: WA_0089_PFASOMP_24	Date Samples Received	: 30-May-2024
Site	: Stirling GW - MB	Issue Date	: 11-Jun-2024
Sampler	: [redacted]	No. of samples received	: 11
Order number	: pfas-omp/Stirling	No. of samples analysed	: 11

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, where applicable to the methodology, 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
ED037P: Alkalinity by PC Titrator							
Clear Plastic Bottle - Natural (ED037-P)							
0089_MW010_240529, 0089_MW553_240529, 0089_MW269_240529, 0089_MW516_240529, 0089_MW496_240529, 0089_MW249_240529, 0089_MW245_240529, 0089_MW243_240529, 0089_MW240_240529, 0089_MW238_240529, 0089_MW239_240529	**29-May-2024**	**----**	----	----	**05-Jun-2024**	12-Jun-2024	✓
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA							
Clear Plastic Bottle - Natural (ED041G)							
0089_MW010_240529, 0089_MW553_240529, 0089_MW269_240529, 0089_MW516_240529, 0089_MW496_240529, 0089_MW249_240529, 0089_MW245_240529, 0089_MW243_240529, 0089_MW240_240529, 0089_MW238_240529, 0089_MW239_240529	**29-May-2024**	**----**	----	----	**11-Jun-2024**	26-Jun-2024	✓
ED045G: Chloride by Discrete Analyser							
Clear Plastic Bottle - Natural (ED045G)							
0089_MW010_240529, 0089_MW553_240529, 0089_MW269_240529, 0089_MW516_240529, 0089_MW496_240529, 0089_MW249_240529, 0089_MW245_240529, 0089_MW243_240529, 0089_MW240_240529, 0089_MW238_240529, 0089_MW239_240529	**29-May-2024**	**----**	----	----	**11-Jun-2024**	26-Jun-2024	✓
ED093F: Dissolved Major Cations							
Clear Plastic Bottle - Natural (ED093F)							
0089_MW010_240529, 0089_MW553_240529, 0089_MW269_240529, 0089_MW516_240529, 0089_MW496_240529, 0089_MW249_240529, 0089_MW245_240529, 0089_MW243_240529, 0089_MW240_240529, 0089_MW238_240529, 0089_MW239_240529	**29-May-2024**	**----**	----	----	**04-Jun-2024**	05-Jun-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
EP231A: Perfluoroalkyl Sulfonic Acids							
HDPE (no PTFE) (EP231X)							
0089_MW010_240529, 0089_MW553_240529, 0089_MW269_240529, 0089_MW516_240529, 0089_MW496_240529, 0089_MW249_240529, 0089_MW245_240529, 0089_MW243_240529, 0089_MW240_240529, 0089_MW238_240529, 0089_MW239_240529	**29-May-2024**	**05-Jun-2024**	25-Nov-2024	✓	**05-Jun-2024**	25-Nov-2024	✓
EP231B: Perfluoroalkyl Carboxylic Acids							
HDPE (no PTFE) (EP231X)							
0089_MW010_240529, 0089_MW553_240529, 0089_MW269_240529, 0089_MW516_240529, 0089_MW496_240529, 0089_MW249_240529, 0089_MW245_240529, 0089_MW243_240529, 0089_MW240_240529, 0089_MW238_240529, 0089_MW239_240529	**29-May-2024**	**05-Jun-2024**	25-Nov-2024	✓	**05-Jun-2024**	25-Nov-2024	✓
EP231C: Perfluoroalkyl Sulfonamides							
HDPE (no PTFE) (EP231X)							
0089_MW010_240529, 0089_MW553_240529, 0089_MW269_240529, 0089_MW516_240529, 0089_MW496_240529, 0089_MW249_240529, 0089_MW245_240529, 0089_MW243_240529, 0089_MW240_240529, 0089_MW238_240529, 0089_MW239_240529	**29-May-2024**	**05-Jun-2024**	25-Nov-2024	✓	**05-Jun-2024**	25-Nov-2024	✓
EP231D: (n:2) Fluorotelomer Sulfonic Acids							
HDPE (no PTFE) (EP231X)							
0089_MW010_240529, 0089_MW553_240529, 0089_MW269_240529, 0089_MW516_240529, 0089_MW496_240529, 0089_MW249_240529, 0089_MW245_240529, 0089_MW243_240529, 0089_MW240_240529, 0089_MW238_240529, 0089_MW239_240529	**29-May-2024**	**05-Jun-2024**	25-Nov-2024	✓	**05-Jun-2024**	25-Nov-2024	✓
EP231P: PFAS Sums							
HDPE (no PTFE) (EP231X)							
0089_MW010_240529, 0089_MW553_240529, 0089_MW269_240529, 0089_MW516_240529, 0089_MW496_240529, 0089_MW249_240529, 0089_MW245_240529, 0089_MW243_240529, 0089_MW240_240529, 0089_MW238_240529, 0089_MW239_240529	**29-May-2024**	**05-Jun-2024**	25-Nov-2024	✓	**05-Jun-2024**	25-Nov-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)							
Alkalinity by Auto Titrator	ED037-P	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	18	**11.11**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	4	40	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Alkalinity by Auto Titrator	ED037-P	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	18	**11.11**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	40	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Alkalinity by Auto Titrator	ED037-P	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	1	18	**5.56**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	40	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Chloride by Discrete Analyser	ED045G	1	18	**5.56**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	40	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	20	**5.00**	**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
Alkalinity by Auto Titrator	ED037-P	WATER	In house: Referenced to APHA 2320 B This procedure determines alkalinity by automated measurement (e.g. PC Titrate) on a settled supernatant aliquot of the sample using pH 4.5 for indicating the total alkalinity end-point. This method is compliant with NEPM Schedule B(3)
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	WATER	In house: Referenced to APHA 4500-SO4. Dissolved sulfate is determined in a 0.45um filtered sample. Sulfate ions are converted to a barium sulfate suspension in an acetic acid medium with barium chloride. Light absorbance of the BaSO4 suspension is measured by a photometer and the SO4-2 concentration is determined by comparison of the reading with a standard curve. This method is compliant with NEPM Schedule B(3)
Chloride by Discrete Analyser	ED045G	WATER	In house: Referenced to APHA 4500 Cl - G.The thiocyanate ion is liberated from mercuric thiocyanate through sequestration of mercury by the chloride ion to form non-ionised mercuric chloride. In the presence of ferric ions the liberated thiocynate forms highly-coloured ferric thiocynate which is measured at 480 nm.
Major Cations - Dissolved	ED093F	WATER	In house: Referenced to APHA 3120 and 3125; USEPA SW 846 - 6010 and 6020; Cations are determined by either ICP-AES or ICP-MS techniques. This method is compliant with NEPM Schedule B(3) Sodium Adsorption Ratio is calculated from Ca, Mg and Na which determined by ALS in house method QWI-EN/ED093F. This method is compliant with NEPM Schedule B(3) Hardness parameters are calculated based on APHA 2340 B. This method is compliant with NEPM Schedule B(3)
Ionic Balance by PCT DA and Turbi SO4 DA	* EN055 - PG	WATER	In house: Referenced to APHA 1030F. This method is compliant with NEPM Schedule B(3)
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.

ALSCompass
SAMPLING *Intelligence*

Environmental Division
Perth
Work Order Reference
EP2407418

Telephone : +61-8-9406 1301

Custody Document for Submissions via ALS Compass App

Project: WA-0089-PFASDDP-24 Client: STANTEC Project Manager: [redacted]

Phone: [redacted]

ALS Compass COC Reference: 68324 68323 68318 68334 68335 68326 # Samples: 68325 Sampler: [redacted]

Phone: [redacted]

Turnaround Requirements: Standard _____ Urgent _____

Special Instructions:

Custody:

Relinquished by: STANTEC	Received by: [redacted]	Relinquished by:	Received by:
Date / Time: 29/5/24	Date / Time: 30/5 1215	Date / Time:	Date / Time:

CHAIN OF CUSTODY

COC#: 68323 *ALS Laboratory:* EP Perth Environmental

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

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP_24

SITE: Stirling GW - JS

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]erp.labreports@esdat.com.au

EMAIL INVOICES 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	Rinsate WATER	WA OMP Water Suite WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
001	0089_MW123		29/05/2024 08:16 AM	WATER	ALS: 3 Non ALS: 0	No		X		
002	0089_MW121		29/05/2024 08:36 AM	WATER	ALS: 3 Non ALS: 0	No		X		
003	0089_MW120		29/05/2024 08:47 AM	WATER	ALS: 5 Non ALS: 0	No		X		
004	0089_MW112		29/05/2024 09:05 AM	WATER	ALS: 5 Non ALS: 0	No		X		
005	0089_MW109		29/05/2024 09:15 AM	WATER	ALS: 5 Non ALS: 0	No		X		
006	0089_MW500		29/05/2024 09:28 AM	WATER	ALS: 3 Non ALS: 0	No		X		
007	0089_MW127		29/05/2024 09:47 AM	WATER	ALS: 3 Non ALS: 0	No		X		

CHAIN OF CUSTODY

ALS COC#: 68323 ALS Laboratory: EP Perth Environmental

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

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP_24

SITE: Stirling GW - JS

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER:

CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]derp.labreports@esdat.com.au

EMAIL INVOICES 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	Rinsate WATER	WA OMP Water Suite WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
008	0089_MW126		29/05/2024 10:30 AM	WATER	ALS: 3 Non ALS: 0	No		X		
009	0089_MW125		29/05/2024 10:55 AM	WATER	ALS: 3 Non ALS: 0	No		X		
010	0089_MW124		29/05/2024 10:57 AM	WATER	ALS: 3 Non ALS: 0	No		X		
011	0089_MW128		29/05/2024 12:10 PM	WATER	ALS: 5 Non ALS: 0	No		X		
012	0089_QC301		29/05/2024 12:40 PM	WATER	ALS: 2 Non ALS: 0	No	X			
013	0089_QC401		29/05/2024 12:40 PM	WATER	ALS: 2 Non ALS: 0	No	X			
014	0089_QC303		29/05/2024 12:41 PM	WATER	ALS: 2 Non ALS: 0	No	X			

CHAIN OF CUSTODY

COC#: 68323 *ALS Laboratory:* EP Perth Environmental

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

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP_24

SITE: Stirling GW - JS

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted] derp.labreports@esdat.com.au

EMAIL INVOICES 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	Rinsate WATER	WA OMP Water Suite WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
015	0089_QC403		29/05/2024 12:41 PM	WATER	ALS: 2 Non ALS: 0	No	X			

CHAIN OF CUSTODY

ALS COC#: 68323 ALS Laboratory: EP Perth Environmental

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

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP_24

SITE: Stirling GW - JS

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER:

CONTACT PH: [redacted] SAMPLER MOBILE [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted] derp.labreports@esdat.com.au

EMAIL INVOICES 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	0089_MW123	Clear Plastic Bottle - Natural	125 mL	00070821217650	Green	No	
001	0089_MW123	HDPE (no PTFE)	20 mL	00352312048479	Grey	No	
001	0089_MW123	HDPE (no PTFE)	20 mL	00352312048738	Grey	No	
002	0089_MW121	HDPE (no PTFE)	20 mL	00351221005939	Grey	No	
002	0089_MW121	Clear Plastic Bottle - Natural	125 mL	00070522088342	Green	No	
002	0089_MW121	HDPE (no PTFE)	20 mL	00352312011834	Grey	No	
003	0089_MW120	HDPE (no PTFE)	20 mL	00352312011858	Grey	No	
003	0089_MW120	Clear Plastic Bottle - Natural	125 mL	00070522144871	Green	No	
003	0089_MW120	HDPE (no PTFE)	20 mL	00350821001798	Grey	No	
003	0089_MW120	HDPE (no PTFE)	20 mL	00350821001726	Grey	No	
003	0089_MW120	HDPE (no PTFE)	20 mL	00350821036722	Grey	No	
004	0089_MW112	HDPE (no PTFE)	20 mL	00352005002579	Grey	No	
004	0089_MW112	HDPE (no PTFE)	20 mL	00351221020962	Grey	No	
004	0089_MW112	HDPE (no PTFE)	20 mL	00351221020751	Grey	No	
004	0089_MW112	Clear Plastic Bottle - Natural	125 mL	00070522075455	Green	No	
004	0089_MW112	HDPE (no PTFE)	20 mL	00352005019715	Grey	No	
005	0089_MW109	HDPE (no PTFE)	20 mL	00352005019603	Grey	No	
005	0089_MW109	Clear Plastic Bottle - Natural	125 mL	00071121181578	Green	No	
005	0089_MW109	HDPE (no PTFE)	20 mL	00352312003845	Grey	No	
005	0089_MW109	HDPE (no PTFE)	20 mL	00352312004296	Grey	No	
005	0089_MW109	HDPE (no PTFE)	20 mL	00352312048795	Grey	No	
006	0089_MW500	HDPE (no PTFE)	20 mL	00352312048592	Grey	No	
006	0089_MW500	Clear Plastic Bottle - Natural	125 mL	00070821217675	Green	No	
006	0089_MW500	Clear Plastic Bottle - Natural	125 mL	00070821217687	Green	No	
007	0089_MW127	HDPE (no PTFE)	20 mL	00351221024637	Grey	No	
007	0089_MW127						

CHAIN OF CUSTODY

COC#: 68323 *ALS Laboratory:* EP Perth Environmental

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

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP_24

SITE: Stirling GW - JS

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]derp.labreports@esdat.com.au

EMAIL INVOICES 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:

007	0089_MW127	HDPE (no PTFE)	20 mL	00352312048555	Grey	No	
008	0089_MW126	Clear Plastic Bottle - Natural	125 mL	00070821217668	Green	No	
008	0089_MW126	HDPE (no PTFE)	20 mL	00352312048530	Grey	No	
008	0089_MW126	HDPE (no PTFE)	20 mL	00352312048492	Grey	No	
009	0089_MW125	Clear Plastic Bottle - Natural	125 mL	00070821217633	Green	No	
009	0089_MW125	HDPE (no PTFE)	20 mL	00352312048505	Grey	No	
009	0089_MW125	HDPE (no PTFE)	20 mL	00352312048702	Grey	No	
010	0089_MW124	Clear Plastic Bottle - Natural	125 mL	00070821217717	Green	No	
010	0089_MW124	HDPE (no PTFE)	20 mL	00352312048676	Grey	No	
010	0089_MW124	HDPE (no PTFE)	20 mL	00352312048650	Grey	No	
011	0089_MW128	HDPE (no PTFE)	20 mL	00350821036720	Grey	No	
011	0089_MW128	Clear Plastic Bottle - Natural	125 mL	00352005019710	Grey	No	
011	0089_MW128	HDPE (no PTFE)	20 mL	00070821217641	Green	No	
011	0089_MW128	HDPE (no PTFE)	20 mL	00351221024835	Grey	No	
011	0089_MW128	HDPE (no PTFE)	125 mL	00352312048649	Grey	No	
012	0089_QC301	HDPE (no PTFE)	125 mL	00352208098824	Grey	No	
012	0089_QC301	HDPE (no PTFE)	125 mL	00352208098683	Grey	No	
013	0089_QC401	HDPE (no PTFE)	125 mL	00352208098705	Grey	No	
013	0089_QC401	HDPE (no PTFE)	125 mL	00352208098644	Grey	No	
014	0089_QC303	HDPE (no PTFE)	125 mL	00352208098849	Grey	No	
014	0089_QC303	HDPE (no PTFE)	125 mL	00352208098735	Grey	No	
015	0089_QC403	HDPE (no PTFE)	125 mL	00352208098676	Grey	No	
015	0089_QC403	HDPE (no PTFE)	125 mL	00352208098701	Grey	No	

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

SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : **EP2407418**

Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: [redacted]
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
E-mail	: [redacted]stantec.com	E-mail	: [redacted]alsglobal.com
Telephone	: ----	Telephone	: +61-8-9406 1301
Facsimile	: ----	Facsimile	: +61-8-9406 1399
Project	: WA_0089_PFASOMP_24	Page	: 1 of 2
Order number	: pfas-omp/Stirling	Quote number	: ES2022MWHAUS0002 (SY/139/19 B)
C-O-C number	: 68323	QC Level	: NEPM 2013 B3 & ALS QC Standard
Site	: Stirling GW - JS		
Sampler	: [redacted]		

Dates

Date Samples Received	: 30-May-2024 12:15	Issue Date	: 31-May-2024
Client Requested Due Date	: 11-Jun-2024	Scheduled Reporting Date	: **11-Jun-2024**

Delivery Details

Mode of Delivery	: Carrier	Security Seal	: Not Available
No. of coolers/boxes	: 2	Temperature	: 16.7 - Ice present
Receipt Detail	:	No. of samples received / analysed	: 15 / 15

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 see scanned COC for sample discrepencies: extra samples , samples not received etc.
- Please direct any queries related to sample condition / numbering / breakages to Sample Receipt (Samples.Perth@alsglobal.com)
- Analytical work for this work order will be conducted at ALS Environmental Perth.
- Please direct any turnaround / technical queries to the laboratory contact designated above.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months) from receipt of samples.
- **pH analysis should be conducted within 6 hours of sampling.**
- **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.**
- 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 (30 analytes)	WATER - NT-01 & 02 Ca, Mg, Na, K, Cl, SO4, Alkalinity
EP2407418-001	29-May-2024 08:16	0089_MW123_240529	✓	✓
EP2407418-002	29-May-2024 08:36	0089_MW121_240529	✓	✓
EP2407418-003	29-May-2024 08:47	0089_MW120_240529	✓	✓
EP2407418-004	29-May-2024 09:05	0089_MW112_240529	✓	✓
EP2407418-005	29-May-2024 09:15	0089_MW109_240529	✓	✓
EP2407418-006	29-May-2024 09:28	0089_MW500_240529	✓	✓
EP2407418-007	29-May-2024 09:47	0089_MW127_240529	✓	✓
EP2407418-008	29-May-2024 10:30	0089_MW126_240529	✓	✓
EP2407418-009	29-May-2024 10:55	0089_MW125_240529	✓	✓
EP2407418-010	29-May-2024 10:57	0089_MW124_240529	✓	✓
EP2407418-011	29-May-2024 12:10	0089_MW128_240529	✓	✓
EP2407418-012	29-May-2024 12:40	0089_QC301_240529	✓	
EP2407418-013	29-May-2024 12:40	0089_QC401_240529	✓	
EP2407418-014	29-May-2024 12:41	0089_QC303_240529	✓	
EP2407418-015	29-May-2024 12:41	0089_QC403_240529	✓	

Proactive Holding Time Report

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

Requested Deliverables

[redacted]
- A4 - AU Tax Invoice (INV) — Email — [redacted]cardno.com.au

DERP LAB REPORTS
- EDI Format - ESDAT (ESDAT) — Email — derp.labreports@esdat.com.au

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

CERTIFICATE OF ANALYSIS

Work Order	: **EP2407418**	Page	: 1 of 14
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: [redacted]
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: +61-8-9406 1301
Project	: WA_0089_PFASOMP_24	Date Samples Received	: 30-May-2024 12:15
Order number	: pfas-omp/Stirling	Date Analysis Commenced	: 31-May-2024
C-O-C number	: 68323	Issue Date	: 12-Jun-2024 15:35
Sampler	: [redacted] [redacted]		
Site	: Stirling GW - JS		
Quote number	: SY/139/19 B		
No. of samples received	: 15		
No. of samples analysed	: 15		

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]	Inorganics Supervisor	Perth Inorganics, Wangara, WA
[redacted]	Laboratory Manager (Perth)	Perth Inorganics, Wangara, WA
[redacted]	Senior Organic Chemist	Perth Organics, Wangara, WA

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.
- As per QWI – EN55-3 Data Interpreting Procedures, Ionic balances are typically calculated using Major Anions - Chloride, Alkalinity and Sulfate; and Major Cations - Calcium, Magnesium, Potassium and Sodium. Where applicable and dependent upon sample matrix, the Ionic Balance may also include the additional contribution of Ammonia, Dissolved Metals by ICPMS and H+ to the Cations and Nitrate, SiO2 and Fluoride to the Anions.
- ED037-P (Alkalinity) Sample EP2407418-11 was filtered prior to analysis due to possible sample matrix interference. The sample was observed to contain fine particulate that may consume additional titrant.
- Sodium Adsorption Ratio (where reported): Where results for Na, Ca or Mg are <LOR, a concentration at half the reported LOR is incorporated into the SAR calculation. This represents a conservative approach for Na relative to the assumption that <LOR = zero concentration and a conservative approach for Ca & Mg relative to the assumption that <LOR is equivalent to the LOR concentration.
- 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.
- ED045G: The presence of Thiocyanate, Thiosulfate and Sulfite can positively contribute to the chloride result, thereby may bias results higher than expected. Results should be scrutinised accordingly.

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW123_240529	0089_MW121_240529	0089_MW120_240529	0089_MW112_240529	0089_MW109_240529
				Sampling date / time	29-May-2024 08:16	29-May-2024 08:36	29-May-2024 08:47	29-May-2024 09:05	29-May-2024 09:15
Compound	CAS Number	LOR	Unit		EP2407418-001	EP2407418-002	EP2407418-003	EP2407418-004	EP2407418-005
					Result	Result	Result	Result	Result
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	<1	<1	<1	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	<1	<1	<1	<1
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		282	212	256	228	533
Total Alkalinity as CaCO3	----	1	mg/L		282	212	256	228	533
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		20	19	18	38	45
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		53	63	47	42	273
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		95	81	77	91	124
Magnesium	7439-95-4	1	mg/L		16	12	17	13	57
Sodium	7440-23-5	1	mg/L		32	39	30	26	165
Potassium	7440-09-7	1	mg/L		5	3	3	2	<1
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		7.54	6.41	6.82	6.53	19.3
ø Total Cations	----	0.01	meq/L		7.58	6.80	6.62	6.79	18.0
ø Ionic Balance	----	0.01	%		0.21	2.98	1.43	1.96	3.30
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		0.26	0.05	0.02	0.05	0.13
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		0.75	0.09	0.06	0.19	0.21
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		13.6	1.59	1.46	10.4	0.91
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		1.76	0.18	0.36	3.56	<0.02
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		19.6	19.5	3.24	19.4	0.09
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		0.03	<0.02	<0.02	<0.02	<0.02

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW123_240529	0089_MW121_240529	0089_MW120_240529	0089_MW112_240529	0089_MW109_240529
				Sampling date / time	29-May-2024 08:16	29-May-2024 08:36	29-May-2024 08:47	29-May-2024 09:05	29-May-2024 09:15
Compound	CAS Number	LOR	Unit		EP2407418-001	EP2407418-002	EP2407418-003	EP2407418-004	EP2407418-005
					Result	Result	Result	Result	Result
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		**0.2**	**0.1**	<0.1	<0.1	<0.1
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		**0.45**	**0.19**	**0.02**	**0.18**	<0.02
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		**2.58**	**0.32**	**0.10**	**0.86**	**0.12**
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		**0.29**	**0.15**	<0.02	**0.22**	<0.02
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		**1.14**	**0.17**	**0.09**	**1.77**	**0.01**
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		<0.02	**0.03**	<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		**0.21**	**0.06**	<0.02	**0.22**	<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
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									

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW123_240529	0089_MW121_240529	0089_MW120_240529	0089_MW112_240529	0089_MW109_240529
				Sampling date / time	29-May-2024 08:16	29-May-2024 08:36	29-May-2024 08:47	29-May-2024 09:05	29-May-2024 09:15
Compound	CAS Number	LOR	Unit		EP2407418-001	EP2407418-002	EP2407418-003	EP2407418-004	EP2407418-005
					Result	Result	Result	Result	Result
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
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		**0.22**	**0.12**	<0.05	**0.09**	<0.05
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		**0.06**	<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		**41.5**	**22.7**	**5.35**	**37.0**	**1.47**
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		**33.2**	**21.1**	**4.70**	**29.8**	**1.00**
Sum of PFAS (WA DER List)	----	0.01	µg/L		**38.4**	**22.2**	**4.93**	**33.0**	**1.26**
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**101**	**97.0**	**101**	**93.7**	**109**
13C8-PFOA	----	0.02	%		**109**	**104**	**102**	**104**	**96.3**

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW500_240529	0089_MW127_240529	0089_MW126_240529	0089_MW125_240529	0089_MW124_240529
				Sampling date / time	29-May-2024 09:28	29-May-2024 09:47	29-May-2024 10:30	29-May-2024 10:55	29-May-2024 10:57
Compound	CAS Number	LOR	Unit		EP2407418-006	EP2407418-007	EP2407418-008	EP2407418-009	EP2407418-010
					Result	Result	Result	Result	Result
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	<1	<1	<1	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	<1	<1	<1	<1
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		527	616	599	412	433
Total Alkalinity as CaCO3	----	1	mg/L		527	616	599	412	433
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		31	1610	1630	2060	1980
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		60	15400	15500	17800	16900
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		153	380	405	472	464
Magnesium	7439-95-4	1	mg/L		18	1070	1070	1200	1120
Sodium	7440-23-5	1	mg/L		41	6950	7080	8470	7900
Potassium	7440-09-7	1	mg/L		4	362	372	461	419
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		12.9	480	483	553	527
ø Total Cations	----	0.01	meq/L		11.0	418	426	502	470
ø Ionic Balance	----	0.01	%		7.82	6.86	6.31	4.80	5.71
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		0.15	<0.02	<0.02	0.15	0.02
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		0.39	<0.02	<0.02	0.14	<0.02
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		7.30	<0.01	<0.01	0.56	<0.01
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		1.57	<0.02	<0.02	<0.02	<0.02
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		56.0	<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

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW500_240529	0089_MW127_240529	0089_MW126_240529	0089_MW125_240529	0089_MW124_240529
				Sampling date / time	29-May-2024 09:28	29-May-2024 09:47	29-May-2024 10:30	29-May-2024 10:55	29-May-2024 10:57
Compound	CAS Number	LOR	Unit		EP2407418-006	EP2407418-007	EP2407418-008	EP2407418-009	EP2407418-010
					Result	Result	Result	Result	Result
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		**0.17**	<0.02	<0.02	**0.02**	<0.02
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		**1.12**	<0.02	<0.02	**0.17**	<0.02
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		**0.16**	<0.02	<0.02	<0.02	<0.02
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		**0.54**	<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
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									

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW500_240529	0089_MW127_240529	0089_MW126_240529	0089_MW125_240529	0089_MW124_240529
				Sampling date / time	29-May-2024 09:28	29-May-2024 09:47	29-May-2024 10:30	29-May-2024 10:55	29-May-2024 10:57
Compound	CAS Number	LOR	Unit		EP2407418-006	EP2407418-007	EP2407418-008	EP2407418-009	EP2407418-010
					Result	Result	Result	Result	Result
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
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		**67.7**	<0.01	<0.01	**1.04**	**0.02**
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		**63.3**	<0.01	<0.01	**0.56**	<0.01
Sum of PFAS (WA DER List)	----	0.01	µg/L		**65.5**	<0.01	<0.01	**0.90**	**0.02**
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**70.7**	**110**	**104**	**106**	**107**
13C8-PFOA	----	0.02	%		**88.6**	**92.1**	**89.2**	**94.0**	**95.0**

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW128_240529	----	----	----	----
				Sampling date / time	29-May-2024 12:10	----	----	----	----
Compound	CAS Number	LOR	Unit		EP2407418-011	--------	--------	--------	--------
					Result	----	----	----	----
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	----	----	----	----
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	----	----	----	----
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		**237**	----	----	----	----
Total Alkalinity as CaCO3	----	1	mg/L		**237**	----	----	----	----
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		**31**	----	----	----	----
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		**56**	----	----	----	----
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		**78**	----	----	----	----
Magnesium	7439-95-4	1	mg/L		**13**	----	----	----	----
Sodium	7440-23-5	1	mg/L		**36**	----	----	----	----
Potassium	7440-09-7	1	mg/L		**2**	----	----	----	----
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		**6.96**	----	----	----	----
ø Total Cations	----	0.01	meq/L		**6.58**	----	----	----	----
ø Ionic Balance	----	0.01	%		**2.82**	----	----	----	----
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		**0.03**	----	----	----	----
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		<0.02	----	----	----	----
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		**0.64**	----	----	----	----
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	----	----	----	----

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW128_240529	----	----	----	----
				Sampling date / time	29-May-2024 12:10	----	----	----	----
Compound	CAS Number	LOR	Unit		EP2407418-011	--------	--------	--------	--------
					Result	----	----	----	----
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	----	----	----	----
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									

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW128_240529	----	----	----	----
				Sampling date / time	29-May-2024 12:10	----	----	----	----
Compound	CAS Number	LOR	Unit		EP2407418-011	--------	--------	--------	--------
					Result	----	----	----	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
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		**0.67**	----	----	----	----
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		**0.67**	----	----	----	----
Sum of PFAS (WA DER List)	----	0.01	µg/L		**0.67**	----	----	----	----
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**102**	----	----	----	----
13C8-PFOA	----	0.02	%		**89.8**	----	----	----	----

Analytical Results

Sub-Matrix: RINSATE (Matrix: WATER)				Sample ID	0089_QC301_240529	0089_QC401_240529	0089_QC303_240529	0089_QC403_240529	----
				Sampling date / time	29-May-2024 12:40	29-May-2024 12:40	29-May-2024 12:41	29-May-2024 12:41	----
Compound	CAS Number	LOR	Unit		EP2407418-012	EP2407418-013	EP2407418-014	EP2407418-015	--------
					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		<0.01	<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	----
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		<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	----
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		<0.02	<0.02	<0.02	<0.02	----
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
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	----

Analytical Results

Sub-Matrix: RINSATE (Matrix: WATER)				Sample ID	0089_QC301_240529	0089_QC401_240529	0089_QC303_240529	0089_QC403_240529	----
				Sampling date / time	29-May-2024 12:40	29-May-2024 12:40	29-May-2024 12:41	29-May-2024 12:41	----
Compound	CAS Number	LOR	Unit		EP2407418-012	EP2407418-013	EP2407418-014	EP2407418-015	--------
					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	----
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		<0.01	<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	----
Sum of PFAS (WA DER List)	----	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	----
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**112**	**104**	**99.9**	**97.9**	----
13C8-PFOA	----	0.02	%		**88.4**	**85.7**	**88.9**	**81.5**	----

Surrogate Control Limits

Sub-Matrix: GROUNDWATER		Recovery Limits (%)	
Compound	CAS Number	Low	High
EP231S: PFAS Surrogate			
13C4-PFOS	----	65	140
13C8-PFOA	----	71	133

Sub-Matrix: RINSATE		Recovery Limits (%)	
Compound	CAS Number	Low	High
EP231S: PFAS Surrogate			
13C4-PFOS	----	65	140
13C8-PFOA	----	71	133

QUALITY CONTROL REPORT

Work Order	: **EP2407418**	Page	: 1 of 20
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: [redacted]
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: +61-8-9406 1301
Project	: WA_0089_PFASOMP_24	Date Samples Received	: 30-May-2024
Order number	: pfas-omp/Stirling	Date Analysis Commenced	: 31-May-2024
C-O-C number	: 68323	Issue Date	: 12-Jun-2024
Sampler	: [redacted] [redacted]		
Site	: Stirling GW - JS		
Quote number	: SY/139/19 B		
No. of samples received	: 15		
No. of samples analysed	: 15		

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]	Inorganics Supervisor	Perth Inorganics, Wangara, WA
[redacted]	Laboratory Manager (Perth)	Perth Inorganics, Wangara, WA
[redacted]	Senior Organic Chemist	Perth Organics, Wangara, WA

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 (%)
ED037P: Alkalinity by PC Titrator (QC Lot: 5837282)									
EP2407411-002	Anonymous	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	706	703	0.3	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	706	703	0.3	0% - 20%
EP2407417-005	Anonymous	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	465	465	0.0	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	465	465	0.0	0% - 20%
ED037P: Alkalinity by PC Titrator (QC Lot: 5837685)									
EP2407418-005	0089_MW109_240529	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	533	536	0.5	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	533	536	0.5	0% - 20%
EP2407420-003	Anonymous	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	124	124	0.0	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	124	124	0.0	0% - 20%
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QC Lot: 5829568)									
EP2407417-001	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	52	52	0.0	0% - 20%
EP2407417-011	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	90	91	0.0	0% - 20%
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QC Lot: 5829570)									
EP2407418-005	0089_MW109_240529	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	45	45	0.0	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 (%)*
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QC Lot: 5829570) - continued									
EP2407420-004	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	1980	1920	3.0	0% - 20%
ED045G: Chloride by Discrete Analyser (QC Lot: 5829569)									
EP2407417-001	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	190	185	2.5	0% - 20%
EP2407417-011	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	42	42	0.0	0% - 20%
ED045G: Chloride by Discrete Analyser (QC Lot: 5829571)									
EP2407418-005	0089_MW109_240529	ED045G: Chloride	16887-00-6	1	mg/L	273	268	2.1	0% - 20%
EP2407420-004	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	16200	16000	1.3	0% - 20%
ED093F: Dissolved Major Cations (QC Lot: 5833495)									
EP2407411-001	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	211	210	0.0	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	533	531	0.5	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	3630	3600	0.7	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	183	183	0.0	0% - 20%
EP2407417-005	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	86	85	1.6	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	43	41	4.1	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	167	168	0.6	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	17	17	0.0	0% - 50%
ED093F: Dissolved Major Cations (QC Lot: 5833496)									
EP2407418-004	0089_MW112_240529	ED093F: Calcium	7440-70-2	1	mg/L	91	91	0.0	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	13	13	0.0	0% - 50%
		ED093F: Sodium	7440-23-5	1	mg/L	26	25	0.0	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	2	2	0.0	No Limit
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 5835276)									
EP2407413-004	Anonymous	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
EP2407413-015	Anonymous	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	0.04	0.02	67.4	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: 5835299)									
EP2407413-009	Anonymous	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	0.02	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 (%)*
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 5835299) - continued									
EP2407413-009	Anonymous	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
EP2407417-006	Anonymous	EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	0.24	0.23	0.0	0% - 20%
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	0.02	0.02	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: 5835304)									
EP2407418-012	0089_QC301_240529	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
EP2407418-014	0089_QC303_240529	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
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 5835276)									
EP2407413-004	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
EP2407413-015	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

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: 5835276) - continued									
EP2407413-015	Anonymous	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: 5835299)									
EP2407413-009	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
EP2407417-006	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
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 5835304)									
EP2407418-012	0089_QC301_240529	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

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: 5835304) - continued									
EP2407418-012	0089_QC301_240529	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
EP2407418-014	0089_QC303_240529	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: 5835276)									
EP2407413-004	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
EP2407413-015	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

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: 5835276) - continued									
EP2407413-015	Anonymous	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: 5835299)									
EP2407413-009	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
EP2407417-006	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
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 5835304)									
EP2407418-012	0089_QC301_240529	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

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: 5835304) - continued									
EP2407418-012	0089_QC301_240529	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
EP2407418-014	0089_QC303_240529	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: 5835276)									
EP2407413-004	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
EP2407413-015	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
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 5835299)									
EP2407413-009	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

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: 5835299) - continued									
EP2407413-009	Anonymous	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
EP2407417-006	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
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 5835304)									
EP2407418-012	0089_QC301_240529	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
EP2407418-014	0089_QC303_240529	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: 5835276)									
EP2407413-004	Anonymous	EP231X: Sum of PFAS	----	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	<0.01	<0.01	0.0	No Limit
EP2407413-015	Anonymous	EP231X: Sum of PFAS	----	0.01	µg/L	0.04	0.02	66.7	No Limit
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	0.04	0.02	66.7	No Limit
		EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	0.04	0.02	66.7	No Limit
EP231P: PFAS Sums (QC Lot: 5835299)									
EP2407413-009	Anonymous	EP231X: Sum of PFAS	----	0.01	µg/L	0.02	0.01	66.7	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 (%)*
EP231P: PFAS Sums (QC Lot: 5835299) - continued									
EP2407413-009	Anonymous	EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	0.02	0.01	66.7	No Limit
		EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	0.02	0.01	66.7	No Limit
EP2407417-006	Anonymous	EP231X: Sum of PFAS	----	0.01	µg/L	0.26	0.25	3.9	0% - 20%
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	0.26	0.25	3.9	0% - 20%
		EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	0.26	0.25	3.9	0% - 20%
EP231P: PFAS Sums (QC Lot: 5835304)									
EP2407418-012	0089_QC301_240529	EP231X: Sum of PFAS	----	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	<0.01	<0.01	0.0	No Limit
EP2407418-014	0089_QC303_240529	EP231X: Sum of PFAS	----	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	<0.01	<0.01	0.0	No Limit

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
ED037P: Alkalinity by PC Titrator (QCLot: 5837282)								
ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	----	----	----	----
ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	----	----	----	----
ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	<1	----	----	----	----
ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	<1	20 mg/L	100	85.1	126
				<1	200 mg/L	100	90.5	111
ED037P: Alkalinity by PC Titrator (QCLot: 5837685)								
ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	----	----	----	----
ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	----	----	----	----
ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	<1	----	----	----	----
ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	<1	20 mg/L	99.6	85.1	126
				<1	200 mg/L	101	90.5	111
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 5829568)								
ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<1	25 mg/L	101	89.9	112
				<1	500 mg/L	90.1	89.9	112
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 5829570)								
ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<1	25 mg/L	99.1	89.9	112
				<1	500 mg/L	93.8	89.9	112
ED045G: Chloride by Discrete Analyser (QCLot: 5829569)								
ED045G: Chloride	16887-00-6	1	mg/L	<1	10 mg/L	97.5	88.6	113
				<1	1000 mg/L	106	88.6	113
ED045G: Chloride by Discrete Analyser (QCLot: 5829571)								
ED045G: Chloride	16887-00-6	1	mg/L	<1	10 mg/L	97.2	88.6	113
				<1	1000 mg/L	106	88.6	113
ED093F: Dissolved Major Cations (QCLot: 5833495)								
ED093F: Calcium	7440-70-2	1	mg/L	<1	50 mg/L	101	86.5	117
ED093F: Magnesium	7439-95-4	1	mg/L	<1	50 mg/L	99.1	88.4	110
ED093F: Sodium	7440-23-5	1	mg/L	<1	50 mg/L	98.2	91.4	113
ED093F: Potassium	7440-09-7	1	mg/L	<1	50 mg/L	95.1	84.6	108
ED093F: Dissolved Major Cations (QCLot: 5833496)								

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
ED093F: Dissolved Major Cations (QCLot: 5833496) - continued								
ED093F: Calcium	7440-70-2	1	mg/L	<1	50 mg/L	100	86.5	117
ED093F: Magnesium	7439-95-4	1	mg/L	<1	50 mg/L	98.5	88.4	110
ED093F: Sodium	7440-23-5	1	mg/L	<1	50 mg/L	97.8	91.4	113
ED093F: Potassium	7440-09-7	1	mg/L	<1	50 mg/L	94.7	84.6	108
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5835276)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.2218 µg/L	96.0	72.0	130
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.2352 µg/L	108	71.0	127
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	0.2373 µg/L	97.3	68.0	131
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.238 µg/L	101	69.0	134
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.232 µg/L	97.8	65.0	140
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.241 µg/L	91.7	53.0	142
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5835284)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.2218 µg/L	95.1	72.0	130
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.2352 µg/L	100	71.0	127
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	0.2373 µg/L	95.9	68.0	131
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.238 µg/L	107	69.0	134
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.232 µg/L	95.0	65.0	140
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.241 µg/L	92.9	53.0	142
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5835299)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.2218 µg/L	89.5	72.0	130
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.2352 µg/L	91.2	71.0	127
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	0.2373 µg/L	93.3	68.0	131
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.238 µg/L	102	69.0	134
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.232 µg/L	78.4	65.0	140
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.241 µg/L	79.5	53.0	142
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5835304)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.2218 µg/L	92.6	72.0	130
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.2352 µg/L	98.8	71.0	127
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	0.2373 µg/L	94.6	68.0	131
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.238 µg/L	97.3	69.0	134
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.232 µg/L	85.1	65.0	140
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.241 µg/L	93.8	53.0	142
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5835276)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	1.25 µg/L	103	73.0	129

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: 5835276) - continued								
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	99.2	72.0	129
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	0.25 µg/L	103	72.0	130
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	0.25 µg/L	97.4	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	97.8	71.0	129
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	0.25 µg/L	103	69.0	133
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	0.25 µg/L	101	72.0	134
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	0.25 µg/L	110	65.0	144
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	0.25 µg/L	106	71.0	132
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5835284)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	1.25 µg/L	112	73.0	129
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	0.25 µg/L	81.8	72.0	129
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	0.25 µg/L	116	72.0	129
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	0.25 µg/L	103	72.0	130
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	0.25 µg/L	104	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	89.8	71.0	129
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	0.25 µg/L	87.6	69.0	133
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	0.25 µg/L	98.8	72.0	134
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	0.25 µg/L	90.6	65.0	144
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	0.25 µg/L	106	71.0	132
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5835299)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	1.25 µg/L	93.6	73.0	129
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	0.25 µg/L	97.8	72.0	129
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	0.25 µg/L	99.6	72.0	129
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	0.25 µg/L	88.2	72.0	130
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	0.25 µg/L	94.8	71.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	0.25 µg/L	85.4	69.0	130
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	0.25 µg/L	88.8	71.0	129
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	0.25 µg/L	111	69.0	133
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	0.25 µg/L	88.0	72.0	134
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	0.25 µg/L	95.8	65.0	144
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	0.25 µg/L	98.4	71.0	132

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: 5835304)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	1.25 µg/L	105	73.0	129
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	0.25 µg/L	84.6	72.0	129
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	0.25 µg/L	112	72.0	129
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	0.25 µg/L	102	72.0	130
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	0.25 µg/L	109	71.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	0.25 µg/L	92.2	69.0	130
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	0.25 µg/L	94.8	71.0	129
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	0.25 µg/L	82.0	69.0	133
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	0.25 µg/L	101	72.0	134
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	0.25 µg/L	136	65.0	144
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	0.25 µg/L	102	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5835276)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.25 µg/L	105	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	0.625 µg/L	108	68.0	141
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	0.625 µg/L	98.4	60.5	138
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	0.625 µg/L	104	68.3	134
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	0.625 µg/L	112	62.2	138
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	0.25 µg/L	102	65.0	136
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	0.25 µg/L	104	61.0	135
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5835284)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.25 µg/L	90.6	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	0.625 µg/L	111	68.0	141
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	0.625 µg/L	69.8	60.5	138
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	0.625 µg/L	109	68.3	134
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	0.625 µg/L	105	62.2	138
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	0.25 µg/L	106	65.0	136
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	0.25 µg/L	123	61.0	135
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5835299)								

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
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5835299) - continued								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.25 µg/L	86.2	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	0.625 µg/L	108	68.0	141
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	0.625 µg/L	99.4	60.5	138
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	0.625 µg/L	96.7	68.3	134
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	0.625 µg/L	101	62.2	138
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	0.25 µg/L	96.8	65.0	136
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	0.25 µg/L	80.4	61.0	135
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5835304)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.25 µg/L	92.6	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	0.625 µg/L	108	68.0	141
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	0.625 µg/L	94.3	60.5	138
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	0.625 µg/L	104	68.3	134
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	0.625 µg/L	106	62.2	138
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	0.25 µg/L	88.2	65.0	136
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	0.25 µg/L	97.6	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5835276)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.2343 µg/L	108	63.0	143
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	0.2378 µg/L	109	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	0.24 µg/L	110	67.0	138
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	0.241 µg/L	113	64.2	133
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5835284)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.2343 µg/L	109	63.0	143
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	0.2378 µg/L	106	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	0.24 µg/L	99.4	67.0	138
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	0.241 µg/L	94.0	64.2	133
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5835299)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.2343 µg/L	93.7	63.0	143
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	0.2378 µg/L	84.7	64.0	140

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: 5835299) - continued								
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	0.24 µg/L	88.8	67.0	138
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	0.241 µg/L	86.3	64.2	133
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5835304)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.2343 µg/L	103	63.0	143
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	0.2378 µg/L	108	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	0.24 µg/L	102	67.0	138
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	0.241 µg/L	88.4	64.2	133
EP231P: PFAS Sums (QCLot: 5835276)								
EP231X: Sum of PFAS	----	0.01	µg/L	<0.01	----	----	----	----
EP231X: Sum of PFHxS and PFOS	355-46-4/17 63-23-1	0.01	µg/L	<0.01	----	----	----	----
EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	<0.01	----	----	----	----
EP231P: PFAS Sums (QCLot: 5835284)								
EP231X: Sum of PFAS	----	0.01	µg/L	<0.01	----	----	----	----
EP231X: Sum of PFHxS and PFOS	355-46-4/17 63-23-1	0.01	µg/L	<0.01	----	----	----	----
EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	<0.01	----	----	----	----
EP231P: PFAS Sums (QCLot: 5835299)								
EP231X: Sum of PFAS	----	0.01	µg/L	<0.01	----	----	----	----
EP231X: Sum of PFHxS and PFOS	355-46-4/17 63-23-1	0.01	µg/L	<0.01	----	----	----	----
EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	<0.01	----	----	----	----
EP231P: PFAS Sums (QCLot: 5835304)								
EP231X: Sum of PFAS	----	0.01	µg/L	<0.01	----	----	----	----
EP231X: Sum of PFHxS and PFOS	355-46-4/17 63-23-1	0.01	µg/L	<0.01	----	----	----	----
EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	<0.01	----	----	----	----

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
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 5829568)							

Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 5829568) - continued							
EP2407417-001	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	100 mg/L	117	70.4	130
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 5829570)							
EP2407418-005	0089_MW109_240529	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	100 mg/L	107	70.4	130
ED045G: Chloride by Discrete Analyser (QCLot: 5829569)							
EP2407417-001	Anonymous	ED045G: Chloride	16887-00-6	200 mg/L	107	70.0	130
ED045G: Chloride by Discrete Analyser (QCLot: 5829571)							
EP2407418-005	0089_MW109_240529	ED045G: Chloride	16887-00-6	200 mg/L	110	70.0	130
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5835276)							
EP2407413-014	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.2218 µg/L	93.7	72.0	129
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.232 µg/L	98.9	71.0	127
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.2352 µg/L	89.6	68.0	129
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.238 µg/L	101	69.0	134
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.232 µg/L	90.4	65.0	140
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.241 µg/L	85.7	53.0	129
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5835299)							
EP2407417-003	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.2218 µg/L	81.5	72.0	129
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.232 µg/L	90.5	71.0	127
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.2352 µg/L	83.6	68.0	129
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.238 µg/L	104	69.0	134
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.232 µg/L	73.6	65.0	140
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.241 µg/L	92.3	53.0	129
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5835304)							
EP2407418-013	0089_QC401_240529	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.2218 µg/L	98.3	72.0	129
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.232 µg/L	108	71.0	127
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.2352 µg/L	102	68.0	129
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.238 µg/L	106	69.0	134
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.232 µg/L	91.4	65.0	140
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.241 µg/L	82.1	53.0	129
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5835276)							
EP2407413-014	Anonymous	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	1.25 µg/L	101	73.0	142
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.25 µg/L	100	72.0	129
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.25 µg/L	105	72.0	129
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.25 µg/L	102	72.0	130
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.25 µg/L	100	71.0	133
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.25 µg/L	99.2	69.0	130
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.25 µg/L	98.4	71.0	134
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.25 µg/L	102	69.0	133

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: 5835276) - continued							
EP2407413-014	Anonymous	EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.25 µg/L	106	72.0	134
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.25 µg/L	121	65.0	144
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.25 µg/L	100	71.0	132
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5835299)							
EP2407417-003	Anonymous	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	1.25 µg/L	92.4	73.0	142
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.25 µg/L	100.0	72.0	129
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.25 µg/L	105	72.0	129
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.25 µg/L	88.1	72.0	130
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.25 µg/L	92.7	71.0	133
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.25 µg/L	102	69.0	130
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.25 µg/L	93.0	71.0	134
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.25 µg/L	103	69.0	133
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.25 µg/L	93.6	72.0	134
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.25 µg/L	96.8	65.0	144
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.25 µg/L	93.1	71.0	132
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5835304)							
EP2407418-013	0089_QC401_240529	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	1.25 µg/L	111	73.0	142
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.25 µg/L	78.6	72.0	129
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.25 µg/L	115	72.0	129
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.25 µg/L	106	72.0	130
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.25 µg/L	111	71.0	133
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.25 µg/L	96.8	69.0	130
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.25 µg/L	102	71.0	134
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.25 µg/L	98.4	69.0	133
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.25 µg/L	104	72.0	134
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.25 µg/L	115	65.0	144
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.25 µg/L	105	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5835276)							
EP2407413-014	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.25 µg/L	101	59.0	135
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.625 µg/L	110	70.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.625 µg/L	105	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.625 µg/L	109	70.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.625 µg/L	106	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.25 µg/L	90.0	65.0	136

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: 5835276) - continued							
EP2407413-014	Anonymous	EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.25 µg/L	93.9	61.0	135
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5835299)							
EP2407417-003	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.25 µg/L	84.0	59.0	135
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.625 µg/L	98.8	70.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.625 µg/L	114	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.625 µg/L	99.7	70.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.625 µg/L	100	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.25 µg/L	89.8	65.0	136
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.25 µg/L	96.6	61.0	135
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5835304)							
EP2407418-013	0089_QC401_240529	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.25 µg/L	92.6	59.0	135
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.625 µg/L	90.7	70.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.625 µg/L	74.2	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.625 µg/L	114	70.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.625 µg/L	109	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.25 µg/L	99.8	65.0	136
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.25 µg/L	129	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5835276)							
EP2407413-014	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.234 µg/L	98.9	63.0	143
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.2378 µg/L	114	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.24 µg/L	98.8	67.0	138
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.2415 µg/L	92.6	70.0	130
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5835299)							
EP2407417-003	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.234 µg/L	96.6	63.0	143
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.2378 µg/L	101	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.24 µg/L	93.6	67.0	138
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.2415 µg/L	89.7	70.0	130

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: 5835304)							
EP2407418-013	0089_QC401_240529	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.234 µg/L	110	63.0	143
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.2378 µg/L	114	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.24 µg/L	114	67.0	138
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.2415 µg/L	83.0	70.0	130

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **EP2407418**	Page	: 1 of 6
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Telephone	: +61-8-9406 1301
Project	: WA_0089_PFASOMP_24	Date Samples Received	: 30-May-2024
Site	: Stirling GW - JS	Issue Date	: 12-Jun-2024
Sampler	: [redacted]	No. of samples received	: 15
Order number	: pfas-omp/Stirling	No. of samples analysed	: 15

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, where applicable to the methodology, 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	6	67	8.96	10.00	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)						
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	3	67	4.48	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			Analysis		
			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
ED037P: Alkalinity by PC Titrator								
Clear Plastic Bottle - Natural (ED037-P)								
0089_MW123_240529,	0089_MW121_240529,	**29-May-2024**	**----**	----	----	**05-Jun-2024**	12-Jun-2024	✓
0089_MW120_240529,	0089_MW112_240529,							
0089_MW109_240529,	0089_MW500_240529,							
0089_MW127_240529,	0089_MW126_240529,							
0089_MW125_240529,	0089_MW124_240529,							
0089_MW128_240529								
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA								
Clear Plastic Bottle - Natural (ED041G)								
0089_MW123_240529,	0089_MW121_240529,	**29-May-2024**	**----**	----	----	**11-Jun-2024**	26-Jun-2024	✓
0089_MW120_240529,	0089_MW112_240529,							
0089_MW109_240529,	0089_MW500_240529,							
0089_MW127_240529,	0089_MW126_240529,							
0089_MW125_240529,	0089_MW124_240529,							
0089_MW128_240529								
ED045G: Chloride by Discrete Analyser								
Clear Plastic Bottle - Natural (ED045G)								
0089_MW123_240529,	0089_MW121_240529,	**29-May-2024**	**----**	----	----	**11-Jun-2024**	26-Jun-2024	✓
0089_MW120_240529,	0089_MW112_240529,							
0089_MW109_240529,	0089_MW500_240529,							
0089_MW127_240529,	0089_MW126_240529,							
0089_MW125_240529,	0089_MW124_240529,							
0089_MW128_240529								

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
ED093F: Dissolved Major Cations							
Clear Plastic Bottle - Natural (ED093F)							
0089_MW123_240529, 0089_MW121_240529, 0089_MW120_240529, 0089_MW112_240529, 0089_MW109_240529, 0089_MW500_240529, 0089_MW127_240529, 0089_MW126_240529, 0089_MW125_240529, 0089_MW124_240529, 0089_MW128_240529	**29-May-2024**	**----**	----	**----**	**04-Jun-2024**	05-Jun-2024	✓
EP231A: Perfluoroalkyl Sulfonic Acids							
HDPE (no PTFE) (EP231X)							
0089_MW123_240529, 0089_MW121_240529, 0089_MW120_240529, 0089_MW112_240529, 0089_MW109_240529, 0089_MW127_240529, 0089_MW126_240529, 0089_MW125_240529, 0089_MW124_240529	**29-May-2024**	**05-Jun-2024**	25-Nov-2024	✓	**05-Jun-2024**	25-Nov-2024	✓
HDPE (no PTFE) (EP231X)							
0089_MW500_240529, 0089_MW128_240529, 0089_QC301_240529, 0089_QC401_240529, 0089_QC303_240529, 0089_QC403_240529	**29-May-2024**	**07-Jun-2024**	25-Nov-2024	✓	**07-Jun-2024**	25-Nov-2024	✓
EP231B: Perfluoroalkyl Carboxylic Acids							
HDPE (no PTFE) (EP231X)							
0089_MW123_240529, 0089_MW121_240529, 0089_MW120_240529, 0089_MW112_240529, 0089_MW109_240529, 0089_MW127_240529, 0089_MW126_240529, 0089_MW125_240529, 0089_MW124_240529	**29-May-2024**	**05-Jun-2024**	25-Nov-2024	✓	**05-Jun-2024**	25-Nov-2024	✓
HDPE (no PTFE) (EP231X)							
0089_MW500_240529, 0089_MW128_240529, 0089_QC301_240529, 0089_QC401_240529, 0089_QC303_240529, 0089_QC403_240529	**29-May-2024**	**07-Jun-2024**	25-Nov-2024	✓	**07-Jun-2024**	25-Nov-2024	✓
EP231C: Perfluoroalkyl Sulfonamides							
HDPE (no PTFE) (EP231X)							
0089_MW123_240529, 0089_MW121_240529, 0089_MW120_240529, 0089_MW112_240529, 0089_MW109_240529, 0089_MW127_240529, 0089_MW126_240529, 0089_MW125_240529, 0089_MW124_240529	**29-May-2024**	**05-Jun-2024**	25-Nov-2024	✓	**05-Jun-2024**	25-Nov-2024	✓
HDPE (no PTFE) (EP231X)							
0089_MW500_240529, 0089_MW128_240529, 0089_QC301_240529, 0089_QC401_240529, 0089_QC303_240529, 0089_QC403_240529	**29-May-2024**	**07-Jun-2024**	25-Nov-2024	✓	**07-Jun-2024**	25-Nov-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) 0089_MW123_240529, 0089_MW121_240529, 0089_MW120_240529, 0089_MW112_240529, 0089_MW109_240529, 0089_MW127_240529, 0089_MW126_240529, 0089_MW125_240529, 0089_MW124_240529	**29-May-2024**	**05-Jun-2024**	25-Nov-2024	✓	**05-Jun-2024**	25-Nov-2024	✓
HDPE (no PTFE) (EP231X) 0089_MW500_240529, 0089_MW128_240529, 0089_QC301_240529, 0089_QC401_240529, 0089_QC303_240529, 0089_QC403_240529	**29-May-2024**	**07-Jun-2024**	25-Nov-2024	✓	**07-Jun-2024**	25-Nov-2024	✓
EP231P: PFAS Sums							
HDPE (no PTFE) (EP231X) 0089_MW123_240529, 0089_MW121_240529, 0089_MW120_240529, 0089_MW112_240529, 0089_MW109_240529, 0089_MW127_240529, 0089_MW126_240529, 0089_MW125_240529, 0089_MW124_240529	**29-May-2024**	**05-Jun-2024**	25-Nov-2024	✓	**05-Jun-2024**	25-Nov-2024	✓
HDPE (no PTFE) (EP231X) 0089_MW500_240529, 0089_MW128_240529, 0089_QC301_240529, 0089_QC401_240529, 0089_QC303_240529, 0089_QC403_240529	**29-May-2024**	**07-Jun-2024**	25-Nov-2024	✓	**07-Jun-2024**	25-Nov-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)							
Alkalinity by Auto Titrator	ED037-P	4	40	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	4	38	**10.53**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	3	28	**10.71**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	6	67	**8.96**	**10.00**	×	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	4	40	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Alkalinity by Auto Titrator	ED037-P	4	40	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	4	38	**10.53**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	2	28	**7.14**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	4	67	**5.97**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	4	40	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Alkalinity by Auto Titrator	ED037-P	2	40	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	38	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	2	28	**7.14**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	4	67	**5.97**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	40	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Chloride by Discrete Analyser	ED045G	2	38	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	3	67	**4.48**	**5.00**	×	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	40	**5.00**	**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
Alkalinity by Auto Titrator	ED037-P	WATER	In house: Referenced to APHA 2320 B This procedure determines alkalinity by automated measurement (e.g. PC Titrate) on a settled supernatant aliquot of the sample using pH 4.5 for indicating the total alkalinity end-point. This method is compliant with NEPM Schedule B(3)
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	WATER	In house: Referenced to APHA 4500-SO4. Dissolved sulfate is determined in a 0.45um filtered sample. Sulfate ions are converted to a barium sulfate suspension in an acetic acid medium with barium chloride. Light absorbance of the BaSO4 suspension is measured by a photometer and the SO4-2 concentration is determined by comparison of the reading with a standard curve. This method is compliant with NEPM Schedule B(3)
Chloride by Discrete Analyser	ED045G	WATER	In house: Referenced to APHA 4500 Cl - G.The thiocyanate ion is liberated from mercuric thiocyanate through sequestration of mercury by the chloride ion to form non-ionised mercuric chloride. In the presence of ferric ions the liberated thiocynate forms highly-coloured ferric thiocynate which is measured at 480 nm.
Major Cations - Dissolved	ED093F	WATER	In house: Referenced to APHA 3120 and 3125; USEPA SW 846 - 6010 and 6020; Cations are determined by either ICP-AES or ICP-MS techniques. This method is compliant with NEPM Schedule B(3) Sodium Adsorption Ratio is calculated from Ca, Mg and Na which determined by ALS in house method QWI-EN/ED093F. This method is compliant with NEPM Schedule B(3) Hardness parameters are calculated based on APHA 2340 B. This method is compliant with NEPM Schedule B(3)
Ionic Balance by PCT DA and Turbi SO4 DA	* EN055 - PG	WATER	In house: Referenced to APHA 1030F. This method is compliant with NEPM Schedule B(3)
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.

ALSCompass
SAMPLING Intelligence

ALS

Environmental Division
Perth
Work Order Reference
EP2407420

Telephone : +61-8-9406 1301

Custody Document for Submissions via ALS Compass App

Project: WA-0089-PPASONP-24 Client: STANTEC Project Manager [redacted]

Phone: ( )

ALS Compass COC Reference: 68323 68318 68334 68335 68326 68324 # Samples: 68325 Sampler:

Phone: ( )

Turnaround Requirements: Standard ✓ Urgent

Special Instructions:

Custody:

Relinquished by: STANTEC	Received by: [redacted]	Relinquished by:	Received by:
Date / Time: 29/5/24	Date / Time: 30/5 1215	Date / Time:	Date / Time:

CHAIN OF CUSTODY

COC#: **68325** *ALS Laboratory:* EP Perth Environmental

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

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP_24

SITE: Stirling SW/PW - CG

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]erp.labreports@esdat.com.au

EMAIL INVOICES 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	WA OMP Water Suite WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
001	0089_SW370		29/05/2024 08:23 AM	WATER	ALS: 3 Non ALS: 0	No	X		
002	0089_PW345		29/05/2024 08:24 AM	WATER	ALS: 3 Non ALS: 0	No	X		
003	0089_PW369		29/05/2024 08:24 AM	WATER	ALS: 3 Non ALS: 0	No	X		
004	0089_PW367		29/05/2024 08:29 AM	WATER	ALS: 3 Non ALS: 0	No	X		
005	0089_PW368		29/05/2024 10:09 AM	WATER	ALS: 3 Non ALS: 0	No	X		
006	0089_SW371		29/05/2024 10:09 AM	WATER	ALS: 3 Non ALS: 0	No	X		
007	0089_SW305		29/05/2024 10:12 AM	WATER	ALS: 3 Non ALS: 0	No	X		

CHAIN OF CUSTODY

COC#: **68325** *ALS Laboratory:* EP Perth Environmental

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

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP_24

SITE: Stirling SW/PW - CG

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted] derp.labreports@esdat.com.au

EMAIL INVOICES 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	WA OMP Water Suite WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
008	0089_PW304		29/05/2024 10:13 AM	WATER	ALS: 2 Non ALS: 1	No	X		

CHAIN OF CUSTODY

ALS COC#: 68325 ALS Laboratory: EP Perth Environmental

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

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP_24

SITE: Stirling SW/PW - CG

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted], derp.labreports@esdat.com.au

EMAIL INVOICES 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	0089_SW370	Clear Plastic Bottle - Natural	125 mL	00070821217812	Green	No	
001	0089_SW370	HDPE (no PTFE)	20 mL	00352312048746	Grey	No	
001	0089_SW370	HDPE (no PTFE)	20 mL	00351221024692	Grey	No	
002	0089_PW345	HDPE (no PTFE)	20 mL	00351221024871	Grey	No	
002	0089_PW345	HDPE (no PTFE)	20 mL	00351221024831	Grey	No	
002	0089_PW345	Clear Plastic Bottle - Natural	125 mL	00071121178108	Green	No	
003	0089_PW369	HDPE (no PTFE)	20 mL	00352312048496	Grey	No	
003	0089_PW369	HDPE (no PTFE)	20 mL	00352312048797	Grey	No	
003	0089_PW369	Clear Plastic Bottle - Natural	125 mL	00070821217721	Green	No	
004	0089_PW367	HDPE (no PTFE)	20 mL	00352312048584	Grey	No	
004	0089_PW367	HDPE (no PTFE)	20 mL	00352312048594	Grey	No	
004	0089_PW367	Clear Plastic Bottle - Natural	125 mL	00070821217683	Green	No	
005	0089_PW368	HDPE (no PTFE)	20 mL	00351221024702	Grey	No	
005	0089_PW368	HDPE (no PTFE)	20 mL	00352312048581	Grey	No	
005	0089_PW368	Clear Plastic Bottle - Natural	125 mL	00070821217791	Green	No	
006	0089_SW371	Clear Plastic Bottle - Natural	125 mL	00070821217679	Green	No	
006	0089_SW371	HDPE (no PTFE)	20 mL	00352312048634	Grey	No	
006	0089_SW371	HDPE (no PTFE)	20 mL	00351221024793	Grey	No	
007	0089_SW305	HDPE (no PTFE)	20 mL	00352312048546	Grey	No	
007	0089_SW305	HDPE (no PTFE)	20 mL	00352312048604	Grey	No	
007	0089_SW305	Clear Plastic Bottle - Natural	125 mL	00070821217725	Green	No	
008	0089_PW304	HDPE (no PTFE)	20 mL	00351221024614	Grey	No	
008	0089_PW304	HDPE (no PTFE)	20 mL	00352312048547	Grey	No	

Total Bottle Count: ALS: 23, Non ALS: 1

SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : **EP2407420**

Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: [redacted]
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
E-mail	: [redacted]stantec.com	E-mail	: [redacted]alsglobal.com
Telephone	: ----	Telephone	: +61-8-9406 1301
Facsimile	: ----	Facsimile	: +61-8-9406 1399
Project	: WA_0089_PFASOMP_24	Page	: 1 of 2
Order number	: pfas-omp/Stirling	Quote number	: ES2022MWHAUS0002 (SY/139/19 B)
C-O-C number	: 68325	QC Level	: NEPM 2013 B3 & ALS QC Standard
Site	: Stirling SW/PW - CG		
Sampler	: [redacted]		

Dates

Date Samples Received	: 30-May-2024 12:15	Issue Date	: 31-May-2024
Client Requested Due Date	: 11-Jun-2024	Scheduled Reporting Date	: **11-Jun-2024**

Delivery Details

Mode of Delivery	: Carrier	Security Seal	: Not Available
No. of coolers/boxes	: 2	Temperature	: 16.7 - Ice present
Receipt Detail	:	No. of samples received / analysed	: 8 / 8

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 see scanned COC for sample discrepencies: extra samples , samples not received etc.
- Please direct any queries related to sample condition / numbering / breakages to Sample Receipt (Samples.Perth@alsglobal.com)
- Analytical work for this work order will be conducted at ALS Environmental Perth.
- Please direct any turnaround / technical queries to the laboratory contact designated above.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months) from receipt of samples.
- **pH analysis should be conducted within 6 hours of sampling.**
- **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.**
- 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 (30 analytes)	WATER - NT-01 & 02 Ca, Mg, Na, K, Cl, SO4, Alkalinity
EP2407420-001	29-May-2024 08:23	0089_SW370_240529	✓	✓
EP2407420-002	29-May-2024 08:24	0089_PW345_240529	✓	✓
EP2407420-003	29-May-2024 08:24	0089_PW369_240529	✓	✓
EP2407420-004	29-May-2024 08:29	0089_PW367_240529	✓	✓
EP2407420-005	29-May-2024 10:09	0089_PW368_240529	✓	✓
EP2407420-006	29-May-2024 10:09	0089_SW371_240529	✓	✓
EP2407420-007	29-May-2024 10:12	0089_SW305_240529	✓	✓
EP2407420-008	29-May-2024 10:13	0089_PW304_240529	✓	✓

Proactive Holding Time Report

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

Requested Deliverables

[redacted]
- A4 - AU Tax Invoice (INV) — Email — [redacted]cardno.com.au

DERP LAB REPORTS
- EDI Format - ESDAT (ESDAT) — Email — derp.labreports@esdat.com.au

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

CERTIFICATE OF ANALYSIS

Work Order	: **EP2407420**	Page	: 1 of 9
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: [redacted]
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: +61-8-9406 1301
Project	: WA_0089_PFASOMP_24	Date Samples Received	: 30-May-2024 12:15
Order number	: pfas-omp/Stirling	Date Analysis Commenced	: 31-May-2024
C-O-C number	: 68325	Issue Date	: 11-Jun-2024 16:51
Sampler	: [redacted] [redacted]		
Site	: Stirling SW/PW - CG		
Quote number	: SY/139/19 B		
No. of samples received	: 8		
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]	Inorganics Supervisor	Perth Inorganics, Wangara, WA
[redacted]	Laboratory Manager (Perth)	Perth Inorganics, Wangara, WA
[redacted]	Senior Organic Chemist	Perth Organics, Wangara, WA

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.
- As per QWI – EN55-3 Data Interpreting Procedures, Ionic balances are typically calculated using Major Anions - Chloride, Alkalinity and Sulfate; and Major Cations - Calcium, Magnesium, Potassium and Sodium. Where applicable and dependent upon sample matrix, the Ionic Balance may also include the additional contribution of Ammonia, Dissolved Metals by ICPMS and H+ to the Cations and Nitrate, SiO2 and Fluoride to the Anions.
- Sodium Adsorption Ratio (where reported): Where results for Na, Ca or Mg are <LOR, a concentration at half the reported LOR is incorporated into the SAR calculation. This represents a conservative approach for Na relative to the assumption that <LOR = zero concentration and a conservative approach for Ca & Mg relative to the assumption that <LOR is equivalent to the LOR concentration.
- 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.
- ED045G: The presence of Thiocyanate, Thiosulfate and Sulfite can positively contribute to the chloride result, thereby may bias results higher than expected. Results should be scrutinised accordingly.

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_SW370_240529	0089_PW345_240529	0089_PW369_240529	0089_PW367_240529	0089_PW368_240529
				Sampling date / time	29-May-2024 08:23	29-May-2024 08:24	29-May-2024 08:24	29-May-2024 08:29	29-May-2024 10:09
Compound	CAS Number	LOR	Unit		EP2407420-001	EP2407420-002	EP2407420-003	EP2407420-004	EP2407420-005
					Result	Result	Result	Result	Result
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	<1	<1	<1	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	<1	<1	<1	<1
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		**144**	**136**	**124**	**138**	**181**
Total Alkalinity as CaCO3	----	1	mg/L		**144**	**136**	**124**	**138**	**181**
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		**2350**	**2150**	**2430**	**1980**	**2340**
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		**21400**	**17400**	**21400**	**16200**	**20600**
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		**432**	**352**	**438**	**343**	**423**
Magnesium	7439-95-4	1	mg/L		**1310**	**1100**	**1380**	**1040**	**1330**
Sodium	7440-23-5	1	mg/L		**11000**	**9300**	**11400**	**8580**	**11000**
Potassium	7440-09-7	1	mg/L		**404**	**348**	**412**	**332**	**400**
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		**655**	**538**	**657**	**501**	**633**
ø Total Cations	----	0.01	meq/L		**618**	**522**	**642**	**484**	**619**
ø Ionic Balance	----	0.01	%		**2.93**	**1.58**	**1.15**	**1.68**	**1.13**
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	**0.03**	<0.01	**0.02**
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_SW370_240529	0089_PW345_240529	0089_PW369_240529	0089_PW367_240529	0089_PW368_240529
				Sampling date / time	29-May-2024 08:23	29-May-2024 08:24	29-May-2024 08:24	29-May-2024 08:29	29-May-2024 10:09
Compound	CAS Number	LOR	Unit		EP2407420-001	EP2407420-002	EP2407420-003	EP2407420-004	EP2407420-005
					Result	Result	Result	Result	Result
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
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									

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_SW370_240529	0089_PW345_240529	0089_PW369_240529	0089_PW367_240529	0089_PW368_240529
				Sampling date / time	29-May-2024 08:23	29-May-2024 08:24	29-May-2024 08:24	29-May-2024 08:29	29-May-2024 10:09
Compound	CAS Number	LOR	Unit		EP2407420-001	EP2407420-002	EP2407420-003	EP2407420-004	EP2407420-005
					Result	Result	Result	Result	Result
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
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	**0.03**	<0.01	**0.03**
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		**0.01**	<0.01	**0.03**	<0.01	**0.03**
Sum of PFAS (WA DER List)	----	0.01	µg/L		**0.01**	<0.01	**0.03**	<0.01	**0.03**
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**104**	**115**	**117**	**109**	**97.1**
13C8-PFOA	----	0.02	%		**85.3**	**93.2**	**73.9**	**90.1**	**78.7**

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_SW371_240529	0089_SW305_240529	0089_PW304_240529	----	----
				Sampling date / time	29-May-2024 10:09	29-May-2024 10:12	29-May-2024 10:13	----	----
Compound	CAS Number	LOR	Unit		EP2407420-006	EP2407420-007	EP2407420-008	--------	--------
					Result	Result	Result	----	----
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	<1	<1	----	----
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	<1	<1	----	----
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		128	131	194	----	----
Total Alkalinity as CaCO3	----	1	mg/L		128	131	194	----	----
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		2450	2400	2340	----	----
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		21000	21300	20200	----	----
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		437	459	411	----	----
Magnesium	7439-95-4	1	mg/L		1340	1420	1240	----	----
Sodium	7440-23-5	1	mg/L		11000	11800	10300	----	----
Potassium	7440-09-7	1	mg/L		410	431	388	----	----
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		646	653	622	----	----
ø Total Cations	----	0.01	meq/L		621	664	580	----	----
ø Ionic Balance	----	0.01	%		1.96	0.81	3.48	----	----
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		0.01	<0.01	0.05	----	----
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	<0.02	<0.02	----	----

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_SW371_240529	0089_SW305_240529	0089_PW304_240529	----	----
				Sampling date / time	29-May-2024 10:09	29-May-2024 10:12	29-May-2024 10:13	----	----
Compound	CAS Number	LOR	Unit		EP2407420-006	EP2407420-007	EP2407420-008	--------	--------
					Result	Result	Result	----	----
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	----	----
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									

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_SW371_240529	0089_SW305_240529	0089_PW304_240529	----	----
				Sampling date / time	29-May-2024 10:09	29-May-2024 10:12	29-May-2024 10:13	----	----
Compound	CAS Number	LOR	Unit		EP2407420-006	EP2407420-007	EP2407420-008	--------	--------
					Result	Result	Result	----	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
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**	<0.01	**0.06**	----	----
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		**0.01**	<0.01	**0.06**	----	----
Sum of PFAS (WA DER List)	----	0.01	µg/L		**0.01**	<0.01	**0.06**	----	----
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**109**	**99.1**	**106**	----	----
13C8-PFOA	----	0.02	%		**85.6**	**81.6**	**79.9**	----	----

Surrogate Control Limits

Sub-Matrix: SURFACE WATER		Recovery Limits (%)	
Compound	CAS Number	Low	High
EP231S: PFAS Surrogate			
13C4-PFOS	----	65	140
13C8-PFOA	----	71	133

QUALITY CONTROL REPORT

Work Order	: **EP2407420**	Page	: 1 of 10
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: [redacted]
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: +61-8-9406 1301
Project	: WA_0089_PFASOMP_24	Date Samples Received	: 30-May-2024
Order number	: pfas-omp/Stirling	Date Analysis Commenced	: 31-May-2024
C-O-C number	: 68325	Issue Date	: 11-Jun-2024
Sampler	: [redacted] [redacted]		
Site	: Stirling SW/PW - CG		
Quote number	: SY/139/19 B		
No. of samples received	: 8		
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]	Inorganics Supervisor	Perth Inorganics, Wangara, WA
[redacted]	Laboratory Manager (Perth)	Perth Inorganics, Wangara, WA
[redacted]	Senior Organic Chemist	Perth Organics, Wangara, WA

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 (%)
ED037P: Alkalinity by PC Titrator (QC Lot: 5837685)									
EP2407418-005	Anonymous	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	533	536	0.5	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	533	536	0.5	0% - 20%
EP2407420-003	0089_PW369_240529	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	124	124	0.0	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	124	124	0.0	0% - 20%
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QC Lot: 5829570)									
EP2407418-005	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	45	45	0.0	0% - 20%
EP2407420-004	0089_PW367_240529	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	1980	1920	3.0	0% - 20%
ED045G: Chloride by Discrete Analyser (QC Lot: 5829571)									
EP2407418-005	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	273	268	2.1	0% - 20%
EP2407420-004	0089_PW367_240529	ED045G: Chloride	16887-00-6	1	mg/L	16200	16000	1.3	0% - 20%
ED093F: Dissolved Major Cations (QC Lot: 5833501)									
EP2407420-001	0089_SW370_240529	ED093F: Calcium	7440-70-2	1	mg/L	432	445	3.0	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	1310	1360	3.4	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	11000	11300	2.5	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	404	413	2.2	0% - 20%
EP2407422-003	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	454	445	2.0	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	1370	1350	1.9	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	11200	11200	0.3	0% - 20%

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 (%)
ED093F: Dissolved Major Cations (QC Lot: 5833501) - continued									
EP2407422-003	Anonymous	ED093F: Potassium	7440-09-7	1	mg/L	407	403	0.9	0% - 20%
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 5835304)									
EP2407418-012	Anonymous	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
EP2407418-014	Anonymous	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
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 5835304)									
EP2407418-012	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
EP2407418-014	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

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: 5835304)									
EP2407418-012	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
EP2407418-014	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: 5835304)									
EP2407418-012	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
EP2407418-014	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

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: 5835304) - continued									
EP2407418-014	Anonymous	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: 5835304)									
EP2407418-012	Anonymous	EP231X: Sum of PFAS	----	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	<0.01	<0.01	0.0	No Limit
EP2407418-014	Anonymous	EP231X: Sum of PFAS	----	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	<0.01	<0.01	0.0	No Limit

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
ED037P: Alkalinity by PC Titrator (QCLot: 5837685)								
ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	----	----	----	----
ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	----	----	----	----
ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	<1	----	----	----	----
ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	<1	20 mg/L	99.6	85.1	126
				<1	200 mg/L	101	90.5	111
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 5829570)								
ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<1	25 mg/L	99.1	89.9	112
				<1	500 mg/L	93.8	89.9	112
ED045G: Chloride by Discrete Analyser (QCLot: 5829571)								
ED045G: Chloride	16887-00-6	1	mg/L	<1	10 mg/L	97.2	88.6	113
				<1	1000 mg/L	106	88.6	113
ED093F: Dissolved Major Cations (QCLot: 5833501)								
ED093F: Calcium	7440-70-2	1	mg/L	<1	50 mg/L	104	86.5	117
ED093F: Magnesium	7439-95-4	1	mg/L	<1	50 mg/L	104	88.4	110
ED093F: Sodium	7440-23-5	1	mg/L	<1	50 mg/L	103	91.4	113
ED093F: Potassium	7440-09-7	1	mg/L	<1	50 mg/L	104	84.6	108
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5835284)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.2218 µg/L	95.1	72.0	130
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.2352 µg/L	100	71.0	127
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	0.2373 µg/L	95.9	68.0	131
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.238 µg/L	107	69.0	134
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.232 µg/L	95.0	65.0	140
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.241 µg/L	92.9	53.0	142
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5835304)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.2218 µg/L	92.6	72.0	130
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.2352 µg/L	98.8	71.0	127
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	0.2373 µg/L	94.6	68.0	131
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.238 µg/L	97.3	69.0	134
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.232 µg/L	85.1	65.0	140
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.241 µg/L	93.8	53.0	142

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: 5835284)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	1.25 µg/L	112	73.0	129
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	0.25 µg/L	81.8	72.0	129
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	0.25 µg/L	116	72.0	129
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	0.25 µg/L	103	72.0	130
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	0.25 µg/L	104	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	89.8	71.0	129
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	0.25 µg/L	87.6	69.0	133
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	0.25 µg/L	98.8	72.0	134
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	0.25 µg/L	90.6	65.0	144
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	0.25 µg/L	106	71.0	132
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5835304)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	1.25 µg/L	105	73.0	129
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	0.25 µg/L	84.6	72.0	129
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	0.25 µg/L	112	72.0	129
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	0.25 µg/L	102	72.0	130
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	0.25 µg/L	109	71.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	0.25 µg/L	92.2	69.0	130
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	0.25 µg/L	94.8	71.0	129
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	0.25 µg/L	82.0	69.0	133
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	0.25 µg/L	101	72.0	134
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	0.25 µg/L	136	65.0	144
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	0.25 µg/L	102	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5835284)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.25 µg/L	90.6	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	0.625 µg/L	111	68.0	141
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	0.625 µg/L	69.8	60.5	138
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	0.625 µg/L	109	68.3	134
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	0.625 µg/L	105	62.2	138
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	0.25 µg/L	106	65.0	136
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	0.25 µg/L	123	61.0	135

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
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5835304)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.25 µg/L	92.6	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	0.625 µg/L	108	68.0	141
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	0.625 µg/L	94.3	60.5	138
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	0.625 µg/L	104	68.3	134
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	0.625 µg/L	106	62.2	138
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	0.25 µg/L	88.2	65.0	136
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	0.25 µg/L	97.6	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5835284)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.2343 µg/L	109	63.0	143
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	0.2378 µg/L	106	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	0.24 µg/L	99.4	67.0	138
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	0.241 µg/L	94.0	64.2	133
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5835304)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.2343 µg/L	103	63.0	143
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	0.2378 µg/L	108	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	0.24 µg/L	102	67.0	138
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	0.241 µg/L	88.4	64.2	133
EP231P: PFAS Sums (QCLot: 5835284)								
EP231X: Sum of PFAS	----	0.01	µg/L	<0.01	----	----	----	----
EP231X: Sum of PFHxS and PFOS	355-46-4/17 63-23-1	0.01	µg/L	<0.01	----	----	----	----
EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	<0.01	----	----	----	----
EP231P: PFAS Sums (QCLot: 5835304)								
EP231X: Sum of PFAS	----	0.01	µg/L	<0.01	----	----	----	----
EP231X: Sum of PFHxS and PFOS	355-46-4/17 63-23-1	0.01	µg/L	<0.01	----	----	----	----
EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	<0.01	----	----	----	----

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**

Matrix Spike (MS) Report

Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 5829570)							
EP2407418-005	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	100 mg/L	107	70.4	130
ED045G: Chloride by Discrete Analyser (QCLot: 5829571)							
EP2407418-005	Anonymous	ED045G: Chloride	16887-00-6	200 mg/L	110	70.0	130
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5835304)							
EP2407418-013	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.2218 µg/L	98.3	72.0	129
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.232 µg/L	108	71.0	127
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.2352 µg/L	102	68.0	129
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.238 µg/L	106	69.0	134
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.232 µg/L	91.4	65.0	140
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.241 µg/L	82.1	53.0	129
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5835304)							
EP2407418-013	Anonymous	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	1.25 µg/L	111	73.0	142
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.25 µg/L	78.6	72.0	129
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.25 µg/L	115	72.0	129
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.25 µg/L	106	72.0	130
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.25 µg/L	111	71.0	133
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.25 µg/L	96.8	69.0	130
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.25 µg/L	102	71.0	134
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.25 µg/L	98.4	69.0	133
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.25 µg/L	104	72.0	134
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.25 µg/L	115	65.0	144
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.25 µg/L	105	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5835304)							
EP2407418-013	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.25 µg/L	92.6	59.0	135
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.625 µg/L	90.7	70.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.625 µg/L	74.2	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.625 µg/L	114	70.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.625 µg/L	109	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.25 µg/L	99.8	65.0	136
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.25 µg/L	129	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5835304)							
EP2407418-013	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.234 µg/L	110	63.0	143
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.2378 µg/L	114	64.0	140

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: 5835304) - continued							
EP2407418-013	Anonymous	EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.24 µg/L	114	67.0	138
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.2415 µg/L	83.0	70.0	130

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **EP2407420**	Page	: 1 of 5
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Telephone	: +61-8-9406 1301
Project	: WA_0089_PFASOMP_24	Date Samples Received	: 30-May-2024
Site	: Stirling SW/PW - CG	Issue Date	: 11-Jun-2024
Sampler	: [redacted] [redacted]	No. of samples received	: 8
Order number	: pfas-omp/Stirling	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, where applicable to the methodology, 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	2	27	7.41	10.00	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)						
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	27	3.70	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			Analysis		
			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
ED037P: Alkalinity by PC Titrator								
Clear Plastic Bottle - Natural (ED037-P)								
0089_SW370_240529,	0089_PW345_240529,	**29-May-2024**	**----**	----	----	**05-Jun-2024**	12-Jun-2024	✓
0089_PW369_240529,	0089_PW367_240529,							
0089_PW368_240529,	0089_SW371_240529,							
0089_SW305_240529,	0089_PW304_240529							
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA								
Clear Plastic Bottle - Natural (ED041G)								
0089_SW370_240529,	0089_PW345_240529,	**29-May-2024**	**----**	----	----	**11-Jun-2024**	26-Jun-2024	✓
0089_PW369_240529,	0089_PW367_240529,							
0089_PW368_240529,	0089_SW371_240529,							
0089_SW305_240529,	0089_PW304_240529							
ED045G: Chloride by Discrete Analyser								
Clear Plastic Bottle - Natural (ED045G)								
0089_SW370_240529,	0089_PW345_240529,	**29-May-2024**	**----**	----	----	**11-Jun-2024**	26-Jun-2024	✓
0089_PW369_240529,	0089_PW367_240529,							
0089_PW368_240529,	0089_SW371_240529,							
0089_SW305_240529,	0089_PW304_240529							
ED093F: Dissolved Major Cations								
Clear Plastic Bottle - Natural (ED093F)								
0089_SW370_240529,	0089_PW345_240529,	**29-May-2024**	**----**	----	----	**04-Jun-2024**	05-Jun-2024	✓
0089_PW369_240529,	0089_PW367_240529,							
0089_PW368_240529,	0089_SW371_240529,							
0089_SW305_240529,	0089_PW304_240529							

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)								
0089_SW370_240529,	0089_PW345_240529,	**29-May-2024**	**07-Jun-2024**	25-Nov-2024	✓	**07-Jun-2024**	25-Nov-2024	✓
0089_PW369_240529,	0089_PW367_240529,							
0089_PW368_240529,	0089_SW371_240529,							
0089_SW305_240529,	0089_PW304_240529							
EP231B: Perfluoroalkyl Carboxylic Acids								
HDPE (no PTFE) (EP231X)								
0089_SW370_240529,	0089_PW345_240529,	**29-May-2024**	**07-Jun-2024**	25-Nov-2024	✓	**07-Jun-2024**	25-Nov-2024	✓
0089_PW369_240529,	0089_PW367_240529,							
0089_PW368_240529,	0089_SW371_240529,							
0089_SW305_240529,	0089_PW304_240529							
EP231C: Perfluoroalkyl Sulfonamides								
HDPE (no PTFE) (EP231X)								
0089_SW370_240529,	0089_PW345_240529,	**29-May-2024**	**07-Jun-2024**	25-Nov-2024	✓	**07-Jun-2024**	25-Nov-2024	✓
0089_PW369_240529,	0089_PW367_240529,							
0089_PW368_240529,	0089_SW371_240529,							
0089_SW305_240529,	0089_PW304_240529							
EP231D: (n:2) Fluorotelomer Sulfonic Acids								
HDPE (no PTFE) (EP231X)								
0089_SW370_240529,	0089_PW345_240529,	**29-May-2024**	**07-Jun-2024**	25-Nov-2024	✓	**07-Jun-2024**	25-Nov-2024	✓
0089_PW369_240529,	0089_PW367_240529,							
0089_PW368_240529,	0089_SW371_240529,							
0089_SW305_240529,	0089_PW304_240529							
EP231P: PFAS Sums								
HDPE (no PTFE) (EP231X)								
0089_SW370_240529,	0089_PW345_240529,	**29-May-2024**	**07-Jun-2024**	25-Nov-2024	✓	**07-Jun-2024**	25-Nov-2024	✓
0089_PW369_240529,	0089_PW367_240529,							
0089_PW368_240529,	0089_SW371_240529,							
0089_SW305_240529,	0089_PW304_240529							

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)							
Alkalinity by Auto Titrator	ED037-P	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	27	**7.41**	**10.00**	×	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Alkalinity by Auto Titrator	ED037-P	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	27	**7.41**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Alkalinity by Auto Titrator	ED037-P	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	27	**7.41**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Chloride by Discrete Analyser	ED045G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	27	**3.70**	**5.00**	×	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	20	**5.00**	**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
Alkalinity by Auto Titrator	ED037-P	WATER	In house: Referenced to APHA 2320 B This procedure determines alkalinity by automated measurement (e.g. PC Titrate) on a settled supernatant aliquot of the sample using pH 4.5 for indicating the total alkalinity end-point. This method is compliant with NEPM Schedule B(3)
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	WATER	In house: Referenced to APHA 4500-SO4. Dissolved sulfate is determined in a 0.45um filtered sample. Sulfate ions are converted to a barium sulfate suspension in an acetic acid medium with barium chloride. Light absorbance of the BaSO4 suspension is measured by a photometer and the SO4-2 concentration is determined by comparison of the reading with a standard curve. This method is compliant with NEPM Schedule B(3)
Chloride by Discrete Analyser	ED045G	WATER	In house: Referenced to APHA 4500 Cl - G.The thiocyanate ion is liberated from mercuric thiocyanate through sequestration of mercury by the chloride ion to form non-ionised mercuric chloride. In the presence of ferric ions the liberated thiocynate forms highly-coloured ferric thiocynate which is measured at 480 nm.
Major Cations - Dissolved	ED093F	WATER	In house: Referenced to APHA 3120 and 3125; USEPA SW 846 - 6010 and 6020; Cations are determined by either ICP-AES or ICP-MS techniques. This method is compliant with NEPM Schedule B(3) Sodium Adsorption Ratio is calculated from Ca, Mg and Na which determined by ALS in house method QWI-EN/ED093F. This method is compliant with NEPM Schedule B(3) Hardness parameters are calculated based on APHA 2340 B. This method is compliant with NEPM Schedule B(3)
Ionic Balance by PCT DA and Turbi SO4 DA	* EN055 - PG	WATER	In house: Referenced to APHA 1030F. This method is compliant with NEPM Schedule B(3)
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.

ALSCompass
SAMPLING *Intelligence*

ALS

Environmental Division
Perth
Work Order Reference
EP2407421

Telephone : +61-8-9406 1301

Custody Document for Submissions via ALS Compass App

Project: WA-0089-PPASONP24 Client: STANTEC Project Manager: [redacted]

Phone: ( )

ALS Compass COC Reference: 68276 # Samples: 68293 68221 68274 68275 68271 68266 68272 68267 Sampler: [redacted]

Phone: ( )

Turnaround Requirements: Standard ✓ Urgent

Special Instructions:

Custody:

Relinquished by:	Received by:	Relinquished by:	Received by:
STANTEC	[redacted]		
Date / Time: 28/5/24 4 pm	Date / Time: 29/5 1230	Date / Time:	Date / Time:

CHAIN OF CUSTODY

COC#: 68326 ALS Laboratory: EP Perth Environmental

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

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP_24

SITE: Stirling SD - CG

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER:

CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted]derp.labreports@esdat.com.au

EMAIL INVOICES 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 Sediments SEDIMENT	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
001	0089_SD367		29/05/2024 08:30 AM	SOIL	ALS: 1 Non ALS: 0	No	X		
002	0089_SD345		29/05/2024 08:30 AM	SOIL	ALS: 1 Non ALS: 0	No	X		
003	0089_SD369		29/05/2024 08:31 AM	SOIL	ALS: 1 Non ALS: 0	No	X		
004	0089_SD368		29/05/2024 10:08 AM	SOIL	ALS: 1 Non ALS: 0	No	X		
005	0089_SD304		29/05/2024 10:14 AM	SOIL	ALS: 1 Non ALS: 0	No	X		

CHAIN OF CUSTODY

COC#: 68326 *ALS Laboratory:* EP Perth Environmental

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

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMF_24

SITE: Stirling SD - CG

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO [redacted] derp.labreports@esdat.com.au

EMAIL INVOICES 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	0089_SD367	HDPE Soil Jar	200 mL	0062122049096	Grey	No	
002	0089_SD345	HDPE Soil Jar	200 mL	0062122049072	Grey	No	
003	0089_SD369	HDPE Soil Jar	200 mL	0062122049097	Grey	No	
004	0089_SD368	HDPE Soil Jar	200 mL	0062122049111	Grey	No	
005	0089_SD304	HDPE Soil Jar	200 mL	0062122049171	Grey	No	

Total Bottle Count: ALS: 5, Non ALS: 0

SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : **EP2407421**

Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: [redacted]
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
E-mail	: [redacted]stantec.com	E-mail	: [redacted]alsglobal.com
Telephone	: ----	Telephone	: +61-8-9406 1301
Facsimile	: ----	Facsimile	: +61-8-9406 1399
Project	: WA_0089_PFASOMP_24	Page	: 1 of 2
Order number	: pfas-omp/Stirling	Quote number	: ES2022MWHAUS0002 (SY/139/19 B)
C-O-C number	: 68326	QC Level	: NEPM 2013 B3 & ALS QC Standard
Site	: Stirling SD - CG		
Sampler	: [redacted]		

Dates

Date Samples Received	: 29-May-2024 12:30	Issue Date	: 30-May-2024
Client Requested Due Date	: 10-Jun-2024	Scheduled Reporting Date	: **10-Jun-2024**

Delivery Details

Mode of Delivery	: Carrier	Security Seal	: Not Available
No. of coolers/boxes	: 1	Temperature	: 14.1 - Ice present
Receipt Detail	:	No. of samples received / analysed	: 5 / 5

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 see scanned COC for sample discrepencies: extra samples , samples not received etc.
- Please direct any queries related to sample condition / numbering / breakages to Sample Receipt (Samples.Perth@alsglobal.com)
- Analytical work for this work order will be conducted at ALS Environmental Perth.
- Please direct any turnaround / technical queries to the laboratory contact designated above.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months) from receipt of samples.
- **pH analysis should be conducted within 6 hours of sampling.**
- **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.**
- 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: **SOIL**

Laboratory sample ID	Sampling date / time	Sample ID	SOIL - EA055-103 Moisture Content	SOIL - EP231X (solids) PFAS - Full Suite (30 analytes)
EP2407421-001	29-May-2024 08:30	0089_SD367_240529	✓	✓
EP2407421-002	29-May-2024 08:30	0089_SD345_240529	✓	✓
EP2407421-003	29-May-2024 08:31	0089_SD369_240529	✓	✓
EP2407421-004	29-May-2024 10:08	0089_SD368_240529	✓	✓
EP2407421-005	29-May-2024 10:14	0089_SD304_240529	✓	✓

Proactive Holding Time Report

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

Requested Deliverables

[redacted]
- A4 - AU Tax Invoice (INV) — Email — [redacted]cardno.com.au

DERP LAB REPORTS
- EDI Format - ESDAT (ESDAT) — Email — derp.labreports@esdat.com.au

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

CERTIFICATE OF ANALYSIS

Work Order	: **EP2407421**	Page	: 1 of 5
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: [redacted]
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: +61-8-9406 1301
Project	: WA_0089_PFASOMP_24	Date Samples Received	: 29-May-2024 12:30
Order number	: pfas-omp/Stirling	Date Analysis Commenced	: 05-Jun-2024
C-O-C number	: 68326	Issue Date	: 07-Jun-2024 16:16
Sampler	: [redacted]		
Site	: Stirling SD - CG		
Quote number	: SY/139/19 B		
No. of samples received	: 5		
No. of samples analysed	: 5		

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]	Laboratory Manager (Perth)	Perth Inorganics, Wangara, WA
[redacted]	Senior Organic Chemist	Perth Organics, Wangara, WA

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.

- 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 USEPA 1633 limits 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: SEDIMENT (Matrix: SOIL)				Sample ID	0089_SD367_240529	0089_SD345_240529	0089_SD369_240529	0089_SD368_240529	0089_SD304_240529
				Sampling date / time	29-May-2024 08:30	29-May-2024 08:30	29-May-2024 08:31	29-May-2024 10:08	29-May-2024 10:14
Compound	CAS Number	LOR	Unit		EP2407421-001	EP2407421-002	EP2407421-003	EP2407421-004	EP2407421-005
					Result	Result	Result	Result	Result
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content	----	0.1	%		**27.6**	**32.3**	**34.0**	**29.4**	**30.5**
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg		<0.001	<0.001	<0.001	<0.001	<0.001
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002

Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)				Sample ID	0089_SD367_240529	0089_SD345_240529	0089_SD369_240529	0089_SD368_240529	0089_SD304_240529
				Sampling date / time	29-May-2024 08:30	29-May-2024 08:30	29-May-2024 08:31	29-May-2024 10:08	29-May-2024 10:14
Compound	CAS Number	LOR	Unit		EP2407421-001	EP2407421-002	EP2407421-003	EP2407421-004	EP2407421-005
					Result	Result	Result	Result	Result
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
EP231P: PFAS Sums									
Sum of PFAS	----	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Sum of PFAS (WA DER List)	----	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.0002	%		**98.5**	**89.0**	**100**	**116**	**101**
13C8-PFOA	----	0.0002	%		**96.0**	**112**	**100**	**122**	**100**

Surrogate Control Limits

Sub-Matrix: **SEDIMENT**		Recovery Limits (%)	
Compound	*CAS Number*	*Low*	*High*
EP231S: PFAS Surrogate			
13C4-PFOS	----	76	136
13C8-PFOA	----	78	131

QUALITY CONTROL REPORT

Work Order	: **EP2407421**	Page	: 1 of 7
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: [redacted]
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: +61-8-9406 1301
Project	: WA_0089_PFASOMP_24	Date Samples Received	: 29-May-2024
Order number	: pfas-omp/Stirling	Date Analysis Commenced	: 05-Jun-2024
C-O-C number	: 68326	Issue Date	: 07-Jun-2024
Sampler	: [redacted] [redacted]		
Site	: Stirling SD - CG		
Quote number	: SY/139/19 B		
No. of samples received	: 5		
No. of samples analysed	: 5		

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]	Laboratory Manager (Perth)	Perth Inorganics, Wangara, WA
[redacted]	Senior Organic Chemist	Perth Organics, Wangara, WA

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: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
EA055: Moisture Content (Dried @ 105-110°C) (QC Lot: 5836323)									
EP2407336-001	Anonymous	EA055: Moisture Content	----	0.1	%	25.5	25.3	0.8	0% - 20%
EP2407412-005	Anonymous	EA055: Moisture Content	----	0.1	%	18.6	19.3	3.8	0% - 20%
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 5834300)									
EP2407336-004	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
EP2407412-008	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	0.0021	0.0020	0.0	0% - 50%
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 5834300)									
EP2407336-004	Anonymous	EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit

Sub-Matrix: **SOIL**

				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: 5834300) - continued									
EP2407336-004	Anonymous	EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	<0.001	0.0	No Limit
EP2407412-008	Anonymous	EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	<0.001	0.0	No Limit
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 5834300)									
EP2407336-004	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
EP2407412-008	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit

Sub-Matrix: **SOIL**

				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: 5834300) - continued									
EP2407412-008	Anonymous	EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 5834300)									
EP2407336-004	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
EP2407412-008	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
EP231P: PFAS Sums (QC Lot: 5834300)									
EP2407336-004	Anonymous	EP231X: Sum of PFAS	----	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Sum of PFAS (WA DER List)	----	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
EP2407412-008	Anonymous	EP231X: Sum of PFAS	----	0.0002	mg/kg	0.0021	0.0020	4.9	0% - 50%
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg	0.0021	0.0020	4.9	0% - 50%
		EP231X: Sum of PFAS (WA DER List)	----	0.0002	mg/kg	0.0021	0.0020	4.9	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: **SOIL**

				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: 5834300)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	0.0011 mg/kg	94.1	72.0	128
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	0.00125 mg/kg	76.0	73.0	123
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	0.00118 mg/kg	92.8	67.0	130
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	0.00119 mg/kg	105	70.0	132
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	0.00116 mg/kg	92.7	68.0	136
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	0.0012 mg/kg	93.8	59.0	134
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5834300)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	0.00625 mg/kg	87.9	71.0	135
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	0.00125 mg/kg	98.0	69.0	132
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	0.00125 mg/kg	105	70.0	132
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	0.00125 mg/kg	95.6	71.0	131
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	99.6	69.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	98.4	72.0	129
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	0.00125 mg/kg	89.6	69.0	133
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	98.0	64.0	136
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	88.8	69.0	135
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	98.4	66.0	139
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	0.00125 mg/kg	104	69.0	133
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5834300)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	0.00125 mg/kg	92.0	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	0.00312 mg/kg	99.5	59.6	143
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	0.00312 mg/kg	88.0	62.8	140
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	0.00312 mg/kg	121	61.5	139
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	0.00312 mg/kg	94.9	61.9	139
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	0.00125 mg/kg	98.4	63.0	144
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	0.00125 mg/kg	98.8	61.0	139
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5834300)								

Sub-Matrix: **SOIL**

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: 5834300) - continued								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	0.00117 mg/kg	106	62.0	145
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	0.00118 mg/kg	107	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	0.0012 mg/kg	99.6	65.0	137
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	0.0012 mg/kg	90.8	54.8	124
EP231P: PFAS Sums (QCLot: 5834300)								
EP231X: Sum of PFAS	----	0.0002	mg/kg	<0.0002	----	----	----	----
EP231X: Sum of PFHxS and PFOS	355-46-4/17 63-23-1	0.0002	mg/kg	<0.0002	----	----	----	----
EP231X: Sum of PFAS (WA DER List)	----	0.0002	mg/kg	<0.0002	----	----	----	----

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: **SOIL**

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: 5834300)							
EP2407336-005	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0011 mg/kg	96.4	72.0	128
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.00117 mg/kg	83.8	73.0	123
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.00118 mg/kg	92.8	67.0	130
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.00119 mg/kg	106	70.0	132
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.00116 mg/kg	87.8	68.0	136
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0012 mg/kg	91.2	59.0	134
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5834300)							
EP2407336-005	Anonymous	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.00625 mg/kg	93.9	71.0	135
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.00125 mg/kg	101	69.0	132
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.00125 mg/kg	109	70.0	132
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.00125 mg/kg	98.4	71.0	131
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.00125 mg/kg	104	69.0	133
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.00125 mg/kg	99.2	72.0	129
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.00125 mg/kg	101	69.0	133
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.00125 mg/kg	103	64.0	136
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.00125 mg/kg	84.4	69.0	135
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.00125 mg/kg	92.8	66.0	139
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.00125 mg/kg	102	69.0	133
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5834300)							

Sub-Matrix: **SOIL**

				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: 5834300) - continued							
EP2407336-005	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.00125 mg/kg	92.8	48.0	128
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.00312 mg/kg	83.5	60.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.00312 mg/kg	84.3	60.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.00312 mg/kg	105	60.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.00312 mg/kg	103	60.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.00125 mg/kg	80.4	63.0	144
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.00125 mg/kg	91.2	61.0	139
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5834300)							
EP2407336-005	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.00117 mg/kg	97.9	62.0	145
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.00118 mg/kg	109	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0012 mg/kg	107	65.0	137
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0012 mg/kg	82.5	60.0	130

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **EP2407421**	Page	: 1 of 4
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Telephone	: +61-8-9406 1301
Project	: WA_0089_PFASOMP_24	Date Samples Received	: 29-May-2024
Site	: Stirling SD - CG	Issue Date	: 07-Jun-2024
Sampler	: [redacted] [redacted]	No. of samples received	: 5
Order number	: pfas-omp/Stirling	No. of samples analysed	: 5

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, where applicable to the methodology, 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: **SOIL**

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
EA055: Moisture Content (Dried @ 105-110°C)							
HDPE Soil Jar (EA055)							
0089_SD367_240529, 0089_SD345_240529, 0089_SD369_240529, 0089_SD368_240529, 0089_SD304_240529	**29-May-2024**	**----**	----	----	**05-Jun-2024**	12-Jun-2024	✓
EP231A: Perfluoroalkyl Sulfonic Acids							
HDPE Soil Jar (EP231X)							
0089_SD367_240529, 0089_SD345_240529, 0089_SD369_240529, 0089_SD368_240529, 0089_SD304_240529	**29-May-2024**	**05-Jun-2024**	25-Nov-2024	✓	**05-Jun-2024**	15-Jul-2024	✓
EP231B: Perfluoroalkyl Carboxylic Acids							
HDPE Soil Jar (EP231X)							
0089_SD367_240529, 0089_SD345_240529, 0089_SD369_240529, 0089_SD368_240529, 0089_SD304_240529	**29-May-2024**	**05-Jun-2024**	25-Nov-2024	✓	**05-Jun-2024**	15-Jul-2024	✓
EP231C: Perfluoroalkyl Sulfonamides							
HDPE Soil Jar (EP231X)							
0089_SD367_240529, 0089_SD345_240529, 0089_SD369_240529, 0089_SD368_240529, 0089_SD304_240529	**29-May-2024**	**05-Jun-2024**	25-Nov-2024	✓	**05-Jun-2024**	15-Jul-2024	✓
EP231D: (n:2) Fluorotelomer Sulfonic Acids							
HDPE Soil Jar (EP231X)							
0089_SD367_240529, 0089_SD345_240529, 0089_SD369_240529, 0089_SD368_240529, 0089_SD304_240529	**29-May-2024**	**05-Jun-2024**	25-Nov-2024	✓	**05-Jun-2024**	15-Jul-2024	✓
EP231P: PFAS Sums							
HDPE Soil Jar (EP231X)							
0089_SD367_240529, 0089_SD345_240529, 0089_SD369_240529, 0089_SD368_240529, 0089_SD304_240529	**29-May-2024**	**05-Jun-2024**	25-Nov-2024	✓	**05-Jun-2024**	15-Jul-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: **SOIL**

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)							
Moisture Content	EA055	2	19	**10.53**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	20	**5.00**	**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
Moisture Content	EA055	SOIL	In house: A gravimetric procedure based on weight loss over a 12 hour drying period at 105-110 degrees C. This method is compliant with NEPM Schedule B(3).
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	SOIL	In-house: Analysis of soils by solvent extraction followed by LC-Electrospray-MS-MS, Negative Mode using MRM using internal standard quantitation. Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to a portion of soil which is then extracted with MTBE and an ion pairing reagent. A portion of extract is exchanged into the analytical solvent mixture, combined with an equal volume reagent water and 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
QuECheRS Extraction of Solids	* ORG71	SOIL	In house: Sequential extractions with Acetonitrile/Methanol by shaking. Extraction efficiency aided by the addition of salts under acidic conditions. Where relevant, interferences from co-extracted organics are removed with dispersive clean-up media (dSPE). The extract is either diluted or concentrated and exchanged into the analytical solvent.

ALSCompass
SAMPLING *Intelligence*

ALS

Environmental Division
Perth
Work Order Reference
EP2407422

Telephone : +61-8-9406 1301

Custody Document for Submissions via ALS Compass App

Project: WA-0089-PFASODP-24 Client: STANTEC Project Manager: [redacted]

ALS Compass COC Reference: 68323 68318 68334 68335 68326 68324 # Samples: 68325 Phone: ( )

Sampler: [redacted]

Turnaround Requirements: Standard ____ Urgent ____ Phone: ( )

Special Instructions:

Custody:

Relinquished by: STANTEC	Received by: [redacted]	Relinquished by:	Received by:
Date / Time: 29/5/24	Date / Time: 30/5 1215	Date / Time:	Date / Time:

CHAIN OF CUSTODY

ALS COC#: 68334 ALS Laboratory: EP Perth Environmental

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP_24

SITE: Stirling SW/PW - JS

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted]

SAMPLER MOBILE: [redacted]

EMAIL REPORTS TO: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL INVOICES TO: [redacted] derp.labreports@esdat.com.au

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

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	WA OMP Water Suite WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
001	0089_PW363		29/05/2024 10:14 AM	WATER	ALS: 3 Non ALS: 0	No	X		
002	0089_SW134		29/05/2024 10:15 AM	WATER	ALS: 3 Non ALS: 0	No	X		
003	0089_PW341		29/05/2024 10:16 AM	WATER	ALS: 5 Non ALS: 0	No	X		
004	0089_PW362		29/05/2024 10:32 AM	WATER	ALS: 3 Non ALS: 0	No	X		
005	0089_PW364		29/05/2024 10:44 AM	WATER	ALS: 3 Non ALS: 0	No	X		
006	0089_SW132		29/05/2024 10:48 AM	WATER	ALS: 5 Non ALS: 0	No	X		
007	0089_PW340		29/05/2024 10:54 AM	WATER	ALS: 3 Non ALS: 0	No	X		

CHAIN OF CUSTODY

COC#: 68334 *ALS Laboratory:* EP Perth Environmental

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP_24

SITE: Stirling SW/PW - JS

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted] derp.labreports@esdat.com.au

EMAIL INVOICES TO: [redacted]

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

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	WA OMP Water Suite WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
008	0089_PW335		29/05/2024 10:59 AM	WATER	ALS: 3 Non ALS: 0	No	X		
009	0089_SW130		29/05/2024 10:59 AM	WATER	ALS: 3 Non ALS: 0	No	X		

CHAIN OF CUSTODY

ALS COC#: 68334 ALS Laboratory: EP Perth Environmental

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP_24

SITE: Stirling SW/PW - JS

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted] derp.labreports@esdat.com.au

EMAIL INVOICES TO: [redacted]

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

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	0089_PW363	Clear Plastic Bottle - Natural	125 mL	00070821217719	Green	No	
001	0089_PW363	HDPE (no PTFE)	20 mL	00351221024781	Grey	No	
001	0089_PW363	HDPE (no PTFE)	20 mL	00352312048472	Grey	No	
002	0089_SW134	HDPE (no PTFE)	20 mL	00352312048474	Grey	No	
002	0089_SW134	HDPE (no PTFE)	20 mL	00352312048694	Grey	No	
002	0089_SW134	Clear Plastic Bottle - Natural	125 mL	00070821217670	Green	No	
003	0089_PW341	Clear Plastic Bottle - Natural	125 mL	00070821217739	Green	No	
003	0089_PW341	HDPE (no PTFE)	20 mL	00352312048668	Grey	No	
003	0089_PW341	HDPE (no PTFE)	20 mL	00351221024699	Grey	No	
003	0089_PW341	HDPE (no PTFE)	20 mL	00352312048782	Grey	No	
004	0089_PW362	Clear Plastic Bottle - Natural	125 mL	00070821217774	Green	No	
004	0089_PW362	HDPE (no PTFE)	20 mL	00352312048607	Grey	No	
004	0089_PW362	HDPE (no PTFE)	20 mL	00352312048539	Grey	No	
005	0089_PW364	HDPE (no PTFE)	20 mL	00351221024737	Grey	No	
005	0089_PW364	HDPE (no PTFE)	20 mL	00351221024834	Grey	No	
005	0089_PW364	Clear Plastic Bottle - Natural	125 mL	00070821217660	Green	No	
006	0089_SW132	Clear Plastic Bottle - Natural	125 mL	00070821217800	Green	No	
006	0089_SW132	HDPE (no PTFE)	20 mL	00351221024725	Grey	No	
006	0089_SW132	HDPE (no PTFE)	20 mL	00352312048775	Grey	No	
006	0089_SW132	HDPE (no PTFE)	20 mL	00351221024663	Grey	No	
006	0089_SW132	HDPE (no PTFE)	20 mL	00351221024705	Grey	No	
007	0089_PW340	Clear Plastic Bottle - Natural	125 mL	00070821217726	Green	No	
007	0089_PW340	HDPE (no PTFE)	20 mL	00351221024704	Grey	No	
007	0089_PW340	HDPE (no PTFE)	20 mL	00352312048577	Grey	No	
008	0089_PW335	Clear Plastic Bottle - Natural	125 mL	00070821217742	Green	No	

CHAIN OF CUSTODY

COC#: 68334 ALS Laboratory: EP Perth Environmental

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

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP_24

SITE: Stirling SW/PW - JS

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted] SAMPLER MOBILE [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted], derp.labreports@esdat.com.au

EMAIL INVOICES 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:

008	0089_PW335	HDPE (no PTFE)	20 mL	00352312048511	Grey	No	
008	0089_PW335	HDPE (no PTFE)	20 mL	00352312048783	Grey	No	
009	0089_SW130	HDPE (no PTFE)	20 mL	00352312048490	Grey	No	
009	0089_SW130	Clear Plastic Bottle - Natural	125 mL	00070821217665	Green	No	
009	0089_SW130	HDPE (no PTFE)	20 mL	00352312048576	Grey	No	

Total Bottle Count: ALS: 31, Non ALS: 0

SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : **EP2407422**

Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: [redacted]
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
E-mail	: [redacted]stantec.com	E-mail	: [redacted]alsglobal.com
Telephone	: ----	Telephone	: +61-8-9406 1301
Facsimile	: ----	Facsimile	: +61-8-9406 1399
Project	: WA_0089_PFASOMP_24	Page	: 1 of 2
Order number	: pfas-omp/Stirling	Quote number	: ES2022MWHAUS0002 (SY/139/19 B)
C-O-C number	: 68334	QC Level	: NEPM 2013 B3 & ALS QC Standard
Site	: Stirling SW/PW - JS		
Sampler	: [redacted]		

Dates

Date Samples Received	: 30-May-2024 12:15	Issue Date	: 31-May-2024
Client Requested Due Date	: 11-Jun-2024	Scheduled Reporting Date	: **11-Jun-2024**

Delivery Details

Mode of Delivery	: Carrier	Security Seal	: Not Available
No. of coolers/boxes	: 2	Temperature	: 16.7 - Ice present
Receipt Detail	:	No. of samples received / analysed	: 9 / 9

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 see scanned COC for sample discrepencies: extra samples , samples not received etc.
- Please direct any queries related to sample condition / numbering / breakages to Sample Receipt (Samples.Perth@alsglobal.com)
- Analytical work for this work order will be conducted at ALS Environmental Perth.
- Please direct any turnaround / technical queries to the laboratory contact designated above.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months) from receipt of samples.
- **pH analysis should be conducted within 6 hours of sampling.**
- **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.**
- 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 (30 analytes)	WATER - NT-01 & 02 Ca, Mg, Na, K, Cl, SO4, Alkalinity
EP2407422-001	29-May-2024 10:14	0089_PW363_240529	✓	✓
EP2407422-002	29-May-2024 10:15	0089_SW134_240529	✓	✓
EP2407422-003	29-May-2024 10:16	0089_PW341_240529	✓	✓
EP2407422-004	29-May-2024 10:32	0089_PW362_240529	✓	✓
EP2407422-005	29-May-2024 10:44	0089_PW364_240529	✓	✓
EP2407422-006	29-May-2024 10:48	0089_SW132_240529	✓	✓
EP2407422-007	29-May-2024 10:54	0089_PW340_240529	✓	✓
EP2407422-008	29-May-2024 10:59	0089_PW335_240529	✓	✓
EP2407422-009	29-May-2024 10:59	0089_SW130_240529	✓	✓

Proactive Holding Time Report

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

Requested Deliverables

[redacted]
- A4 - AU Tax Invoice (INV) — Email — [redacted]cardno.com.au

DERP LAB REPORTS
- EDI Format - ESDAT (ESDAT) — Email — derp.labreports@esdat.com.au

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

CERTIFICATE OF ANALYSIS

Work Order	: **EP2407422**	Page	: 1 of 9
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: [redacted]
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: +61-8-9406 1301
Project	: WA_0089_PFASOMP_24	Date Samples Received	: 30-May-2024 12:15
Order number	: pfas-omp/Stirling	Date Analysis Commenced	: 31-May-2024
C-O-C number	: 68334	Issue Date	: 11-Jun-2024 20:45
Sampler	: [redacted] [redacted]		
Site	: Stirling SW/PW - JS		
Quote number	: SY/139/19 B		
No. of samples received	: 9		
No. of samples analysed	: 9		

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]	Inorganics Supervisor	Perth Inorganics, Wangara, WA
[redacted]	Laboratory Manager (Perth)	Perth Inorganics, Wangara, WA
[redacted]	Senior Organic Chemist	Perth Organics, Wangara, WA

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.
- As per QWI – EN55-3 Data Interpreting Procedures, Ionic balances are typically calculated using Major Anions - Chloride, Alkalinity and Sulfate; and Major Cations - Calcium, Magnesium, Potassium and Sodium. Where applicable and dependent upon sample matrix, the Ionic Balance may also include the additional contribution of Ammonia, Dissolved Metals by ICPMS and H+ to the Cations and Nitrate, SiO2 and Fluoride to the Anions.
- Sodium Adsorption Ratio (where reported): Where results for Na, Ca or Mg are <LOR, a concentration at half the reported LOR is incorporated into the SAR calculation. This represents a conservative approach for Na relative to the assumption that <LOR = zero concentration and a conservative approach for Ca & Mg relative to the assumption that <LOR is equivalent to the LOR concentration.
- 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.
- ED045G: The presence of Thiocyanate, Thiosulfate and Sulfite can positively contribute to the chloride result, thereby may bias results higher than expected. Results should be scrutinised accordingly.

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_PW363_240529	0089_SW134_240529	0089_PW341_240529	0089_PW362_240529	0089_PW364_240529
				Sampling date / time	29-May-2024 10:14	29-May-2024 10:15	29-May-2024 10:16	29-May-2024 10:32	29-May-2024 10:44
Compound	CAS Number	LOR	Unit		EP2407422-001	EP2407422-002	EP2407422-003	EP2407422-004	EP2407422-005
					Result	Result	Result	Result	Result
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	<1	<1	<1	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	<1	<1	<1	<1
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		**144**	**124**	**166**	**186**	**178**
Total Alkalinity as CaCO3	----	1	mg/L		**144**	**124**	**166**	**186**	**178**
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		**2300**	**2420**	**2370**	**2420**	**2460**
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		**20200**	**21600**	**20800**	**21100**	**21200**
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		**428**	**446**	**454**	**463**	**432**
Magnesium	7439-95-4	1	mg/L		**1340**	**1450**	**1370**	**1420**	**1370**
Sodium	7440-23-5	1	mg/L		**10800**	**11800**	**11200**	**11500**	**11200**
Potassium	7440-09-7	1	mg/L		**402**	**431**	**407**	**419**	**404**
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		**620**	**662**	**639**	**649**	**653**
ø Total Cations	----	0.01	meq/L		**612**	**666**	**633**	**651**	**632**
ø Ionic Balance	----	0.01	%		**0.72**	**0.28**	**0.50**	**0.12**	**1.63**
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		**0.03**	<0.01	<0.01	<0.01	**0.02**
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_PW363_240529	0089_SW134_240529	0089_PW341_240529	0089_PW362_240529	0089_PW364_240529
				Sampling date / time	29-May-2024 10:14	29-May-2024 10:15	29-May-2024 10:16	29-May-2024 10:32	29-May-2024 10:44
Compound	CAS Number	LOR	Unit		EP2407422-001	EP2407422-002	EP2407422-003	EP2407422-004	EP2407422-005
					Result	Result	Result	Result	Result
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
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									

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_PW363_240529	0089_SW134_240529	0089_PW341_240529	0089_PW362_240529	0089_PW364_240529
				Sampling date / time	29-May-2024 10:14	29-May-2024 10:15	29-May-2024 10:16	29-May-2024 10:32	29-May-2024 10:44
Compound	CAS Number	LOR	Unit		EP2407422-001	EP2407422-002	EP2407422-003	EP2407422-004	EP2407422-005
					Result	Result	Result	Result	Result
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
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		**0.03**	<0.01	<0.01	<0.01	**0.02**
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		**0.03**	<0.01	<0.01	<0.01	**0.02**
Sum of PFAS (WA DER List)	----	0.01	µg/L		**0.03**	<0.01	<0.01	<0.01	**0.02**
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**106**	**98.8**	**99.8**	**100**	**104**
13C8-PFOA	----	0.02	%		**82.1**	**83.0**	**87.4**	**91.1**	**90.8**

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_SW132_240529	0089_PW340_240529	0089_PW335_240529	0089_SW130_240529	----
				Sampling date / time	29-May-2024 10:48	29-May-2024 10:54	29-May-2024 10:59	29-May-2024 10:59	----
Compound	CAS Number	LOR	Unit		EP2407422-006	EP2407422-007	EP2407422-008	EP2407422-009	--------
					Result	Result	Result	Result	----
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	<1	<1	<1	----
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	<1	<1	<1	----
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		166	164	131	123	----
Total Alkalinity as CaCO3	----	1	mg/L		166	164	131	123	----
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		2440	2610	2690	2630	----
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		16900	18300	16700	17100	----
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		412	416	440	446	----
Magnesium	7439-95-4	1	mg/L		1290	1270	1390	1410	----
Sodium	7440-23-5	1	mg/L		10600	9530	10500	10700	----
Potassium	7440-09-7	1	mg/L		392	518	577	584	----
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		531	574	530	540	----
ø Total Cations	----	0.01	meq/L		598	553	608	619	----
ø Ionic Balance	----	0.01	%		5.93	1.84	6.87	6.83	----
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		<0.01	<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	----
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		<0.01	0.04	<0.01	<0.01	----
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0089_SW132_240529	0089_PW340_240529	0089_PW335_240529	0089_SW130_240529	----
				Sampling date / time	29-May-2024 10:48	29-May-2024 10:54	29-May-2024 10:59	29-May-2024 10:59	----
Compound	CAS Number	LOR	Unit		EP2407422-006	EP2407422-007	EP2407422-008	EP2407422-009	--------
					Result	Result	Result	Result	----
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		<0.02	<0.02	<0.02	<0.02	----
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
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	----
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									

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)			Sample ID	0089_SW132_240529	0089_PW340_240529	0089_PW335_240529	0089_SW130_240529	----
			Sampling date / time	29-May-2024 10:48	29-May-2024 10:54	29-May-2024 10:59	29-May-2024 10:59	----
Compound	CAS Number	LOR	Unit	EP2407422-006	EP2407422-007	EP2407422-008	EP2407422-009	--------
				Result	Result	Result	Result	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued								
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	<0.01	**0.04**	<0.01	<0.01	----
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	<0.01	**0.04**	<0.01	<0.01	----
Sum of PFAS (WA DER List)	----	0.01	µg/L	<0.01	**0.04**	<0.01	<0.01	----
EP231S: PFAS Surrogate								
13C4-PFOS	----	0.02	%	**111**	**105**	**100**	**103**	----
13C8-PFOA	----	0.02	%	**88.9**	**91.4**	**88.0**	**82.7**	----

Surrogate Control Limits

Sub-Matrix: SURFACE WATER		Recovery Limits (%)	
Compound	CAS Number	Low	High
EP231S: PFAS Surrogate			
13C4-PFOS	----	65	140
13C8-PFOA	----	71	133

QUALITY CONTROL REPORT

Work Order	: **EP2407422**	Page	: 1 of 10
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: [redacted]
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: +61-8-9406 1301
Project	: WA_0089_PFASOMP_24	Date Samples Received	: 30-May-2024
Order number	: pfas-omp/Stirling	Date Analysis Commenced	: 31-May-2024
C-O-C number	: 68334	Issue Date	: 11-Jun-2024
Sampler	: [redacted] [redacted]		
Site	: Stirling SW/PW - JS		
Quote number	: SY/139/19 B		
No. of samples received	: 9		
No. of samples analysed	: 9		

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]	Inorganics Supervisor	Perth Inorganics, Wangara, WA
[redacted]	Laboratory Manager (Perth)	Perth Inorganics, Wangara, WA
[redacted]	Senior Organic Chemist	Perth Organics, Wangara, WA

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 (%)
ED037P: Alkalinity by PC Titrator (QC Lot: 5837685)									
EP2407418-005	Anonymous	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	533	536	0.5	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	533	536	0.5	0% - 20%
EP2407420-003	Anonymous	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	124	124	0.0	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	124	124	0.0	0% - 20%
ED037P: Alkalinity by PC Titrator (QC Lot: 5837691)									
EP2407422-007	0089_PW340_240529	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	164	164	0.0	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	164	164	0.0	0% - 20%
EP2407683-022	Anonymous	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	278	280	0.6	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	278	280	0.6	0% - 20%
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QC Lot: 5829570)									
EP2407418-005	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	45	45	0.0	0% - 20%
EP2407420-004	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	1980	1920	3.0	0% - 20%
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QC Lot: 5834964)									
EP2407422-006	0089_SW132_240529	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	2440	2380	2.4	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 (%)*
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QC Lot: 5834964) - continued									
EP2407422-009	0089_SW130_240529	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	2630	2660	0.9	0% - 20%
ED045G: Chloride by Discrete Analyser (QC Lot: 5829571)									
EP2407418-005	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	273	268	2.1	0% - 20%
EP2407420-004	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	16200	16000	1.3	0% - 20%
ED045G: Chloride by Discrete Analyser (QC Lot: 5834965)									
EP2407422-006	0089_SW132_240529	ED045G: Chloride	16887-00-6	1	mg/L	16900	16700	1.0	0% - 20%
EP2407422-009	0089_SW130_240529	ED045G: Chloride	16887-00-6	1	mg/L	17100	18600	8.4	0% - 20%
ED093F: Dissolved Major Cations (QC Lot: 5833501)									
EP2407420-001	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	432	445	3.0	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	1310	1360	3.4	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	11000	11300	2.5	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	404	413	2.2	0% - 20%
EP2407422-003	0089_PW341_240529	ED093F: Calcium	7440-70-2	1	mg/L	454	445	2.0	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	1370	1350	1.9	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	11200	11200	0.3	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	407	403	0.9	0% - 20%
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 5835304)									
EP2407418-012	Anonymous	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
EP2407418-014	Anonymous	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
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 5835304)									
EP2407418-012	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

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: 5835304) - continued									
EP2407418-012	Anonymous	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
EP2407418-014	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: 5835304)									
EP2407418-012	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
EP2407418-014	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

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: 5835304) - continued									
EP2407418-014	Anonymous	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: 5835304)									
EP2407418-012	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
EP2407418-014	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: 5835304)									
EP2407418-012	Anonymous	EP231X: Sum of PFAS	----	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	<0.01	<0.01	0.0	No Limit
EP2407418-014	Anonymous	EP231X: Sum of PFAS	----	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	<0.01	<0.01	0.0	No Limit

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
ED037P: Alkalinity by PC Titrator (QCLot: 5837685)								
ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	----	----	----	----
ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	----	----	----	----
ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	<1	----	----	----	----
ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	<1	20 mg/L	99.6	85.1	126
				<1	200 mg/L	101	90.5	111
ED037P: Alkalinity by PC Titrator (QCLot: 5837691)								
ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	----	----	----	----
ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	----	----	----	----
ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	<1	----	----	----	----
ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	<1	20 mg/L	100.0	85.1	126
				<1	200 mg/L	99.8	90.5	111
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 5829570)								
ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<1	25 mg/L	99.1	89.9	112
				<1	500 mg/L	93.8	89.9	112
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 5834964)								
ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<1	25 mg/L	98.8	89.9	112
				<1	500 mg/L	99.2	89.9	112
ED045G: Chloride by Discrete Analyser (QCLot: 5829571)								
ED045G: Chloride	16887-00-6	1	mg/L	<1	10 mg/L	97.2	88.6	113
				<1	1000 mg/L	106	88.6	113
ED045G: Chloride by Discrete Analyser (QCLot: 5834965)								
ED045G: Chloride	16887-00-6	1	mg/L	<1	10 mg/L	100	88.6	113
				<1	1000 mg/L	98.3	88.6	113
ED093F: Dissolved Major Cations (QCLot: 5833501)								
ED093F: Calcium	7440-70-2	1	mg/L	<1	50 mg/L	104	86.5	117
ED093F: Magnesium	7439-95-4	1	mg/L	<1	50 mg/L	104	88.4	110
ED093F: Sodium	7440-23-5	1	mg/L	<1	50 mg/L	103	91.4	113
ED093F: Potassium	7440-09-7	1	mg/L	<1	50 mg/L	104	84.6	108
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5835284)								

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
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5835284) - continued								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.2218 µg/L	95.1	72.0	130
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.2352 µg/L	100	71.0	127
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	0.2373 µg/L	95.9	68.0	131
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.238 µg/L	107	69.0	134
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.232 µg/L	95.0	65.0	140
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.241 µg/L	92.9	53.0	142
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5835304)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.2218 µg/L	92.6	72.0	130
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.2352 µg/L	98.8	71.0	127
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	0.2373 µg/L	94.6	68.0	131
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.238 µg/L	97.3	69.0	134
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.232 µg/L	85.1	65.0	140
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.241 µg/L	93.8	53.0	142
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5835284)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	1.25 µg/L	112	73.0	129
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	0.25 µg/L	81.8	72.0	129
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	0.25 µg/L	116	72.0	129
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	0.25 µg/L	103	72.0	130
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	0.25 µg/L	104	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	89.8	71.0	129
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	0.25 µg/L	87.6	69.0	133
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	0.25 µg/L	98.8	72.0	134
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	0.25 µg/L	90.6	65.0	144
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	0.25 µg/L	106	71.0	132
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5835304)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	1.25 µg/L	105	73.0	129
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	0.25 µg/L	84.6	72.0	129
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	0.25 µg/L	112	72.0	129
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	0.25 µg/L	102	72.0	130
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	0.25 µg/L	109	71.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	0.25 µg/L	92.2	69.0	130
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	0.25 µg/L	94.8	71.0	129
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	0.25 µg/L	82.0	69.0	133

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: 5835304) - continued								
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	0.25 µg/L	101	72.0	134
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	0.25 µg/L	136	65.0	144
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	0.25 µg/L	102	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5835284)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.25 µg/L	90.6	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	0.625 µg/L	111	68.0	141
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	0.625 µg/L	69.8	60.5	138
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	0.625 µg/L	109	68.3	134
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	0.625 µg/L	105	62.2	138
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	0.25 µg/L	106	65.0	136
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	0.25 µg/L	123	61.0	135
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5835304)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.25 µg/L	92.6	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	0.625 µg/L	108	68.0	141
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	0.625 µg/L	94.3	60.5	138
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	0.625 µg/L	104	68.3	134
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	0.625 µg/L	106	62.2	138
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	0.25 µg/L	88.2	65.0	136
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	0.25 µg/L	97.6	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5835284)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.2343 µg/L	109	63.0	143
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	0.2378 µg/L	106	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	0.24 µg/L	99.4	67.0	138
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	0.241 µg/L	94.0	64.2	133
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5835304)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.2343 µg/L	103	63.0	143
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	0.2378 µg/L	108	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	0.24 µg/L	102	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: 5835304) - continued								
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	0.241 µg/L	88.4	64.2	133
EP231P: PFAS Sums (QCLot: 5835284)								
EP231X: Sum of PFAS	----	0.01	µg/L	<0.01	----	----	----	----
EP231X: Sum of PFHxS and PFOS	355-46-4/17 63-23-1	0.01	µg/L	<0.01	----	----	----	----
EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	<0.01	----	----	----	----
EP231P: PFAS Sums (QCLot: 5835304)								
EP231X: Sum of PFAS	----	0.01	µg/L	<0.01	----	----	----	----
EP231X: Sum of PFHxS and PFOS	355-46-4/17 63-23-1	0.01	µg/L	<0.01	----	----	----	----
EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	<0.01	----	----	----	----

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
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 5829570)							
EP2407418-005	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	100 mg/L	107	70.4	130
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 5834964)							
EP2407422-006	0089_SW132_240529	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	100 mg/L	# Not Determined	70.4	130
ED045G: Chloride by Discrete Analyser (QCLot: 5829571)							
EP2407418-005	Anonymous	ED045G: Chloride	16887-00-6	200 mg/L	110	70.0	130
ED045G: Chloride by Discrete Analyser (QCLot: 5834965)							
EP2407422-006	0089_SW132_240529	ED045G: Chloride	16887-00-6	200 mg/L	# Not Determined	70.0	130
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5835304)							
EP2407418-013	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.2218 µg/L	98.3	72.0	129
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.232 µg/L	108	71.0	127
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.2352 µg/L	102	68.0	129
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.238 µg/L	106	69.0	134
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.232 µg/L	91.4	65.0	140
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.241 µg/L	82.1	53.0	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: 5835304)							
EP2407418-013	Anonymous	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	1.25 µg/L	111	73.0	142
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.25 µg/L	78.6	72.0	129
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.25 µg/L	115	72.0	129
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.25 µg/L	106	72.0	130
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.25 µg/L	111	71.0	133
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.25 µg/L	96.8	69.0	130
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.25 µg/L	102	71.0	134
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.25 µg/L	98.4	69.0	133
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.25 µg/L	104	72.0	134
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.25 µg/L	115	65.0	144
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.25 µg/L	105	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5835304)							
EP2407418-013	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.25 µg/L	92.6	59.0	135
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.625 µg/L	90.7	70.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.625 µg/L	74.2	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.625 µg/L	114	70.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.625 µg/L	109	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.25 µg/L	99.8	65.0	136
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.25 µg/L	129	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5835304)							
EP2407418-013	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.234 µg/L	110	63.0	143
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.2378 µg/L	114	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.24 µg/L	114	67.0	138
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.2415 µg/L	83.0	70.0	130

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **EP2407422**	Page	: 1 of 6
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Telephone	: +61-8-9406 1301
Project	: WA_0089_PFASOMP_24	Date Samples Received	: 30-May-2024
Site	: Stirling SW/PW - JS	Issue Date	: 11-Jun-2024
Sampler	: [redacted]	No. of samples received	: 9
Order number	: pfas-omp/Stirling	No. of samples analysed	: 9

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.**
- **Matrix Spike outliers exist - please see following pages for full details.**
- **For all regular sample matrices, where applicable to the methodology, 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 : Quality Control Samples

Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

Matrix: **WATER**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
Matrix Spike (MS) Recoveries							
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA	EP2407422--006	0089_SW132_240529	**Sulfate as SO4 - Turbidimetric**	14808-79-8	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
ED045G: Chloride by Discrete Analyser	EP2407422--006	0089_SW132_240529	**Chloride**	16887-00-6	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**

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	2	27	7.41	10.00	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)						
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	27	3.70	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*			*Analysis*		
		Date extracted	*Due for extraction*	*Evaluation*	*Date analysed*	*Due for analysis*	*Evaluation*
ED037P: Alkalinity by PC Titrator							
Clear Plastic Bottle - Natural (ED037-P) 0089_PW363_240529, 0089_SW134_240529, 0089_PW341_240529, 0089_PW362_240529	**29-May-2024**	**----**	----	**----**	**05-Jun-2024**	12-Jun-2024	✓
Clear Plastic Bottle - Natural (ED037-P) 0089_PW364_240529, 0089_SW132_240529, 0089_PW340_240529, 0089_PW335_240529, 0089_SW130_240529	**29-May-2024**	**----**	----	**----**	**06-Jun-2024**	12-Jun-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
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA							
Clear Plastic Bottle - Natural (ED041G)							
0089_PW363_240529, 0089_SW134_240529, 0089_PW341_240529, 0089_PW362_240529, 0089_PW364_240529, 0089_SW132_240529, 0089_PW340_240529, 0089_PW335_240529, 0089_SW130_240529	**29-May-2024**	**----**	----	**----**	**11-Jun-2024**	26-Jun-2024	✓
ED045G: Chloride by Discrete Analyser							
Clear Plastic Bottle - Natural (ED045G)							
0089_PW363_240529, 0089_SW134_240529, 0089_PW341_240529, 0089_PW362_240529, 0089_PW364_240529, 0089_SW132_240529, 0089_PW340_240529, 0089_PW335_240529, 0089_SW130_240529	**29-May-2024**	**----**	----	**----**	**11-Jun-2024**	26-Jun-2024	✓
ED093F: Dissolved Major Cations							
Clear Plastic Bottle - Natural (ED093F)							
0089_PW363_240529, 0089_SW134_240529, 0089_PW341_240529, 0089_PW362_240529, 0089_PW364_240529, 0089_SW132_240529, 0089_PW340_240529, 0089_PW335_240529, 0089_SW130_240529	**29-May-2024**	**----**	----	**----**	**04-Jun-2024**	05-Jun-2024	✓
EP231A: Perfluoroalkyl Sulfonic Acids							
HDPE (no PTFE) (EP231X)							
0089_PW363_240529, 0089_SW134_240529, 0089_PW341_240529, 0089_PW362_240529, 0089_PW364_240529, 0089_SW132_240529, 0089_PW340_240529, 0089_PW335_240529, 0089_SW130_240529	**29-May-2024**	**07-Jun-2024**	25-Nov-2024	✓	**07-Jun-2024**	25-Nov-2024	✓
EP231B: Perfluoroalkyl Carboxylic Acids							
HDPE (no PTFE) (EP231X)							
0089_PW363_240529, 0089_SW134_240529, 0089_PW341_240529, 0089_PW362_240529, 0089_PW364_240529, 0089_SW132_240529, 0089_PW340_240529, 0089_PW335_240529, 0089_SW130_240529	**29-May-2024**	**07-Jun-2024**	25-Nov-2024	✓	**07-Jun-2024**	25-Nov-2024	✓
EP231C: Perfluoroalkyl Sulfonamides							
HDPE (no PTFE) (EP231X)							
0089_PW363_240529, 0089_SW134_240529, 0089_PW341_240529, 0089_PW362_240529, 0089_PW364_240529, 0089_SW132_240529, 0089_PW340_240529, 0089_PW335_240529, 0089_SW130_240529	**29-May-2024**	**07-Jun-2024**	25-Nov-2024	✓	**07-Jun-2024**	25-Nov-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)							
0089_PW363_240529, 0089_SW134_240529, 0089_PW341_240529, 0089_PW362_240529, 0089_PW364_240529, 0089_SW132_240529, 0089_PW340_240529, 0089_PW335_240529, 0089_SW130_240529	**29-May-2024**	**07-Jun-2024**	25-Nov-2024	✓	**07-Jun-2024**	25-Nov-2024	✓
EP231P: PFAS Sums							
HDPE (no PTFE) (EP231X)							
0089_PW363_240529, 0089_SW134_240529, 0089_PW341_240529, 0089_PW362_240529, 0089_PW364_240529, 0089_SW132_240529, 0089_PW340_240529, 0089_PW335_240529, 0089_SW130_240529	**29-May-2024**	**07-Jun-2024**	25-Nov-2024	✓	**07-Jun-2024**	25-Nov-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)							
Alkalinity by Auto Titrator	ED037-P	4	39	**10.26**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	4	40	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	27	**7.41**	**10.00**	×	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	4	33	**12.12**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Alkalinity by Auto Titrator	ED037-P	4	39	**10.26**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	4	40	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	27	**7.41**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	4	33	**12.12**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Alkalinity by Auto Titrator	ED037-P	2	39	**5.13**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	40	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	27	**7.41**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	33	**6.06**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Chloride by Discrete Analyser	ED045G	2	40	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	27	**3.70**	**5.00**	×	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	33	**6.06**	**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
Alkalinity by Auto Titrator	ED037-P	WATER	In house: Referenced to APHA 2320 B This procedure determines alkalinity by automated measurement (e.g. PC Titrate) on a settled supernatant aliquot of the sample using pH 4.5 for indicating the total alkalinity end-point. This method is compliant with NEPM Schedule B(3)
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	WATER	In house: Referenced to APHA 4500-SO4. Dissolved sulfate is determined in a 0.45um filtered sample. Sulfate ions are converted to a barium sulfate suspension in an acetic acid medium with barium chloride. Light absorbance of the BaSO4 suspension is measured by a photometer and the SO4-2 concentration is determined by comparison of the reading with a standard curve. This method is compliant with NEPM Schedule B(3)
Chloride by Discrete Analyser	ED045G	WATER	In house: Referenced to APHA 4500 Cl - G.The thiocyanate ion is liberated from mercuric thiocyanate through sequestration of mercury by the chloride ion to form non-ionised mercuric chloride. In the presence of ferric ions the liberated thiocynate forms highly-coloured ferric thiocynate which is measured at 480 nm.
Major Cations - Dissolved	ED093F	WATER	In house: Referenced to APHA 3120 and 3125; USEPA SW 846 - 6010 and 6020; Cations are determined by either ICP-AES or ICP-MS techniques. This method is compliant with NEPM Schedule B(3) Sodium Adsorption Ratio is calculated from Ca, Mg and Na which determined by ALS in house method QWI-EN/ED093F. This method is compliant with NEPM Schedule B(3) Hardness parameters are calculated based on APHA 2340 B. This method is compliant with NEPM Schedule B(3)
Ionic Balance by PCT DA and Turbi SO4 DA	* EN055 - PG	WATER	In house: Referenced to APHA 1030F. This method is compliant with NEPM Schedule B(3)
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.

ALSCompass
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Environmental Division
Perth
Work Order Reference
EP2407423

Telephone : +61-8-9406 1301

Custody Document for Submissions via ALS Compass App

Project: WA-0089-PPASODP-24 Client: STANTEC Project Manager: [redacted]

Phone: [redacted]

ALS Compass COC Reference: 68323 68318 68334 68335 68326 68324 # Samples: 68325 Sampler: [redacted]

Phone: [redacted]

Turnaround Requirements: Standard ✓ Urgent

Special Instructions:

Custody:

Relinquished by: STANTEC	Received by: [redacted]	Relinquished by:	Received by:
Date / Time: 29/5/24	Date / Time: 30/5 1215	Date / Time:	Date / Time:

CHAIN OF CUSTODY

ALS COC#: 68335 ALS Laboratory: EP Perth Environmental

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

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP_24

SITE: Stirling SD - JS

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted] derp.labreports@esdat.com.au

EMAIL INVOICES 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 Sediments SEDIMENT	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
001	0089_SD363		29/05/2024 10:20 AM	SOIL	ALS: 1 Non ALS: 0	No	X		
002	0089_SD341		29/05/2024 10:21 AM	SOIL	ALS: 1 Non ALS: 0	No	X		
003	0089_SD362		29/05/2024 10:33 AM	SOIL	ALS: 1 Non ALS: 0	No	X		
004	0089_SD364		29/05/2024 10:34 AM	SOIL	ALS: 1 Non ALS: 0	No	X		
005	0089_SD340		29/05/2024 10:35 AM	SOIL	ALS: 1 Non ALS: 0	No	X		
006	0089_SD335		29/05/2024 12:05 PM	SOIL	ALS: 1 Non ALS: 0	No	X		

Wednesday, May 29, 2024 7:55:05 AM

CHAIN OF CUSTODY

COC#: 68335 ALS Laboratory: EP Perth Environmental

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP_24

SITE: Stirling SD - JS

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted] derp.labreports@esdat.com.au

EMAIL INVOICES TO: [redacted]

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

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	0089_SD363	HDPE Soil Jar	200 mL	00621122049153	Grey	No	
002	0089_SD341	HDPE Soil Jar	200 mL	00621122049158	Grey	No	
003	0089_SD362	HDPE Soil Jar	200 mL	00621122003388	Grey	No	
004	0089_SD364	HDPE Soil Jar	200 mL	00621122027847	Grey	No	
005	0089_SD340	HDPE Soil Jar	200 mL	00621122027942	Grey	No	
006	0089_SD335	HDPE Soil Jar	200 mL	00621122049035	Grey	No	

Total Bottle Count: ALS: 6, Non ALS: 0

SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : **EP2407423**

Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: [redacted]
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
E-mail	: [redacted]stantec.com	E-mail	: [redacted]alsglobal.com
Telephone	: ----	Telephone	: +61-8-9406 1301
Facsimile	: ----	Facsimile	: +61-8-9406 1399
Project	: WA_0089_PFASOMP_24	Page	: 1 of 2
Order number	: pfas-omp/Stirling	Quote number	: ES2022MWHAUS0002 (SY/139/19 B)
C-O-C number	: 68335	QC Level	: NEPM 2013 B3 & ALS QC Standard
Site	: Stirling SD - JS		
Sampler	: [redacted]		

Dates

Date Samples Received	: 30-May-2024 12:15	Issue Date	: 31-May-2024
Client Requested Due Date	: 11-Jun-2024	Scheduled Reporting Date	: **11-Jun-2024**

Delivery Details

Mode of Delivery	: Carrier	Security Seal	: Not Available
No. of coolers/boxes	: 2	Temperature	: 16.7 - Ice present
Receipt Detail	:	No. of samples received / analysed	: 6 / 6

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 see scanned COC for sample discrepencies: extra samples , samples not received etc.
- Please direct any queries related to sample condition / numbering / breakages to Sample Receipt (Samples.Perth@alsglobal.com)
- Analytical work for this work order will be conducted at ALS Environmental Perth.
- Please direct any turnaround / technical queries to the laboratory contact designated above.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months) from receipt of samples.
- **pH analysis should be conducted within 6 hours of sampling.**
- **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.**
- 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: **SOIL**

Laboratory sample ID	Sampling date / time	Sample ID	SOIL - EA055-103 Moisture Content	SOIL - EP231X (solids) PFAS - Full Suite (30 analytes)
EP2407423-001	29-May-2024 10:20	0089_SD363_240529	✓	✓
EP2407423-002	29-May-2024 10:21	0089_SD341_240529	✓	✓
EP2407423-003	29-May-2024 10:33	0089_SD362_240529	✓	✓
EP2407423-004	29-May-2024 10:34	0089_SD364_240529	✓	✓
EP2407423-005	29-May-2024 10:35	0089_SD340_240529	✓	✓
EP2407423-006	29-May-2024 12:05	0089_SD335_240529	✓	✓

Proactive Holding Time Report

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

Requested Deliverables

[redacted]
- A4 - AU Tax Invoice (INV) — Email — [redacted]cardno.com.au

DERP LAB REPORTS
- EDI Format - ESDAT (ESDAT) — Email — derp.labreports@esdat.com.au

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

CERTIFICATE OF ANALYSIS

Work Order	: **EP2407423**	Page	: 1 of 7
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: [redacted]
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: +61-8-9406 1301
Project	: WA_0089_PFASOMP_24	Date Samples Received	: 30-May-2024 12:15
Order number	: pfas-omp/Stirling	Date Analysis Commenced	: 04-Jun-2024
C-O-C number	: 68335	Issue Date	: 10-Jun-2024 16:33
Sampler	: [redacted]		
Site	: Stirling SD - JS		
Quote number	: SY/139/19 B		
No. of samples received	: 6		
No. of samples analysed	: 6		

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]	Laboratory Manager (Perth)	Perth Inorganics, Wangara, WA
[redacted]	Senior Organic Chemist	Perth Organics, Wangara, WA

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.

- 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 USEPA 1633 limits 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: SEDIMENT (Matrix: SOIL)				Sample ID	0089_SD363_240529	0089_SD341_240529	0089_SD362_240529	0089_SD364_240529	0089_SD340_240529
				Sampling date / time	29-May-2024 10:20	29-May-2024 10:21	29-May-2024 10:33	29-May-2024 10:34	29-May-2024 10:35
Compound	CAS Number	LOR	Unit		EP2407423-001	EP2407423-002	EP2407423-003	EP2407423-004	EP2407423-005
					Result	Result	Result	Result	Result
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content	----	0.1	%		**25.8**	**27.9**	**28.6**	**27.8**	**25.6**
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg		<0.001	<0.001	<0.001	<0.001	<0.001
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002

Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)				Sample ID	0089_SD363_240529	0089_SD341_240529	0089_SD362_240529	0089_SD364_240529	0089_SD340_240529
				Sampling date / time	29-May-2024 10:20	29-May-2024 10:21	29-May-2024 10:33	29-May-2024 10:34	29-May-2024 10:35
Compound	CAS Number	LOR	Unit		EP2407423-001	EP2407423-002	EP2407423-003	EP2407423-004	EP2407423-005
					Result	Result	Result	Result	Result
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
EP231P: PFAS Sums									
Sum of PFAS	----	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Sum of PFAS (WA DER List)	----	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.0002	%		**118**	**114**	**113**	**112**	**108**
13C8-PFOA	----	0.0002	%		**79.0**	**90.5**	**90.0**	**85.0**	**91.5**

Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)				Sample ID	0089_SD335_240529	----	----	----	----
				Sampling date / time	29-May-2024 12:05	----	----	----	----
Compound	CAS Number	LOR	Unit		EP2407423-006	--------	--------	--------	--------
					Result	----	----	----	----
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content	----	0.1	%		**29.1**	----	----	----	----
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg		<0.0002	----	----	----	----
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg		<0.0002	----	----	----	----
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg		<0.0002	----	----	----	----
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg		<0.0002	----	----	----	----
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg		<0.0002	----	----	----	----
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg		<0.0002	----	----	----	----
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg		<0.001	----	----	----	----
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg		<0.0002	----	----	----	----
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg		<0.0002	----	----	----	----
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg		<0.0002	----	----	----	----
Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg		<0.0002	----	----	----	----
Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg		<0.0002	----	----	----	----
Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg		<0.0002	----	----	----	----
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg		<0.0002	----	----	----	----
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg		<0.0002	----	----	----	----
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg		<0.0002	----	----	----	----
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg		<0.0005	----	----	----	----
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg		<0.0002	----	----	----	----

Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)				Sample ID	0089_SD335_240529	----	----	----	----
				Sampling date / time	29-May-2024 12:05	----	----	----	----
Compound	CAS Number	LOR	Unit		EP2407423-006	--------	--------	--------	--------
					Result	----	----	----	----
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg		<0.0005	----	----	----	----
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg		<0.0005	----	----	----	----
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg		<0.0005	----	----	----	----
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg		<0.0005	----	----	----	----
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg		<0.0002	----	----	----	----
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg		<0.0002	----	----	----	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg		<0.0005	----	----	----	----
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg		<0.0005	----	----	----	----
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg		<0.0005	----	----	----	----
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg		<0.0005	----	----	----	----
EP231P: PFAS Sums									
Sum of PFAS	----	0.0002	mg/kg		<0.0002	----	----	----	----
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg		<0.0002	----	----	----	----
Sum of PFAS (WA DER List)	----	0.0002	mg/kg		<0.0002	----	----	----	----
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.0002	%		**116**	----	----	----	----
13C8-PFOA	----	0.0002	%		**97.5**	----	----	----	----

Surrogate Control Limits

Sub-Matrix: **SEDIMENT**		Recovery Limits (%)	
Compound	*CAS Number*	*Low*	*High*
EP231S: PFAS Surrogate			
13C4-PFOS	----	76	136
13C8-PFOA	----	78	131

QUALITY CONTROL REPORT

Work Order	: **EP2407423**	Page	: 1 of 7
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: [redacted]
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: +61-8-9406 1301
Project	: WA_0089_PFASOMP_24	Date Samples Received	: 30-May-2024
Order number	: pfas-omp/Stirling	Date Analysis Commenced	: 04-Jun-2024
C-O-C number	: 68335	Issue Date	: 10-Jun-2024
Sampler	: [redacted] [redacted]		
Site	: Stirling SD - JS		
Quote number	: SY/139/19 B		
No. of samples received	: 6		
No. of samples analysed	: 6		

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]	Laboratory Manager (Perth)	Perth Inorganics, Wangara, WA
[redacted]	Senior Organic Chemist	Perth Organics, Wangara, WA

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: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
EA055: Moisture Content (Dried @ 105-110°C) (QC Lot: 5839269)									
EP2407423-001	0089_SD363_240529	EA055: Moisture Content	----	0.1	%	25.8	26.2	1.5	0% - 20%
EP2407633-007	Anonymous	EA055: Moisture Content	----	0.1	%	18.9	17.4	8.3	0% - 20%
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 5834313)									
EP2407423-001	0089_SD363_240529	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
EP2407506-030	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 5834313)									
EP2407423-001	0089_SD363_240529	EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit

Sub-Matrix: **SOIL**

				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: 5834313) - continued									
EP2407423-001	0089_SD363_240529	EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	<0.001	0.0	No Limit
EP2407506-030	Anonymous	EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	<0.001	0.0	No Limit
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 5834313)									
EP2407423-001	0089_SD363_240529	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
EP2407506-030	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit

Sub-Matrix: **SOIL**

				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: 5834313) - continued									
EP2407506-030	Anonymous	EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 5834313)									
EP2407423-001	0089_SD363_240529	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
EP2407506-030	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
EP231P: PFAS Sums (QC Lot: 5834313)									
EP2407423-001	0089_SD363_240529	EP231X: Sum of PFAS	----	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Sum of PFAS (WA DER List)	----	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
EP2407506-030	Anonymous	EP231X: Sum of PFAS	----	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Sum of PFAS (WA DER List)	----	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit

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: **SOIL**

				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: 5834313)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	0.0011 mg/kg	80.9	72.0	128
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	0.00125 mg/kg	80.0	73.0	123
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	0.00118 mg/kg	79.2	67.0	130
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	0.00119 mg/kg	89.9	70.0	132
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	0.00116 mg/kg	78.0	68.0	136
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	0.0012 mg/kg	80.0	59.0	134
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5834313)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	0.00625 mg/kg	92.2	71.0	135
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	0.00125 mg/kg	76.8	69.0	132
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	0.00125 mg/kg	96.4	70.0	132
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	0.00125 mg/kg	88.0	71.0	131
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	104	69.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	95.6	72.0	129
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	0.00125 mg/kg	75.2	69.0	133
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	68.8	64.0	136
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	78.8	69.0	135
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	85.2	66.0	139
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	0.00125 mg/kg	89.6	69.0	133
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5834313)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	0.00125 mg/kg	82.0	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	0.00312 mg/kg	83.6	59.6	143
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	0.00312 mg/kg	71.6	62.8	140
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	0.00312 mg/kg	93.6	61.5	139
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	0.00312 mg/kg	83.3	61.9	139
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	0.00125 mg/kg	82.0	63.0	144
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	0.00125 mg/kg	75.6	61.0	139
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5834313)								

Sub-Matrix: **SOIL**

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: 5834313) - continued								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	0.00117 mg/kg	92.3	62.0	145
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	0.00118 mg/kg	89.4	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	0.0012 mg/kg	97.5	65.0	137
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	0.0012 mg/kg	82.1	54.8	124
EP231P: PFAS Sums (QCLot: 5834313)								
EP231X: Sum of PFAS	----	0.0002	mg/kg	<0.0002	----	----	----	----
EP231X: Sum of PFHxS and PFOS	355-46-4/17 63-23-1	0.0002	mg/kg	<0.0002	----	----	----	----
EP231X: Sum of PFAS (WA DER List)	----	0.0002	mg/kg	<0.0002	----	----	----	----

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: **SOIL**

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: 5834313)							
EP2407423-002	0089_SD341_240529	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0011 mg/kg	84.1	72.0	128
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.00117 mg/kg	91.0	73.0	123
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.00118 mg/kg	83.9	67.0	130
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.00119 mg/kg	90.3	70.0	132
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.00116 mg/kg	79.3	68.0	136
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0012 mg/kg	81.7	59.0	134
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5834313)							
EP2407423-002	0089_SD341_240529	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.00625 mg/kg	87.0	71.0	135
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.00125 mg/kg	79.5	69.0	132
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.00125 mg/kg	97.1	70.0	132
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.00125 mg/kg	90.0	71.0	131
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.00125 mg/kg	94.4	69.0	133
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.00125 mg/kg	92.1	72.0	129
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.00125 mg/kg	80.0	69.0	133
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.00125 mg/kg	78.6	64.0	136
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.00125 mg/kg	74.3	69.0	135
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.00125 mg/kg	90.7	66.0	139
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.00125 mg/kg	86.4	69.0	133
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5834313)							

Sub-Matrix: **SOIL**

				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: 5834313) - continued							
EP2407423-002	0089_SD341_240529	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.00125 mg/kg	79.2	48.0	128
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.00312 mg/kg	97.3	60.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.00312 mg/kg	92.4	60.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.00312 mg/kg	94.2	60.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.00312 mg/kg	89.9	60.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.00125 mg/kg	89.5	63.0	144
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.00125 mg/kg	80.8	61.0	139
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5834313)							
EP2407423-002	0089_SD341_240529	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.00117 mg/kg	94.4	62.0	145
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.00118 mg/kg	90.7	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0012 mg/kg	94.5	65.0	137
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0012 mg/kg	77.2	60.0	130

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **EP2407423**	Page	: 1 of 4
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Telephone	: +61-8-9406 1301
Project	: WA_0089_PFASOMP_24	Date Samples Received	: 30-May-2024
Site	: Stirling SD - JS	Issue Date	: 10-Jun-2024
Sampler	: [redacted] [redacted]	No. of samples received	: 6
Order number	: pfas-omp/Stirling	No. of samples analysed	: 6

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, where applicable to the methodology, 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: **SOIL**

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
EA055: Moisture Content (Dried @ 105-110°C)							
HDPE Soil Jar (EA055)							
0089_SD363_240529, 0089_SD341_240529, 0089_SD362_240529, 0089_SD364_240529, 0089_SD340_240529, 0089_SD335_240529	**29-May-2024**	**----**	----	----	**06-Jun-2024**	12-Jun-2024	✓
EP231A: Perfluoroalkyl Sulfonic Acids							
HDPE Soil Jar (EP231X)							
0089_SD363_240529, 0089_SD341_240529, 0089_SD362_240529, 0089_SD364_240529, 0089_SD340_240529, 0089_SD335_240529	**29-May-2024**	**04-Jun-2024**	25-Nov-2024	✓	**04-Jun-2024**	14-Jul-2024	✓
EP231B: Perfluoroalkyl Carboxylic Acids							
HDPE Soil Jar (EP231X)							
0089_SD363_240529, 0089_SD341_240529, 0089_SD362_240529, 0089_SD364_240529, 0089_SD340_240529, 0089_SD335_240529	**29-May-2024**	**04-Jun-2024**	25-Nov-2024	✓	**04-Jun-2024**	14-Jul-2024	✓
EP231C: Perfluoroalkyl Sulfonamides							
HDPE Soil Jar (EP231X)							
0089_SD363_240529, 0089_SD341_240529, 0089_SD362_240529, 0089_SD364_240529, 0089_SD340_240529, 0089_SD335_240529	**29-May-2024**	**04-Jun-2024**	25-Nov-2024	✓	**04-Jun-2024**	14-Jul-2024	✓
EP231D: (n:2) Fluorotelomer Sulfonic Acids							
HDPE Soil Jar (EP231X)							
0089_SD363_240529, 0089_SD341_240529, 0089_SD362_240529, 0089_SD364_240529, 0089_SD340_240529, 0089_SD335_240529	**29-May-2024**	**04-Jun-2024**	25-Nov-2024	✓	**04-Jun-2024**	14-Jul-2024	✓
EP231P: PFAS Sums							
HDPE Soil Jar (EP231X)							
0089_SD363_240529, 0089_SD341_240529, 0089_SD362_240529, 0089_SD364_240529, 0089_SD340_240529, 0089_SD335_240529	**29-May-2024**	**04-Jun-2024**	25-Nov-2024	✓	**04-Jun-2024**	14-Jul-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: **SOIL**

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)							
Moisture Content	EA055	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	17	**11.76**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	17	**5.88**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	17	**5.88**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	17	**5.88**	**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
Moisture Content	EA055	SOIL	In house: A gravimetric procedure based on weight loss over a 12 hour drying period at 105-110 degrees C. This method is compliant with NEPM Schedule B(3).
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	SOIL	In-house: Analysis of soils by solvent extraction followed by LC-Electrospray-MS-MS, Negative Mode using MRM using internal standard quantitation. Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to a portion of soil which is then extracted with MTBE and an ion pairing reagent. A portion of extract is exchanged into the analytical solvent mixture, combined with an equal volume reagent water and 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
QuECheRS Extraction of Solids	* ORG71	SOIL	In house: Sequential extractions with Acetonitrile/Methanol by shaking. Extraction efficiency aided by the addition of salts under acidic conditions. Where relevant, interferences from co-extracted organics are removed with dispersive clean-up media (dSPE). The extract is either diluted or concentrated and exchanged into the analytical solvent.

ALSCompass
SAMPLING *Intelligence*

ALS

Environmental Division
Perth
Work Order Reference
EP2407455

Telephone : +61-8-9406 1301

Custody Document for Submissions via ALS Compass App

Project: WA_0089_PPASDP_24 Client: STANTEC Project Manager: [redacted]

Phone: ( )

ALS Compass COC Reference: 68323 68318 68334 68335 68326 68324 # Samples: 68325 Sampler: [redacted]

Phone: ( )

Turnaround Requirements: Standard ____ Urgent ____

Special Instructions:

Custody:

Relinquished by:	Received by:	Relinquished by:	Received by:
STANTEC	[redacted]		
Date / Time: 29/5/24	Date / Time: 30/5 1215	Date / Time:	Date / Time:

CHAIN OF CUSTODY

COC#: 68324 ALS Laboratory: EP Perth Environmental

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

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP_24

SITE: Stirling GW - CG

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted] derp.labreports@esdat.com.au

EMAIL INVOICES 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	Rinsate WATER	WA OMP Water Suite WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
001	0089_MW199		29/05/2024 08:25 AM	WATER	ALS: 3 Non ALS: 0	No		X		
002	0089_MW468		29/05/2024 08:26 AM	WATER	ALS: 3 Non ALS: 0	No		X		
003	0089_MW200		29/05/2024 08:26 AM	WATER	ALS: 3 Non ALS: 0	No		X		
004	0089_MW202		29/05/2024 10:06 AM	WATER	ALS: 3 Non ALS: 0	No		X		
005	0089_MW203		29/05/2024 11:22 AM	WATER	ALS: 3 Non ALS: 0	No		X		
006	0089_MW233		29/05/2024 11:52 AM	WATER	ALS: 3 Non ALS: 0	No		X		
007	0089_MW289		29/05/2024 12:10 PM	WATER	ALS: 3 Non ALS: 0	No		X		

CHAIN OF CUSTODY

ALS COC#: 68324 *ALS Laboratory:* EP Perth Environmental

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP_24

SITE: Stirling GW - CG

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted] derp.labreports@esdat.com.au

EMAIL INVOICES TO: [redacted]

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

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	Rinsate WATER	WA OMP Water Suite WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
008	0089_QC302		29/05/2024 12:40 PM	WATER	ALS: 0 Non ALS: 2	No	X			
009	0089_QC402		29/05/2024 12:40 PM	WATER	ALS: 0 Non ALS: 2	No	X			

CHAIN OF CUSTODY

ALS COC#: 68324 ALS Laboratory: EP Perth Environmental

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0089_PFASOMP_24

SITE: Stirling GW - CG

ORDER NO: pfas-omp/Stirling

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: [redacted] SAMPLER MOBILE: [redacted]

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: [redacted] derp.labreports@esdat.com.au

EMAIL INVOICES TO: [redacted]

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

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	0089_MW199	HDPE (no PTFE)	20 mL	00352312048761	Grey	No	
001	0089_MW199	HDPE (no PTFE)	20 mL	00352312048489	Grey	No	
001	0089_MW199	Clear Plastic Bottle - Natural	125 mL	00070821217698	Green	No	
002	0089_MW468	Clear Plastic Bottle - Natural	125 mL	00070821217856	Green	No	
002	0089_MW468	HDPE (no PTFE)	20 mL	00352312048777	Grey	No	
002	0089_MW468	HDPE (no PTFE)	20 mL	00352312048602	Grey	No	
003	0089_MW200	HDPE (no PTFE)	20 mL	00351221024746	Grey	No	
003	0089_MW200	HDPE (no PTFE)	20 mL	00352312048563	Grey	No	
003	0089_MW200	Clear Plastic Bottle - Natural	125 mL	00070821217676	Green	No	
004	0089_MW202	HDPE (no PTFE)	20 mL	00351221024673	Grey	No	
004	0089_MW202	Clear Plastic Bottle - Natural	125 mL	00070821217635	Green	No	
004	0089_MW202	HDPE (no PTFE)	20 mL	00352312048724	Grey	No	
005	0089_MW203	Clear Plastic Bottle - Natural	125 mL	00070821217686	Green	No	
005	0089_MW203	HDPE (no PTFE)	20 mL	00352312048717	Grey	No	
005	0089_MW203	HDPE (no PTFE)	20 mL	00351221024726	Grey	No	
006	0089_MW233	HDPE (no PTFE)	20 mL	00352312048565	Grey	No	
006	0089_MW233	HDPE (no PTFE)	20 mL	00352312048516	Grey	No	
006	0089_MW233	Clear Plastic Bottle - Natural	125 mL	00070821217732	Green	No	
007	0089_MW289	HDPE (no PTFE)	20 mL	00352312048575	Grey	No	
007	0089_MW289	HDPE (no PTFE)	20 mL	00352312048524	Grey	No	
007	0089_MW289	Clear Plastic Bottle - Natural	125 mL	00070821217714	Green	No	

Total Bottle Count: ALS: 21, Non ALS: 4

SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : **EP2407455**

Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: [redacted]
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
E-mail	: [redacted]stantec.com	E-mail	: [redacted]alsglobal.com
Telephone	: ----	Telephone	: +61-8-9406 1301
Facsimile	: ----	Facsimile	: +61-8-9406 1399
Project	: WA_0089_PFASOMP_24	Page	: 1 of 2
Order number	: pfas-omp/Stirling	Quote number	: ES2022MWHAUS0002 (SY/139/19 B)
C-O-C number	: 68324	QC Level	: NEPM 2013 B3 & ALS QC Standard
Site	: Stirling GW - CG		
Sampler	: [redacted]		

Dates

Date Samples Received	: 30-May-2024 12:15	Issue Date	: 31-May-2024
Client Requested Due Date	: 11-Jun-2024	Scheduled Reporting Date	: **11-Jun-2024**

Delivery Details

Mode of Delivery	: Carrier	Security Seal	: Not Available
No. of coolers/boxes	: 2	Temperature	: 16.7 - Ice present
Receipt Detail	:	No. of samples received / analysed	: 9 / 9

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 see scanned COC for sample discrepencies: extra samples , samples not received etc.
- Please direct any queries related to sample condition / numbering / breakages to Sample Receipt (Samples.Perth@alsglobal.com)
- Analytical work for this work order will be conducted at ALS Environmental Perth.
- Please direct any turnaround / technical queries to the laboratory contact designated above.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months) from receipt of samples.
- **pH analysis should be conducted within 6 hours of sampling.**
- **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.**
- 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 (30 analytes)	WATER - NT-01 & 02 Ca, Mg, Na, K, Cl, SO4, Alkalinity
EP2407455-001	29-May-2024 08:25	0089_MW199_240529	✓	✓
EP2407455-002	29-May-2024 08:26	0089_MW468_240529	✓	✓
EP2407455-003	29-May-2024 08:26	0089_MW200_240529	✓	✓
EP2407455-004	29-May-2024 10:06	0089_MW202_240529	✓	✓
EP2407455-005	29-May-2024 11:22	0089_MW203_240529	✓	✓
EP2407455-006	29-May-2024 11:52	0089_MW233_240529	✓	✓
EP2407455-007	29-May-2024 12:10	0089_MW289_240529	✓	✓
EP2407455-008	29-May-2024 12:40	0089_QC302_240529	✓	
EP2407455-009	29-May-2024 12:40	0089_QC402_240529	✓	

Proactive Holding Time Report

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

Requested Deliverables

[redacted]
- A4 - AU Tax Invoice (INV) — Email — [redacted]cardno.com.au

DERP LAB REPORTS
- EDI Format - ESDAT (ESDAT) — Email — derp.labreports@esdat.com.au

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

CERTIFICATE OF ANALYSIS

Work Order	: **EP2407455**	Page	: 1 of 11
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: [redacted]
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: +61-8-9406 1301
Project	: WA_0089_PFASOMP_24	Date Samples Received	: 30-May-2024 12:15
Order number	: pfas-omp/Stirling	Date Analysis Commenced	: 31-May-2024
C-O-C number	: 68324	Issue Date	: 11-Jun-2024 20:41
Sampler	: [redacted] [redacted]		
Site	: Stirling GW - CG		
Quote number	: SY/139/19 B		
No. of samples received	: 9		
No. of samples analysed	: 9		

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]	Laboratory Manager (Perth)	Perth Inorganics, Wangara, WA
[redacted]	Senior Organic Chemist	Perth Organics, Wangara, WA

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.
- As per QWI – EN55-3 Data Interpreting Procedures, Ionic balances are typically calculated using Major Anions - Chloride, Alkalinity and Sulfate; and Major Cations - Calcium, Magnesium, Potassium and Sodium. Where applicable and dependent upon sample matrix, the Ionic Balance may also include the additional contribution of Ammonia, Dissolved Metals by ICPMS and H+ to the Cations and Nitrate, SiO2 and Fluoride to the Anions.
- Sodium Adsorption Ratio (where reported): Where results for Na, Ca or Mg are <LOR, a concentration at half the reported LOR is incorporated into the SAR calculation. This represents a conservative approach for Na relative to the assumption that <LOR = zero concentration and a conservative approach for Ca & Mg relative to the assumption that <LOR is equivalent to the LOR concentration.
- 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.
- ED045G: The presence of Thiocyanate, Thiosulfate and Sulfite can positively contribute to the chloride result, thereby may bias results higher than expected. Results should be scrutinised accordingly.

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW199_240529	0089_MW468_240529	0089_MW200_240529	0089_MW202_240529	0089_MW203_240529
				Sampling date / time	29-May-2024 08:25	29-May-2024 08:26	29-May-2024 08:26	29-May-2024 10:06	29-May-2024 11:22
Compound	CAS Number	LOR	Unit		EP2407455-001	EP2407455-002	EP2407455-003	EP2407455-004	EP2407455-005
					Result	Result	Result	Result	Result
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	<1	<1	<1	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	<1	<1	<1	<1
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		**946**	**626**	**448**	**368**	**319**
Total Alkalinity as CaCO3	----	1	mg/L		**946**	**626**	**448**	**368**	**319**
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		**492**	**771**	**260**	**64**	**58**
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		**4360**	**6230**	**2370**	**211**	**84**
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		**270**	**308**	**130**	**109**	**84**
Magnesium	7439-95-4	1	mg/L		**344**	**542**	**147**	**30**	**42**
Sodium	7440-23-5	1	mg/L		**2710**	**4100**	**1750**	**207**	**74**
Potassium	7440-09-7	1	mg/L		**116**	**152**	**63**	**8**	**4**
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		**152**	**204**	**81.2**	**14.6**	**9.95**
ø Total Cations	----	0.01	meq/L		**163**	**242**	**96.3**	**17.1**	**11.0**
ø Ionic Balance	----	0.01	%		**3.33**	**8.49**	**8.50**	**7.81**	**4.87**
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	**0.05**
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**	<0.01	<0.01	**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

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW199_240529	0089_MW468_240529	0089_MW200_240529	0089_MW202_240529	0089_MW203_240529
				Sampling date / time	29-May-2024 08:25	29-May-2024 08:26	29-May-2024 08:26	29-May-2024 10:06	29-May-2024 11:22
Compound	CAS Number	LOR	Unit		EP2407455-001	EP2407455-002	EP2407455-003	EP2407455-004	EP2407455-005
					Result	Result	Result	Result	Result
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
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									

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW199_240529	0089_MW468_240529	0089_MW200_240529	0089_MW202_240529	0089_MW203_240529
				Sampling date / time	29-May-2024 08:25	29-May-2024 08:26	29-May-2024 08:26	29-May-2024 10:06	29-May-2024 11:22
Compound	CAS Number	LOR	Unit		EP2407455-001	EP2407455-002	EP2407455-003	EP2407455-004	EP2407455-005
					Result	Result	Result	Result	Result
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
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**	<0.01	<0.01	**0.02**	**0.05**
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		**0.02**	<0.01	<0.01	**0.02**	**0.05**
Sum of PFAS (WA DER List)	----	0.01	µg/L		**0.02**	<0.01	<0.01	**0.02**	**0.05**
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**103**	**104**	**109**	**106**	**106**
13C8-PFOA	----	0.02	%		**81.1**	**89.0**	**76.9**	**81.9**	**83.3**

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW233_240529	0089_MW289_240529	----	----	----
				Sampling date / time	29-May-2024 11:52	29-May-2024 12:10	----	----	----
Compound	CAS Number	LOR	Unit		EP2407455-006	EP2407455-007	--------	--------	--------
					Result	Result	----	----	----
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	<1	----	----	----
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	<1	----	----	----
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		**104**	**523**	----	----	----
Total Alkalinity as CaCO3	----	1	mg/L		**104**	**523**	----	----	----
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		**6**	**78**	----	----	----
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		**15**	**84**	----	----	----
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		**38**	**109**	----	----	----
Magnesium	7439-95-4	1	mg/L		**6**	**34**	----	----	----
Sodium	7440-23-5	1	mg/L		**15**	**86**	----	----	----
Potassium	7440-09-7	1	mg/L		**2**	**6**	----	----	----
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		**2.62**	**14.4**	----	----	----
ø Total Cations	----	0.01	meq/L		**3.09**	**12.1**	----	----	----
ø Ionic Balance	----	0.01	%		**8.18**	**8.70**	----	----	----
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		<0.02	**0.03**	----	----	----
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		<0.02	**0.04**	----	----	----
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		**0.01**	**0.51**	----	----	----
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		<0.02	**0.03**	----	----	----
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		**0.03**	**0.94**	----	----	----
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	<0.02	----	----	----

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW233_240529	0089_MW289_240529	----	----	----
				Sampling date / time	29-May-2024 11:52	29-May-2024 12:10	----	----	----
Compound	CAS Number	LOR	Unit		EP2407455-006	EP2407455-007	--------	--------	--------
					Result	Result	----	----	----
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		<0.1	<0.1	----	----	----
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		<0.02	**0.05**	----	----	----
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		<0.01	**0.03**	----	----	----
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		<0.05	<0.05	----	----	----
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L		<0.02	<0.02	----	----	----
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L		<0.05	<0.05	----	----	----
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L		<0.05	<0.05	----	----	----
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L		<0.05	<0.05	----	----	----
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L		<0.05	<0.05	----	----	----
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L		<0.02	<0.02	----	----	----
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L		<0.02	<0.02	----	----	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids									

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0089_MW233_240529	0089_MW289_240529	----	----	----
				Sampling date / time	29-May-2024 11:52	29-May-2024 12:10	----	----	----
Compound	CAS Number	LOR	Unit		EP2407455-006	EP2407455-007	--------	--------	--------
					Result	Result	----	----	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L		<0.05	<0.05	----	----	----
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		<0.05	<0.05	----	----	----
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		<0.05	<0.05	----	----	----
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L		<0.05	<0.05	----	----	----
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L		**0.04**	**1.63**	----	----	----
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		**0.04**	**1.45**	----	----	----
Sum of PFAS (WA DER List)	----	0.01	µg/L		**0.04**	**1.56**	----	----	----
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**102**	**110**	----	----	----
13C8-PFOA	----	0.02	%		**84.5**	**86.8**	----	----	----

Analytical Results

Sub-Matrix: RINSATE (Matrix: WATER)				Sample ID	0089_QC302_240529	0089_QC402_240529	----	----	----
				Sampling date / time	29-May-2024 12:40	29-May-2024 12:40	----	----	----
Compound	CAS Number	LOR	Unit		EP2407455-008	EP2407455-009	--------	--------	--------
					Result	Result	----	----	----
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		<0.01	<0.01	----	----	----
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		<0.01	<0.01	----	----	----
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	<0.02	----	----	----
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		<0.1	<0.1	----	----	----
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		<0.01	<0.01	----	----	----
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		<0.05	<0.05	----	----	----
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L		<0.02	<0.02	----	----	----
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L		<0.05	<0.05	----	----	----

Analytical Results

Sub-Matrix: RINSATE (Matrix: WATER)				Sample ID	0089_QC302_240529	0089_QC402_240529	----	----	----
				Sampling date / time	29-May-2024 12:40	29-May-2024 12:40	----	----	----
Compound	CAS Number	LOR	Unit		EP2407455-008	EP2407455-009	--------	--------	--------
					Result	Result	----	----	----
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L		<0.05	<0.05	----	----	----
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L		<0.05	<0.05	----	----	----
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L		<0.05	<0.05	----	----	----
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L		<0.02	<0.02	----	----	----
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L		<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	----	----	----
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		<0.05	<0.05	----	----	----
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		<0.05	<0.05	----	----	----
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L		<0.05	<0.05	----	----	----
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L		<0.01	<0.01	----	----	----
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		<0.01	<0.01	----	----	----
Sum of PFAS (WA DER List)	----	0.01	µg/L		<0.01	<0.01	----	----	----
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**104**	**104**	----	----	----
13C8-PFOA	----	0.02	%		**91.4**	**87.4**	----	----	----

Surrogate Control Limits

Sub-Matrix: **GROUNDWATER**		Recovery Limits (%)	
Compound	*CAS Number*	**Low**	**High**
EP231S: PFAS Surrogate			
13C4-PFOS	----	65	140
13C8-PFOA	----	71	133

Sub-Matrix: **RINSATE**		Recovery Limits (%)	
Compound	*CAS Number*	**Low**	**High**
EP231S: PFAS Surrogate			
13C4-PFOS	----	65	140
13C8-PFOA	----	71	133

QUALITY CONTROL REPORT

Work Order	: **EP2407455**	Page	: 1 of 12
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: [redacted]
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: +61-8-9406 1301
Project	: WA_0089_PFASOMP_24	Date Samples Received	: 30-May-2024
Order number	: pfas-omp/Stirling	Date Analysis Commenced	: 31-May-2024
C-O-C number	: 68324	Issue Date	: 11-Jun-2024
Sampler	: [redacted] [redacted]		
Site	: Stirling GW - CG		
Quote number	: SY/139/19 B		
No. of samples received	: 9		
No. of samples analysed	: 9		

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]	Laboratory Manager (Perth)	Perth Inorganics, Wangara, WA
[redacted]	Senior Organic Chemist	Perth Organics, Wangara, WA

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 (%)
ED037P: Alkalinity by PC Titrator (QC Lot: 5837691)									
EP2407422-007	Anonymous	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	164	164	0.0	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	164	164	0.0	0% - 20%
EP2407683-022	Anonymous	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	278	280	0.6	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	278	280	0.6	0% - 20%
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QC Lot: 5830375)									
EP2407455-001	0089_MW199_240529	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	492	512	4.0	0% - 20%
EP2407554-004	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	22	21	0.0	0% - 20%
ED045G: Chloride by Discrete Analyser (QC Lot: 5830376)									
EP2407455-001	0089_MW199_240529	ED045G: Chloride	16887-00-6	1	mg/L	4360	4050	7.6	0% - 20%
EP2407554-004	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	49	51	3.4	0% - 20%
ED093F: Dissolved Major Cations (QC Lot: 5833502)									
EP2407452-004	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	27	27	0.0	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	15	15	0.0	0% - 50%
		ED093F: Sodium	7440-23-5	1	mg/L	79	82	3.4	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	7	8	0.0	No Limit
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 5835304)									
EP2407418-012	Anonymous	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

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: 5835304) - continued									
EP2407418-012	Anonymous	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
EP2407418-014	Anonymous	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: 5835306)									
EP2407455-008	0089_QC302_240529	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
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 5835304)									
EP2407418-012	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
EP2407418-014	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

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: 5835304) - continued									
EP2407418-014	Anonymous	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: 5835306)									
EP2407455-008	0089_QC302_240529	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: 5835304)									
EP2407418-012	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
EP2407418-014	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

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: 5835304) - continued									
EP2407418-014	Anonymous	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: 5835306)									
EP2407455-008	0089_QC302_240529	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: 5835304)									
EP2407418-012	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
EP2407418-014	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
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 5835306)									
EP2407455-008	0089_QC302_240529	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: 5835306) - continued									
EP2407455-008	0089_QC302_240529	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: 5835304)									
EP2407418-012	Anonymous	EP231X: Sum of PFAS	----	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	<0.01	<0.01	0.0	No Limit
EP2407418-014	Anonymous	EP231X: Sum of PFAS	----	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	<0.01	<0.01	0.0	No Limit
EP231P: PFAS Sums (QC Lot: 5835306)									
EP2407455-008	0089_QC302_240529	EP231X: Sum of PFAS	----	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	<0.01	<0.01	0.0	No Limit

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
ED037P: Alkalinity by PC Titrator (QCLot: 5837691)								
ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	----	----	----	----
ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	----	----	----	----
ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	<1	----	----	----	----
ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	<1	20 mg/L	100.0	85.1	126
				<1	200 mg/L	99.8	90.5	111
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 5830375)								
ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<1	25 mg/L	104	89.9	112
				<1	500 mg/L	98.8	89.9	112
ED045G: Chloride by Discrete Analyser (QCLot: 5830376)								
ED045G: Chloride	16887-00-6	1	mg/L	<1	10 mg/L	100	88.6	113
				<1	1000 mg/L	102	88.6	113
ED093F: Dissolved Major Cations (QCLot: 5833502)								
ED093F: Calcium	7440-70-2	1	mg/L	<1	50 mg/L	108	86.5	117
ED093F: Magnesium	7439-95-4	1	mg/L	<1	50 mg/L	106	88.4	110
ED093F: Sodium	7440-23-5	1	mg/L	<1	50 mg/L	106	91.4	113
ED093F: Potassium	7440-09-7	1	mg/L	<1	50 mg/L	103	84.6	108
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5835304)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.2218 µg/L	92.6	72.0	130
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.2352 µg/L	98.8	71.0	127
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	0.2373 µg/L	94.6	68.0	131
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.238 µg/L	97.3	69.0	134
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.232 µg/L	85.1	65.0	140
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.241 µg/L	93.8	53.0	142
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5835306)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.2218 µg/L	92.2	72.0	130
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.2352 µg/L	106	71.0	127
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	0.2373 µg/L	99.2	68.0	131
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.238 µg/L	106	69.0	134
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.232 µg/L	93.8	65.0	140
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.241 µg/L	89.2	53.0	142

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: 5835304)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	1.25 µg/L	105	73.0	129
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	0.25 µg/L	84.6	72.0	129
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	0.25 µg/L	112	72.0	129
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	0.25 µg/L	102	72.0	130
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	0.25 µg/L	109	71.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	0.25 µg/L	92.2	69.0	130
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	0.25 µg/L	94.8	71.0	129
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	0.25 µg/L	82.0	69.0	133
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	0.25 µg/L	101	72.0	134
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	0.25 µg/L	136	65.0	144
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	0.25 µg/L	102	71.0	132
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5835306)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	1.25 µg/L	101	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	110	72.0	129
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	0.25 µg/L	98.6	72.0	130
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	0.25 µg/L	99.2	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	88.8	71.0	129
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	0.25 µg/L	83.8	69.0	133
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	0.25 µg/L	94.2	72.0	134
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	0.25 µg/L	85.6	65.0	144
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	0.25 µg/L	99.0	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5835304)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.25 µg/L	92.6	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	0.625 µg/L	108	68.0	141
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	0.625 µg/L	94.3	60.5	138
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	0.625 µg/L	104	68.3	134
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	0.625 µg/L	106	62.2	138
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	0.25 µg/L	88.2	65.0	136
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	0.25 µg/L	97.6	61.0	135

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
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5835306)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.25 µg/L	89.4	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	0.625 µg/L	102	68.0	141
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	0.625 µg/L	97.0	60.5	138
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	0.625 µg/L	101	68.3	134
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	0.625 µg/L	103	62.2	138
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	0.25 µg/L	99.6	65.0	136
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	0.25 µg/L	102	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5835304)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.2343 µg/L	103	63.0	143
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	0.2378 µg/L	108	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	0.24 µg/L	102	67.0	138
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	0.241 µg/L	88.4	64.2	133
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5835306)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.2343 µg/L	111	63.0	143
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	0.2378 µg/L	107	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	0.24 µg/L	116	67.0	138
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	0.241 µg/L	102	64.2	133
EP231P: PFAS Sums (QCLot: 5835304)								
EP231X: Sum of PFAS	----	0.01	µg/L	<0.01	----	----	----	----
EP231X: Sum of PFHxS and PFOS	355-46-4/17 63-23-1	0.01	µg/L	<0.01	----	----	----	----
EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	<0.01	----	----	----	----
EP231P: PFAS Sums (QCLot: 5835306)								
EP231X: Sum of PFAS	----	0.01	µg/L	<0.01	----	----	----	----
EP231X: Sum of PFHxS and PFOS	355-46-4/17 63-23-1	0.01	µg/L	<0.01	----	----	----	----
EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	<0.01	----	----	----	----

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**

Matrix Spike (MS) Report

Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 5830375)							
EP2407455-001	0089_MW199_240529	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	100 mg/L	# Not Determined	70.4	130
ED045G: Chloride by Discrete Analyser (QCLot: 5830376)							
EP2407455-001	0089_MW199_240529	ED045G: Chloride	16887-00-6	200 mg/L	# Not Determined	70.0	130
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5835304)							
EP2407418-013	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.2218 µg/L	98.3	72.0	129
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.232 µg/L	108	71.0	127
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.2352 µg/L	102	68.0	129
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.238 µg/L	106	69.0	134
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.232 µg/L	91.4	65.0	140
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.241 µg/L	82.1	53.0	129
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5835306)							
EP2407455-009	0089_QC402_240529	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.2218 µg/L	90.4	72.0	129
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.232 µg/L	106	71.0	127
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.2352 µg/L	96.5	68.0	129
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.238 µg/L	105	69.0	134
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.232 µg/L	89.0	65.0	140
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.241 µg/L	84.8	53.0	129
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5835304)							
EP2407418-013	Anonymous	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	1.25 µg/L	111	73.0	142
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.25 µg/L	78.6	72.0	129
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.25 µg/L	115	72.0	129
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.25 µg/L	106	72.0	130
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.25 µg/L	111	71.0	133
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.25 µg/L	96.8	69.0	130
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.25 µg/L	102	71.0	134
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.25 µg/L	98.4	69.0	133
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.25 µg/L	104	72.0	134
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.25 µg/L	115	65.0	144
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.25 µg/L	105	71.0	132
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5835306)							
EP2407455-009	0089_QC402_240529	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	1.25 µg/L	98.4	73.0	142
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.25 µg/L	99.2	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	102	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	110	69.0	130

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: 5835306) - continued							
EP2407455-009	0089_QC402_240529	EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.25 µg/L	89.8	71.0	134
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.25 µg/L	96.6	69.0	133
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.25 µg/L	92.6	72.0	134
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.25 µg/L	71.8	65.0	144
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.25 µg/L	101	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5835304)							
EP2407418-013	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.25 µg/L	92.6	59.0	135
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.625 µg/L	90.7	70.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.625 µg/L	74.2	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.625 µg/L	114	70.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.625 µg/L	109	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.25 µg/L	99.8	65.0	136
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.25 µg/L	129	61.0	135
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5835306)							
EP2407455-009	0089_QC402_240529	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.25 µg/L	89.8	59.0	135
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.625 µg/L	103	70.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.625 µg/L	101	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.625 µg/L	101	70.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.625 µg/L	114	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.25 µg/L	108	65.0	136
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.25 µg/L	135	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5835304)							
EP2407418-013	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.234 µg/L	110	63.0	143
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.2378 µg/L	114	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.24 µg/L	114	67.0	138
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.2415 µg/L	83.0	70.0	130
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5835306)							
EP2407455-009	0089_QC402_240529	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.234 µg/L	108	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: 5835306) - continued							
EP2407455-009	0089_QC402_240529	EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.2378 µg/L	103	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.24 µg/L	114	67.0	138
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.2415 µg/L	98.1	70.0	130

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **EP2407455**	Page	: 1 of 5
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Telephone	: +61-8-9406 1301
Project	: WA_0089_PFASOMP_24	Date Samples Received	: 30-May-2024
Site	: Stirling GW - CG	Issue Date	: 11-Jun-2024
Sampler	: [redacted] [redacted]	No. of samples received	: 9
Order number	: pfas-omp/Stirling	No. of samples analysed	: 9

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.**
- **Matrix Spike outliers exist - please see following pages for full details.**
- **For all regular sample matrices, where applicable to the methodology, 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.**

Outliers : Quality Control Samples

Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

Matrix: **WATER**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
Matrix Spike (MS) Recoveries							
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA	EP2407455--001	0089_MW199_240529	**Sulfate as SO4 - Turbidimetric**	14808-79-8	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
ED045G: Chloride by Discrete Analyser	EP2407455--001	0089_MW199_240529	**Chloride**	16887-00-6	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**

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
ED037P: Alkalinity by PC Titrator							
Clear Plastic Bottle - Natural (ED037-P)							
0089_MW199_240529, 0089_MW200_240529, 0089_MW203_240529, 0089_MW289_240529, 0089_MW468_240529, 0089_MW202_240529, 0089_MW233_240529,	**29-May-2024**	**----**	----	**----**	**06-Jun-2024**	12-Jun-2024	✓
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA							
Clear Plastic Bottle - Natural (ED041G)							
0089_MW199_240529, 0089_MW200_240529, 0089_MW203_240529, 0089_MW289_240529, 0089_MW468_240529, 0089_MW202_240529, 0089_MW233_240529,	**29-May-2024**	**----**	----	**----**	**10-Jun-2024**	26-Jun-2024	✓
ED045G: Chloride by Discrete Analyser							
Clear Plastic Bottle - Natural (ED045G)							
0089_MW199_240529, 0089_MW200_240529, 0089_MW203_240529, 0089_MW289_240529, 0089_MW468_240529, 0089_MW202_240529, 0089_MW233_240529,	**29-May-2024**	**----**	----	**----**	**10-Jun-2024**	26-Jun-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
ED093F: Dissolved Major Cations							
Clear Plastic Bottle - Natural (ED093F)							
0089_MW199_240529, 0089_MW200_240529, 0089_MW203_240529, 0089_MW289_240529, 0089_MW468_240529, 0089_MW202_240529, 0089_MW233_240529,	**29-May-2024**	**----**	----	**----**	**04-Jun-2024**	05-Jun-2024	✓
EP231A: Perfluoroalkyl Sulfonic Acids							
HDPE (no PTFE) (EP231X)							
0089_MW199_240529, 0089_MW200_240529, 0089_MW203_240529, 0089_MW289_240529, 0089_QC402_240529, 0089_MW468_240529, 0089_MW202_240529, 0089_MW233_240529, 0089_QC302_240529,	**29-May-2024**	**07-Jun-2024**	25-Nov-2024	✓	**07-Jun-2024**	25-Nov-2024	✓
EP231B: Perfluoroalkyl Carboxylic Acids							
HDPE (no PTFE) (EP231X)							
0089_MW199_240529, 0089_MW200_240529, 0089_MW203_240529, 0089_MW289_240529, 0089_QC402_240529, 0089_MW468_240529, 0089_MW202_240529, 0089_MW233_240529, 0089_QC302_240529,	**29-May-2024**	**07-Jun-2024**	25-Nov-2024	✓	**07-Jun-2024**	25-Nov-2024	✓
EP231C: Perfluoroalkyl Sulfonamides							
HDPE (no PTFE) (EP231X)							
0089_MW199_240529, 0089_MW200_240529, 0089_MW203_240529, 0089_MW289_240529, 0089_QC402_240529, 0089_MW468_240529, 0089_MW202_240529, 0089_MW233_240529, 0089_QC302_240529,	**29-May-2024**	**07-Jun-2024**	25-Nov-2024	✓	**07-Jun-2024**	25-Nov-2024	✓
EP231D: (n:2) Fluorotelomer Sulfonic Acids							
HDPE (no PTFE) (EP231X)							
0089_MW199_240529, 0089_MW200_240529, 0089_MW203_240529, 0089_MW289_240529, 0089_QC402_240529, 0089_MW468_240529, 0089_MW202_240529, 0089_MW233_240529, 0089_QC302_240529,	**29-May-2024**	**07-Jun-2024**	25-Nov-2024	✓	**07-Jun-2024**	25-Nov-2024	✓
EP231P: PFAS Sums							
HDPE (no PTFE) (EP231X)							
0089_MW199_240529, 0089_MW200_240529, 0089_MW203_240529, 0089_MW289_240529, 0089_QC402_240529, 0089_MW468_240529, 0089_MW202_240529, 0089_MW233_240529, 0089_QC302_240529,	**29-May-2024**	**07-Jun-2024**	25-Nov-2024	✓	**07-Jun-2024**	25-Nov-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)							
Alkalinity by Auto Titrator	ED037-P	2	19	**10.53**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	1	10	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	3	25	**12.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Alkalinity by Auto Titrator	ED037-P	2	19	**10.53**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	1	10	**10.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	25	**8.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Alkalinity by Auto Titrator	ED037-P	1	19	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	1	10	**10.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	25	**8.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Chloride by Discrete Analyser	ED045G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	25	**8.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	20	**5.00**	**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
Alkalinity by Auto Titrator	ED037-P	WATER	In house: Referenced to APHA 2320 B This procedure determines alkalinity by automated measurement (e.g. PC Titrate) on a settled supernatant aliquot of the sample using pH 4.5 for indicating the total alkalinity end-point. This method is compliant with NEPM Schedule B(3)
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	WATER	In house: Referenced to APHA 4500-SO4. Dissolved sulfate is determined in a 0.45um filtered sample. Sulfate ions are converted to a barium sulfate suspension in an acetic acid medium with barium chloride. Light absorbance of the BaSO4 suspension is measured by a photometer and the SO4-2 concentration is determined by comparison of the reading with a standard curve. This method is compliant with NEPM Schedule B(3)
Chloride by Discrete Analyser	ED045G	WATER	In house: Referenced to APHA 4500 Cl - G.The thiocyanate ion is liberated from mercuric thiocyanate through sequestration of mercury by the chloride ion to form non-ionised mercuric chloride. In the presence of ferric ions the liberated thiocynate forms highly-coloured ferric thiocynate which is measured at 480 nm.
Major Cations - Dissolved	ED093F	WATER	In house: Referenced to APHA 3120 and 3125; USEPA SW 846 - 6010 and 6020; Cations are determined by either ICP-AES or ICP-MS techniques. This method is compliant with NEPM Schedule B(3) Sodium Adsorption Ratio is calculated from Ca, Mg and Na which determined by ALS in house method QWI-EN/ED093F. This method is compliant with NEPM Schedule B(3) Hardness parameters are calculated based on APHA 2340 B. This method is compliant with NEPM Schedule B(3)
Ionic Balance by PCT DA and Turbi SO4 DA	* EN055 - PG	WATER	In house: Referenced to APHA 1030F. This method is compliant with NEPM Schedule B(3)
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.

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Email: enquiries.melb@mgtlabmark.com.au

CHAIN OF CUSTODY RECORD

CLIENT DETAILS

Company Name : Stantec Australia	Contact Nam[redacted]	Purchase Order : 304700525/730	COC Number : 304700525/730 -03
Office Address : GF, 226 Adelaide Terrace, Perth WA 6000		PROJECT Number : WA_0089_PFASOMP_24	Eurofins | mgt quote ID :
	Email for COC/SRN/Results : [redacted] derp.labreports@esdat.com.au	PROJECT Name : WA_0089_PFASOMP_24	Data output format: PDF; ESDAT

Special Directions & Comments :
Please send ESdat files to derp.labreports@esdat.com.au with the project No in the header file

Please send invoice to SAPinvoices@stantec.com

Eurofins | mgt DI water batch number:

	Sample ID	Date	Matrix	PFAS (28 analytes) standard LOR
1	0089_QC201_240527	27/05/2024	Water	X
2	0089_QC202_240527	27/05/2024	Water	X
3	0089_QC203_240527	27/05/2024	Water	X
4	0089_QC204_240527	27/05/2024	Water	X
5	0089_QC205_240527	27/05/2024	Water	X
6	0089_QC206_240528	28/05/2024	Water	X
7	0089_QC207_240528	28/05/2024	Soil	X
8	0089_QC208_240528	28/05/2024	Water	X
9	0089_QC209_240528	28/05/2024	Water	X
10	0089_QC210_240528	28/05/2024	Soil	X
11	0089_QC211_240528	28/05/2024	Water	X
12	0089_QC212_240528	28/05/2024	Water	X
13	0089_QC213_240528	28/05/2024	Water	X
14	0089_QC214_240528	28/05/2024	Water	X
15	0089_QC215_240528	28/05/2024	Water	X
16	0089_QC216_240528	28/05/2024	Water	X
17	0089_QC217_240528	28/05/2024	Soil	X
18	0089_QC218_240528	28/05/2024	Soil	X

Analytes

Some common holding times (with correct preservation).
For further information contact the lab

Waters		Soils	
BTEX, MAH, VOC	14 days	BTEX, MAH, VOC	14 days
TRH, PAH, Phenols, Pesticides	7 days	TRH, PAH, Phenols, Pesticides	14 days
Heavy Metals	6 months	Heavy Metals	6 months
Mercury, CrVI	28 days	Mercury, CrVI	28 days
Microbiological testing	24 hours	Microbiological testing	72 hours
BOD, Nitrate, Nitrite, Total N	2 days	Anions	28 days
Solids - TSS, TDS etc	7 days	SPOCAS, pH Field and FOX, CrS	24 hours
Ferrous iron	7 days	ASLP, TCLP	7 days

Containers:

1LP	250P	125P	1LA	40mL vial	125mL A	Jar		Sample comments:

Laboratory Staff

Relinquished By: Stantec Australia
Date & Time : 28/05/24
Signature:

Received By:
Date & Time : 13:35 29/05/24
Signature: [redacted] 9.9°C

Turn around time

1 DAY ☐ 2 DAY ☐ 3 DAY ☐
STANDARD ☑ Other:

Method Of Shipment

☑ Courier
☐ Hand Delivered
☐ Postal
Courier Consignment # :

Temperature on arrival:

Report number:

1102636

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Sample Receipt Advice

Company name:	Stantec Australia Pty Ltd (WA)
Contact name:	ALL INVOICES
Project name:	WA_0089_PFASOMP_24
Project ID:	WA_0089_PFASOMP_24
Turnaround time:	5 Day
Date/Time received	May 29, 2024 1:35 PM
Eurofins reference	1102636

Sample Information

✓	A detailed list of analytes logged into our LIMS, is included in the attached summary table.
✓	All samples have been received as described on the above COC.
✓	COC has been completed correctly.
✓	Attempt to chill was evident.
✓	Appropriately preserved sample containers have been used.
✓	All samples were received in good condition.
✓	Samples have been provided with adequate time to commence analysis in accordance with the relevant holding times.
✓	Appropriate sample containers have been used.
N/A	Sample containers for volatile analysis received with zero headspace.
X	Split sample sent to requested external lab.
X	Some samples have been subcontracted.
N/A	Custody Seals intact (if used).

Notes

Contact

If you have any questions with respect to these samples, please contact your Analytical Services Manager:

[redacted]

Results will be delivered electronically via email to ALL INVOICES - sapinvoices@stantec.com.

Note: A copy of these results will also be delivered to the general Stantec Australia Pty Ltd (WA) email address.

Global Leader - Results you can trust

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email: EnviroSales@eurofins.com

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Address: 6F 226,Adelaide Terrace
Perth
WA 6000

Project Name: WA_0089_PFASOMP_24
Project ID: WA_0089_PFASOMP_24

Order No.: 304700525/730
Report #: 1102636
Phone: 0458 839 200
Fax:

Received: May 29, 2024 1:35 PM
Due: Jun 6, 2024
Priority: 5 Day
Contact Name: ALL INVOICES

Eurofins Analytical Services Manager : [redacted]

Sample Detail						Moisture Set	Per- and Polyfluoroalkyl Substances (PFASs)
Perth Laboratory - NATA # 2377 Site # 2370						X	X
External Laboratory							
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**		
1	0089_QC201_240527	May 27, 2024		Water	L24-My0084305		X
2	0089_QC202_240527	May 27, 2024		Water	L24-My0084306		X
3	0089_QC203_240527	May 27, 2024		Water	L24-My0084307		X
4	0089_QC204_240527	May 27, 2024		Water	L24-My0084308		X
5	0089_QC205_240527	May 27, 2024		Water	L24-My0084309		X
6	0089_QC206_240528	May 28, 2024		Water	L24-My0084310		X
7	0089_QC207_240528	May 28, 2024		Soil	L24-My0084311	X	X
8	0089_QC208_240528	May 28, 2024		Water	L24-My0084312		X

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email: EnviroSales@eurofins.com

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Perth
WA 6000

Project Name: WA_0089_PFASOMP_24
Project ID: WA_0089_PFASOMP_24

Order No.: 304700525/730
Report #: 1102636
Phone: [redacted]
Fax:

Received: May 29, 2024 1:35 PM
Due: Jun 6, 2024
Priority: 5 Day
Contact Name: ALL INVOICES

Eurofins Analytical Services Manager : [redacted]

Sample Detail						Moisture Set	Per- and Polyfluoroalkyl Substances (PFASs)
Perth Laboratory - NATA # 2377 Site # 2370						X	X
External Laboratory							
9	0089_QC209_240528	May 28, 2024		Water	L24-My0084313		X
10	0089_QC210_240528	May 28, 2024		Soil	L24-My0084314	X	X
11	0089_QC211_240528	May 28, 2024		Water	L24-My0084315		X
12	0089_QC212_240528	May 28, 2024		Water	L24-My0084316		X
13	0089_QC213_240528	May 28, 2024		Water	L24-My0084317		X
14	0089_QC214_240528	May 28, 2024		Water	L24-My0084318		X
15	0089_QC215_240528	May 28, 2024		Water	L24-My0084319		X
16	0089_QC216_240528	May 28, 2024		Water	L24-My0084320		X
17	0089_QC217_240528	May 28, 2024		Soil	L24-My0084321	X	X

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Address: 6F 226,Adelaide Terrace
Perth
WA 6000

Project Name: WA_0089_PFASOMP_24
Project ID: WA_0089_PFASOMP_24

Order No.: 304700525/730
Report #: 1102636
Phone: [redacted]
Fax:

Received: May 29, 2024 1:35 PM
Due: Jun 6, 2024
Priority: 5 Day
Contact Name: ALL INVOICES

Eurofins Analytical Services Manager : [redacted]

Sample Detail						Moisture Set	Per- and Polyfluoroalkyl Substances (PFASs)
Perth Laboratory - NATA # 2377 Site # 2370						X	X
External Laboratory							
18	0089_QC218_240528	May 28, 2024		Soil	L24-My0084322	X	X
Test Counts						4	18

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NATA Accredited
Accreditation Number 2377
Site Number 2370

Accredited for compliance with ISO/IEC 17025 – Testing
NATA is a signatory to the ILAC Mutual Recognition Arrangement for the mutual recognition of the equivalence of testing, medical testing, calibration, inspection, proficiency testing scheme providers and reference materials producers reports and certificates.

Attention: **ALL INVOICES**

Report **1102636-S**
Project name WA_0089_PFASOMP_24
Project ID WA_0089_PFASOMP_24
Received Date May 29, 2024

Client Sample ID			**0089_QC207_240528**	**0089_QC210_240528**	**0089_QC217_240528**	**0089_QC218_240528**
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins Sample No.			**L24-My0084311**	**L24-My0084314**	**L24-My0084321**	**L24-My0084322**
Date Sampled			**May 28, 2024**	**May 28, 2024**	**May 28, 2024**	**May 28, 2024**
Test/Reference	LOR	Unit				
Sample Properties						
% Moisture	1	%	30	24	24	14
Perfluoroalkyl carboxylic acids (PFCAs)						
Perfluorobutanoic acid (PFBA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluoropentanoic acid (PFPeA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluorohexanoic acid (PFHxA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluoroheptanoic acid (PFHpA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluorooctanoic acid (PFOA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluorononanoic acid (PFNA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluorodecanoic acid (PFDA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluoroundecanoic acid (PFUnDA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluorododecanoic acid (PFDoDA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluorotridecanoic acid (PFTrDA)[N15]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluorotetradecanoic acid (PFTeDA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
13C4-PFBA (surr.)	1	%	90	93	81	97
13C5-PFPeA (surr.)	1	%	95	94	91	101
13C5-PFHxA (surr.)	1	%	100	93	96	100
13C4-PFHpA (surr.)	1	%	93	93	100	105
13C8-PFOA (surr.)	1	%	88	93	97	96
13C5-PFNA (surr.)	1	%	92	95	92	107
13C6-PFDA (surr.)	1	%	87	86	86	93
13C2-PFUnDA (surr.)	1	%	102	95	90	100
13C2-PFDoDA (surr.)	1	%	111	111	117	122
13C2-PFTeDA (surr.)	1	%	176	173	162	180
Perfluoroalkyl sulfonamido substances						
Perfluorooctane sulfonamide (FOSA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)[N11]	10	ug/kg	< 10	< 10	< 10	< 10
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)[N11]	10	ug/kg	< 10	< 10	< 10	< 10

Client Sample ID			0089_QC207_240528	0089_QC210_240528	0089_QC217_240528	0089_QC218_240528
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			L24-My0084311	L24-My0084314	L24-My0084321	L24-My0084322
Date Sampled			May 28, 2024	May 28, 2024	May 28, 2024	May 28, 2024
Test/Reference	LOR	Unit				
Perfluoroalkyl sulfonamido substances						
13C8-FOSA (surr.)	1	%	96	99	103	107
D3-N-MeFOSA (surr.)	1	%	108	114	115	115
D5-N-EtFOSA (surr.)	1	%	124	126	134	139
D7-N-MeFOSE (surr.)	1	%	94	97	99	101
D9-N-EtFOSE (surr.)	1	%	99	100	108	110
D5-N-EtFOSAA (surr.)	1	%	98	98	100	106
D3-N-MeFOSAA (surr.)	1	%	100	94	106	104
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)						
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)[N11]	10	ug/kg	< 10	< 10	< 10	< 10
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
13C2-4:2 FTSA (surr.)	1	%	92	94	89	93
13C2-6:2 FTSA (surr.)	1	%	94	100	104	93
13C2-8:2 FTSA (surr.)	1	%	93	97	101	101
13C2-10:2 FTSA (surr.)	1	%	116	108	119	118
Perfluoroalkyl sulfonic acids (PFSAs)						
Perfluorobutanesulfonic acid (PFBS)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluorononanesulfonic acid (PFNS)*[N15]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluoropropanesulfonic acid (PFPrS)*[N15]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluoropentanesulfonic acid (PFPeS)[N15]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluorohexanesulfonic acid (PFHxS)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluoroheptanesulfonic acid (PFHpS)[N15]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluorooctanesulfonic acid (PFOS)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluorodecanesulfonic acid (PFDS)[N15]	5	ug/kg	< 5	< 5	< 5	< 5
13C3-PFBS (surr.)	1	%	92	93	92	99
18O2-PFHxS (surr.)	1	%	80	79	84	91
13C8-PFOS (surr.)	1	%	84	91	93	98
PFASs Summations						
Sum (PFHxS + PFOS)*	5	ug/kg	< 5	< 5	< 5	< 5
Sum of PFASs (n=30)*	50	ug/kg	< 50	< 50	< 50	< 50
Sum of US EPA PFAS (PFOS + PFOA)*	5	ug/kg	< 5	< 5	< 5	< 5
Sum of enHealth PFAS (PFHxS + PFOS + PFOA)*	5	ug/kg	< 5	< 5	< 5	< 5
Sum of WA DWER PFAS (n=10)*	10	ug/kg	< 10	< 10	< 10	< 10

Sample History

Where samples are submitted/analysed over several days, the last date of extraction is reported.

If the date and time of sampling are not provided, the Laboratory will not be responsible for compromised results should testing be performed outside the recommended holding time.

Description	Testing Site	Extracted	Holding Time
% Moisture	Welshpool	May 30, 2024	14 Days
- Method: ARL135 Moisture in Solids			
Perfluoroalkyl carboxylic acids (PFCAs)	Welshpool	May 30, 2024	28 Days
- Method: Method ARL0510_ARL0511 PFAS in aqueous & solid samples by LC-MS/MS			
Perfluoroalkyl sulfonamido substances	Welshpool	May 30, 2024	28 Days
- Method: Method ARL0510_ARL0511 PFAS in aqueous & solid samples by LC-MS/MS			
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)	Welshpool	May 30, 2024	28 Days
- Method: Method ARL0510_ARL0511 PFAS in aqueous & solid samples by LC-MS/MS			
Perfluoroalkyl sulfonic acids (PFSAs)	Welshpool	May 30, 2024	28 Days
- Method: Method ARL0510_ARL0511 PFAS in aqueous & solid samples by LC-MS/MS			
PFASs Summations	Welshpool	May 30, 2024	
- Method: Method ARL0510_ARL0511 PFAS in aqueous & solid samples by LC-MS/MS			

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Project Name: WA_0089_PFASOMP_24
Project ID: WA_0089_PFASOMP_24

Order No.: 304700525/730
Report #: 1102636
Phone: [redacted]
Fax:

Received: May 29, 2024 1:35 PM
Due: Jun 6, 2024
Priority: 5 Day
Contact Name: ALL INVOICES

Eurofins Analytical Services Manager : [redacted]

Sample Detail						Moisture Set	Per- and Polyfluoroalkyl Substances (PFASs)
Perth Laboratory - NATA # 2377 Site # 2370						X	X
External Laboratory							
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**		
1	0089_QC201_240527	May 27, 2024		Water	L24-My0084305		X
2	0089_QC202_240527	May 27, 2024		Water	L24-My0084306		X
3	0089_QC203_240527	May 27, 2024		Water	L24-My0084307		X
4	0089_QC204_240527	May 27, 2024		Water	L24-My0084308		X
5	0089_QC205_240527	May 27, 2024		Water	L24-My0084309		X
6	0089_QC206_240528	May 28, 2024		Water	L24-My0084310		X
7	0089_QC207_240528	May 28, 2024		Soil	L24-My0084311	X	X
8	0089_QC208_240528	May 28, 2024		Water	L24-My0084312		X

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Fax:

Received: May 29, 2024 1:35 PM
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Priority: 5 Day
Contact Name: ALL INVOICES

Eurofins Analytical Services Manager : [redacted]

Sample Detail						Moisture Set	Per- and Polyfluoroalkyl Substances (PFASs)
Perth Laboratory - NATA # 2377 Site # 2370						X	X
External Laboratory							
9	0089_QC209_240528	May 28, 2024		Water	L24-My0084313		X
10	0089_QC210_240528	May 28, 2024		Soil	L24-My0084314	X	X
11	0089_QC211_240528	May 28, 2024		Water	L24-My0084315		X
12	0089_QC212_240528	May 28, 2024		Water	L24-My0084316		X
13	0089_QC213_240528	May 28, 2024		Water	L24-My0084317		X
14	0089_QC214_240528	May 28, 2024		Water	L24-My0084318		X
15	0089_QC215_240528	May 28, 2024		Water	L24-My0084319		X
16	0089_QC216_240528	May 28, 2024		Water	L24-My0084320		X
17	0089_QC217_240528	May 28, 2024		Soil	L24-My0084321	X	X

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Contact Name: ALL INVOICES

Eurofins Analytical Services Manager : [redacted]

Sample Detail						Moisture Set	Per- and Polyfluoroalkyl Substances (PFASs)
Perth Laboratory - NATA # 2377 Site # 2370						X	X
External Laboratory							
18	0089_QC218_240528	May 28, 2024		Soil	L24-My0084322	X	X
Test Counts						4	18

Internal Quality Control Review and Glossary

General

1. Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples follow guidelines delineated in the National Environment Protection (Assessment of Site Contamination) Measure 1999, as amended May 2013. They are included in this QC report where applicable. Additional QC data may be available on request.
2. Unless otherwise stated, all soil/sediment/solid results are reported on a dry weight basis.
3. Unless otherwise stated, all biota/food results are reported on a wet weight basis on the edible portion.
4. For CEC results where the sample's origin is unknown or environmentally contaminated, the results should be used advisedly.
5. Actual LORs are matrix dependent. Quoted LORs may be raised where sample extracts are diluted due to interferences.
6. Results are uncorrected for matrix spikes or surrogate recoveries except for PFAS compounds where annotated.
7. SVOC analysis on waters is performed on homogenised, unfiltered samples unless noted otherwise.
8. Samples were analysed on an 'as received' basis.
9. Information identified in this report with **blue** colour indicates data provided by customers that may have an impact on the results.
10. This report replaces any interim results previously issued.

Holding Times

Please refer to the 'Sample Preservation and Container Guide' for holding times (QS3001).

For samples received on the last day of holding time, notification of testing requirements should have been received at least 6 hours before sample receipt deadlines as stated on the SRA.

If the Laboratory did not receive the information in the required timeframe, and despite any other integrity issues, suitably qualified results may still be reported.

Holding times apply from the sampling date; therefore, compliance with these may be outside the laboratory's control.

For VOCs containing vinyl chloride, styrene and 2-chloroethyl vinyl ether, the holding time is seven days; however, for all other VOCs, such as BTEX or C6-10 TRH, the holding time is 14 days.

Units

mg/kg: milligrams per kilogram	**mg/L:** milligrams per litre	**ppm:** parts per million
µg/L: micrograms per litre	**ppb:** parts per billion	**%:** Percentage
org/100 mL: Organisms per 100 millilitres	**NTU:** Nephelometric Turbidity Units	**MPN/100 mL:** Most Probable Number of organisms per 100 millilitres
CFU: Colony Forming Unit	**Colour:** Pt-Co Units (CU)	

Terms

APHA	American Public Health Association
CEC	Cation Exchange Capacity
COC	Chain of Custody
CP	Client Parent - QC was performed on samples pertaining to this report
CRM	Certified Reference Material (ISO17034) - reported as percent recovery.
Dry	Where moisture has been determined on a solid sample, the result is expressed on a dry weight basis.
Duplicate	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
LOR	Limit of Reporting.
LCS	Laboratory Control Sample - reported as percent recovery.
Method Blank	In the case of solid samples, these are performed on laboratory-certified clean sands and in the case of water samples, these are performed on de-ionised water.
NCP	Non-Client Parent - QC performed on samples not pertaining to this report, QC represents the sequence or batch that client samples were analysed within.
RPD	Relative Percent Difference between two Duplicate pieces of analysis.
SPIKE	Addition of the analyte to the sample and reported as percentage recovery.
SRA	Sample Receipt Advice
Surr - Surrogate	The addition of a similar compound to the analyte target is reported as percentage recovery. See below for acceptance criteria.
TBTO	Tributyltin oxide (*bis*-tributyltin oxide) - individual tributyltin compounds cannot be identified separately in the environment; however, free tributyltin was measured, and its values were converted stoichiometrically into tributyltin oxide for comparison with regulatory limits.
TCLP	Toxicity Characteristic Leaching Procedure
TEQ	Toxic Equivalency Quotient or Total Equivalence
QSM	US Department of Defense Quality Systems Manual Version 6.0
US EPA	United States Environmental Protection Agency
WA DWER	Sum of PFBA, PFPeA, PFHxA, PFHpA, PFOA, PFBS, PFHxS, PFOS, 6:2 FTSA, 8:2 FTSA

QC - Acceptance Criteria

The acceptance criteria should only be used as a guide and may be different when site-specific Sampling Analysis and Quality Plan (SAQP) have been implemented.

RPD Duplicates: Global RPD Duplicates Acceptance Criteria is ≤30%; however, the following acceptance guidelines are equally applicable:

Results <10 times the LOR:	No Limit
Results between 10-20 times the LOR:	RPD must lie between 0-50%
Results >20 times the LOR:	RPD must lie between 0-30%

NOTE: pH duplicates are reported as a range, not as RPD

Surrogate Recoveries: Recoveries must lie between 20-130% for Speciated Phenols & 50-150% for PFAS. SVOCs recoveries 20 – 150%, VOC recoveries 50 – 150%

PFAS field samples containing surrogate recoveries above the QC limit designated in QSM 6.0, where no positive PFAS results have been reported or reviewed, and no data was affected.

QC Data General Comments

1. Where a result is reported as less than (<), higher than the nominated LOR, this is due to either matrix interference, extract dilution required due to interferences or contaminant levels within the sample, high moisture content or insufficient sample provided.
2. Duplicate data shown within this report that states the word "BATCH" is a Batch Duplicate from outside of your sample batch but within the laboratory sample batch at a 1:10 ratio. The Parent and Duplicate data shown are not data from your samples.
3. pH and Free Chlorine analysed in the laboratory - Analysis on this test must begin within 30 minutes of sampling. Therefore, laboratory analysis is unlikely to be completed within holding time.Analysis will begin as soon as possible after sample receipt.
4. Recovery Data (Spikes & Surrogates) - where chromatographic interference does not allow the determination of recovery, the term "INT" appears against that analyte.
5. For Matrix Spikes and LCS results, a dash "-" in the report means that the specific analyte was not added to the QC sample.
6. Duplicate RPDs are calculated from raw analytical data; thus, it is possible to have two sets of data.

Quality Control Results

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Method Blank							
Perfluoroalkyl carboxylic acids (PFCAs)							
Perfluorobutanoic acid (PFBA)	ug/kg	< 5			5	Pass	
Perfluoropentanoic acid (PFPeA)	ug/kg	< 5			5	Pass	
Perfluorohexanoic acid (PFHxA)	ug/kg	< 5			5	Pass	
Perfluoroheptanoic acid (PFHpA)	ug/kg	< 5			5	Pass	
Perfluorooctanoic acid (PFOA)	ug/kg	< 5			5	Pass	
Perfluorononanoic acid (PFNA)	ug/kg	< 5			5	Pass	
Perfluorodecanoic acid (PFDA)	ug/kg	< 5			5	Pass	
Perfluoroundecanoic acid (PFUnDA)	ug/kg	< 5			5	Pass	
Perfluorododecanoic acid (PFDoDA)	ug/kg	< 5			5	Pass	
Perfluorotridecanoic acid (PFTrDA)	ug/kg	< 5			5	Pass	
Perfluorotetradecanoic acid (PFTeDA)	ug/kg	< 5			5	Pass	
Method Blank							
Perfluoroalkyl sulfonamido substances							
Perfluorooctane sulfonamide (FOSA)	ug/kg	< 5			5	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	ug/kg	< 5			5	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	ug/kg	< 5			5	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)	ug/kg	< 5			5	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)	ug/kg	< 5			5	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	ug/kg	< 10			10	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	ug/kg	< 10			10	Pass	
Method Blank							
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)							
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	ug/kg	< 5			5	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)	ug/kg	< 10			10	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	ug/kg	< 5			5	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	ug/kg	< 5			5	Pass	
Method Blank							
Perfluoroalkyl sulfonic acids (PFSAs)							
Perfluorobutanesulfonic acid (PFBS)	ug/kg	< 5			5	Pass	
Perfluorononanesulfonic acid (PFNS)*	ug/kg	< 5			5	Pass	
Perfluoropropanesulfonic acid (PFPrS)*	ug/kg	< 5			5	Pass	
Perfluoropentanesulfonic acid (PFPeS)	ug/kg	< 5			5	Pass	
Perfluorohexanesulfonic acid (PFHxS)	ug/kg	< 5			5	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	ug/kg	< 5			5	Pass	
Perfluorooctanesulfonic acid (PFOS)	ug/kg	< 5			5	Pass	
Perfluorodecanesulfonic acid (PFDS)	ug/kg	< 5			5	Pass	
Method Blank							
Perfluoroalkyl carboxylic acids (PFCAs)							
Perfluorobutanoic acid (PFBA)	ug/kg	< 5			5	Pass	
Perfluoropentanoic acid (PFPeA)	ug/kg	< 5			5	Pass	
Perfluorohexanoic acid (PFHxA)	ug/kg	< 5			5	Pass	
Perfluoroheptanoic acid (PFHpA)	ug/kg	< 5			5	Pass	
Perfluorooctanoic acid (PFOA)	ug/kg	< 5			5	Pass	
Perfluorononanoic acid (PFNA)	ug/kg	< 5			5	Pass	
Perfluorodecanoic acid (PFDA)	ug/kg	< 5			5	Pass	
Perfluoroundecanoic acid (PFUnDA)	ug/kg	< 5			5	Pass	
Perfluorododecanoic acid (PFDoDA)	ug/kg	< 5			5	Pass	
Perfluorotridecanoic acid (PFTrDA)	ug/kg	< 5			5	Pass	
Perfluorotetradecanoic acid (PFTeDA)	ug/kg	< 5			5	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Method Blank							
Perfluoroalkyl sulfonamido substances							
Perfluorooctane sulfonamide (FOSA)	ug/kg	< 5			5	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	ug/kg	< 5			5	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	ug/kg	< 5			5	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)	ug/kg	< 5			5	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)	ug/kg	< 5			5	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	ug/kg	< 10			10	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	ug/kg	< 10			10	Pass	
Method Blank							
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)							
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	ug/kg	< 5			5	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)	ug/kg	< 10			10	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	ug/kg	< 5			5	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	ug/kg	< 5			5	Pass	
Method Blank							
Perfluoroalkyl sulfonic acids (PFSAs)							
Perfluorobutanesulfonic acid (PFBS)	ug/kg	< 5			5	Pass	
Perfluorononanesulfonic acid (PFNS)*	ug/kg	< 5			5	Pass	
Perfluoropropanesulfonic acid (PFPrS)*	ug/kg	< 5			5	Pass	
Perfluoropentanesulfonic acid (PFPeS)	ug/kg	< 5			5	Pass	
Perfluorohexanesulfonic acid (PFHxS)	ug/kg	< 5			5	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	ug/kg	< 5			5	Pass	
Perfluorooctanesulfonic acid (PFOS)	ug/kg	< 5			5	Pass	
Perfluorodecanesulfonic acid (PFDS)	ug/kg	< 5			5	Pass	
LCS - % Recovery							
Perfluoroalkyl carboxylic acids (PFCAs)							
Perfluorobutanoic acid (PFBA)	%	67			50-150	Pass	
Perfluoropentanoic acid (PFPeA)	%	78			50-150	Pass	
Perfluorohexanoic acid (PFHxA)	%	87			50-150	Pass	
Perfluoroheptanoic acid (PFHpA)	%	80			50-150	Pass	
Perfluorooctanoic acid (PFOA)	%	82			50-150	Pass	
Perfluorononanoic acid (PFNA)	%	81			50-150	Pass	
Perfluorodecanoic acid (PFDA)	%	87			50-150	Pass	
Perfluoroundecanoic acid (PFUnDA)	%	85			50-150	Pass	
Perfluorododecanoic acid (PFDoDA)	%	85			50-150	Pass	
Perfluorotridecanoic acid (PFTrDA)	%	60			50-150	Pass	
Perfluorotetradecanoic acid (PFTeDA)	%	75			50-150	Pass	
LCS - % Recovery							
Perfluoroalkyl sulfonamido substances							
Perfluorooctane sulfonamide (FOSA)	%	80			50-150	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	%	84			50-150	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	%	80			50-150	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)	%	75			50-150	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)	%	74			50-150	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	%	85			50-150	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	%	87			50-150	Pass	
LCS - % Recovery							
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)							
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	%	79			50-150	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)	%	84			50-150	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	%	79			50-150	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	%	78			50-150	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
LCS - % Recovery							
Perfluoroalkyl sulfonic acids (PFSAs)							
Perfluorobutanesulfonic acid (PFBS)	%	76			50-150	Pass	
Perfluorononanesulfonic acid (PFNS)*	%	75			50-150	Pass	
Perfluoropropanesulfonic acid (PFPrS)*	%	77			50-150	Pass	
Perfluoropentanesulfonic acid (PFPeS)	%	83			50-150	Pass	
Perfluorohexanesulfonic acid (PFHxS)	%	81			50-150	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	%	74			50-150	Pass	
Perfluorooctanesulfonic acid (PFOS)	%	77			50-150	Pass	
Perfluorodecanesulfonic acid (PFDS)	%	87			50-150	Pass	
LCS - % Recovery							
Perfluoroalkyl carboxylic acids (PFCAs)							
Perfluorobutanoic acid (PFBA)	%	60			50-150	Pass	
Perfluoropentanoic acid (PFPeA)	%	59			50-150	Pass	
Perfluorohexanoic acid (PFHxA)	%	73			50-150	Pass	
Perfluoroheptanoic acid (PFHpA)	%	67			50-150	Pass	
Perfluorooctanoic acid (PFOA)	%	74			50-150	Pass	
Perfluorononanoic acid (PFNA)	%	67			50-150	Pass	
Perfluorodecanoic acid (PFDA)	%	75			50-150	Pass	
Perfluoroundecanoic acid (PFUnDA)	%	77			50-150	Pass	
Perfluorododecanoic acid (PFDoDA)	%	67			50-150	Pass	
Perfluorotridecanoic acid (PFTrDA)	%	61			50-150	Pass	
Perfluorotetradecanoic acid (PFTeDA)	%	63			50-150	Pass	
LCS - % Recovery							
Perfluoroalkyl sulfonamido substances							
Perfluorooctane sulfonamide (FOSA)	%	65			50-150	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	%	72			50-150	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	%	63			50-150	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)	%	62			50-150	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)	%	61			50-150	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	%	59			50-150	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	%	70			50-150	Pass	
LCS - % Recovery							
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)							
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	%	74			50-150	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)	%	80			50-150	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	%	75			50-150	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	%	63			50-150	Pass	
LCS - % Recovery							
Perfluoroalkyl sulfonic acids (PFSAs)							
Perfluorobutanesulfonic acid (PFBS)	%	60			50-150	Pass	
Perfluorononanesulfonic acid (PFNS)*	%	61			50-150	Pass	
Perfluoropropanesulfonic acid (PFPrS)*	%	67			50-150	Pass	
Perfluoropentanesulfonic acid (PFPeS)	%	64			50-150	Pass	
Perfluorohexanesulfonic acid (PFHxS)	%	62			50-150	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	%	67			50-150	Pass	
Perfluorooctanesulfonic acid (PFOS)	%	66			50-150	Pass	
Perfluorodecanesulfonic acid (PFDS)	%	69			50-150	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Spike - % Recovery									
Perfluoroalkyl carboxylic acids (PFCAs)				Result 1					
Perfluorobutanoic acid (PFBA)	L24-My0079156	NCP	%	81			50-150	Pass	
Perfluoropentanoic acid (PFPeA)	L24-My0079156	NCP	%	87			50-150	Pass	
Perfluorohexanoic acid (PFHxA)	L24-My0079156	NCP	%	91			50-150	Pass	
Perfluoroheptanoic acid (PFHpA)	L24-My0079156	NCP	%	92			50-150	Pass	
Perfluorooctanoic acid (PFOA)	L24-My0079156	NCP	%	89			50-150	Pass	
Perfluorononanoic acid (PFNA)	L24-My0079156	NCP	%	79			50-150	Pass	
Perfluorodecanoic acid (PFDA)	L24-My0079156	NCP	%	93			50-150	Pass	
Perfluoroundecanoic acid (PFUnDA)	L24-My0079156	NCP	%	92			50-150	Pass	
Perfluorododecanoic acid (PFDoDA)	L24-My0079156	NCP	%	81			50-150	Pass	
Perfluorotridecanoic acid (PFTrDA)	L24-My0079156	NCP	%	56			50-150	Pass	
Perfluorotetradecanoic acid (PFTeDA)	L24-My0079156	NCP	%	79			50-150	Pass	
Spike - % Recovery									
Perfluoroalkyl sulfonamido substances				Result 1					
Perfluorooctane sulfonamide (FOSA)	L24-My0079156	NCP	%	87			50-150	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	L24-My0079156	NCP	%	90			50-150	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	L24-My0079156	NCP	%	81			50-150	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)	L24-My0079156	NCP	%	78			50-150	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)	L24-My0079156	NCP	%	76			50-150	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	L24-My0079156	NCP	%	87			50-150	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	L24-My0079156	NCP	%	85			50-150	Pass	
Spike - % Recovery									
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)				Result 1					
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	L24-My0079156	NCP	%	89			50-150	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)	L24-My0079156	NCP	%	89			50-150	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	L24-My0079156	NCP	%	90			50-150	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	L24-My0079156	NCP	%	79			50-150	Pass	
Spike - % Recovery									
Perfluoroalkyl sulfonic acids (PFSAs)				Result 1					
Perfluorobutanesulfonic acid (PFBS)	L24-My0079156	NCP	%	71			50-150	Pass	
Perfluorononanesulfonic acid (PFNS)*	L24-My0079156	NCP	%	115			50-150	Pass	
Perfluoropropanesulfonic acid (PFPrS)*	L24-My0079156	NCP	%	86			50-150	Pass	
Perfluoropentanesulfonic acid (PFPeS)	L24-My0079156	NCP	%	99			50-150	Pass	
Perfluorohexanesulfonic acid (PFHxS)	L24-My0079156	NCP	%	79			50-150	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	L24-My0079156	NCP	%	73			50-150	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Perfluorooctanesulfonic acid (PFOS)	L24-My0079156	NCP	%	80			50-150	Pass	
Perfluorodecanesulfonic acid (PFDS)	L24-My0079156	NCP	%	100			50-150	Pass	
Test	**Lab Sample ID**	**QA Source**	**Units**	**Result 1**			**Acceptance Limits**	**Pass Limits**	**Qualifying Code**
Duplicate									
Sample Properties				Result 1	Result 2	RPD			
% Moisture	L24-My0082376	NCP	%	9.2	10	12	30%	Pass	
Duplicate									
Perfluoroalkyl carboxylic acids (PFCAs)				Result 1	Result 2	RPD			
Perfluorobutanoic acid (PFBA)	L24-My0084321	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluoropentanoic acid (PFPeA)	L24-My0084321	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorohexanoic acid (PFHxA)	L24-My0084321	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluoroheptanoic acid (PFHpA)	L24-My0084321	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorooctanoic acid (PFOA)	L24-My0084321	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorononanoic acid (PFNA)	L24-My0084321	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorodecanoic acid (PFDA)	L24-My0084321	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluoroundecanoic acid (PFUnDA)	L24-My0084321	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorododecanoic acid (PFDoDA)	L24-My0084321	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorotridecanoic acid (PFTrDA)	L24-My0084321	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorotetradecanoic acid (PFTeDA)	L24-My0084321	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Duplicate									
Perfluoroalkyl sulfonamido substances				Result 1	Result 2	RPD			
Perfluorooctane sulfonamide (FOSA)	L24-My0084321	CP	ug/kg	< 5	< 5	<1	30%	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	L24-My0084321	CP	ug/kg	< 5	< 5	<1	30%	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	L24-My0084321	CP	ug/kg	< 5	< 5	<1	30%	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)	L24-My0084321	CP	ug/kg	< 5	< 5	<1	30%	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)	L24-My0084321	CP	ug/kg	< 5	< 5	<1	30%	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	L24-My0084321	CP	ug/kg	< 10	< 10	<1	30%	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	L24-My0084321	CP	ug/kg	< 10	< 10	<1	30%	Pass	
Duplicate									
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)				Result 1	Result 2	RPD			
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	L24-My0084321	CP	ug/kg	< 5	< 5	<1	30%	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)	L24-My0084321	CP	ug/kg	< 10	< 10	<1	30%	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	L24-My0084321	CP	ug/kg	< 5	< 5	<1	30%	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	L24-My0084321	CP	ug/kg	< 5	< 5	<1	30%	Pass	

Duplicate									
Perfluoroalkyl sulfonic acids (PFSAs)				Result 1	Result 2	RPD			
Perfluorobutanesulfonic acid (PFBS)	L24-My0084321	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorononanesulfonic acid (PFNS)*	L24-My0084321	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluoropropanesulfonic acid (PFPrS)*	L24-My0084321	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluoropentanesulfonic acid (PFPeS)	L24-My0084321	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorohexanesulfonic acid (PFHxS)	L24-My0084321	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	L24-My0084321	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorooctanesulfonic acid (PFOS)	L24-My0084321	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorodecanesulfonic acid (PFDS)	L24-My0084321	CP	ug/kg	< 5	< 5	<1	30%	Pass	

Comments

Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	Yes
Sample correctly preserved	Yes
Appropriate sample containers have been used	Yes
Sample containers for volatile analysis received with minimal headspace	N/A
Samples received within HoldingTime	Yes
Some samples have been subcontracted	No

Qualifier Codes/Comments

Code	Description
N11	Isotope dilution is used for calibration of each native compound for which an exact labelled analogue is available (Isotope Dilution Quantitation). The isotopically labelled analogues allow identification and recovery correction of the concentration of the associated native PFAS compounds.
N15	Where the native PFAS compound does not have labelled analogue then the quantification is made using the Extracted Internal Standard Analyte with the closest retention time to the analyte and no recovery correction has been made (Internal Standard Quantitation).

Authorised by:

[redacted] Analytical Services Manager
[redacted] Senior Analyst-Sample Properties
[redacted] Senior Analyst-PFAS

[redacted]
General Manager

- Indicates Not Requested

* Indicates NATA accreditation does not cover the performance of this service

Measurement uncertainty of test data is available on request

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Stantec Australia Pty Limited
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WA 6000

NATA Accredited
Accreditation Number 2377
Site Number 2370

Accredited for compliance with ISO/IEC 17025 – Testing
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Attention: **ALL INVOICES**

Report **1102636-W**
Project name WA_0089_PFASOMP_24
Project ID WA_0089_PFASOMP_24
Received Date May 29, 2024

Client Sample ID			**0089_QC201_240527**	**0089_QC202_240527**	**0089_QC203_240527**	**0089_QC204_240527**
Sample Matrix			**Water**	**Water**	**Water**	**Water**
Eurofins Sample No.			**L24-My0084305**	**L24-My0084306**	**L24-My0084307**	**L24-My0084308**
Date Sampled			**May 27, 2024**	**May 27, 2024**	**May 27, 2024**	**May 27, 2024**
Test/Reference	LOR	Unit				
Perfluoroalkyl carboxylic acids (PFCAs)						
Perfluorobutanoic acid (PFBA)[N11]	0.05	ug/L	0.15	< 0.05	< 0.05	0.66
Perfluoropentanoic acid (PFPeA)[N11]	0.01	ug/L	0.52	< 0.01	< 0.01	0.82
Perfluorohexanoic acid (PFHxA)[N11]	0.01	ug/L	0.50	< 0.01	< 0.01	3.5
Perfluoroheptanoic acid (PFHpA)[N11]	0.05	ug/L	[N09]0.24	< 0.05	< 0.05	[N09]0.35
Perfluorooctanoic acid (PFOA)[N11]	0.01	ug/L	[N09]0.30	[N09]0.01	[N09]0.01	[N09]1.0
Perfluorononanoic acid (PFNA)[N11]	0.01	ug/L	0.06	< 0.01	< 0.01	0.01
Perfluorodecanoic acid (PFDA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluoroundecanoic acid (PFUnDA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorododecanoic acid (PFDoDA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorotridecanoic acid (PFTrDA)[N15]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorotetradecanoic acid (PFTeDA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
13C4-PFBA (surr.)	1	%	70	72	81	94
13C5-PFPeA (surr.)	1	%	63	81	77	86
13C5-PFHxA (surr.)	1	%	65	86	82	69
13C4-PFHpA (surr.)	1	%	64	84	85	88
13C8-PFOA (surr.)	1	%	68	94	80	63
13C5-PFNA (surr.)	1	%	62	79	72	68
13C6-PFDA (surr.)	1	%	52	92	58	35
13C2-PFUnDA (surr.)	1	%	34	54	40	39
13C2-PFDoDA (surr.)	1	%	24	43	25	26
13C2-PFTeDA (surr.)	1	%	16	25	13	14
Perfluoroalkyl sulfonamido substances						
Perfluorooctane sulfonamide (FOSA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
13C8-FOSA (surr.)	1	%	55	77	76	80
D3-N-MeFOSA (surr.)	1	%	31	61	44	47

Client Sample ID			0089_QC201_240527	0089_QC202_240527	0089_QC203_240527	0089_QC204_240527
Sample Matrix			Water	Water	Water	Water
Eurofins Sample No.			L24-My0084305	L24-My0084306	L24-My0084307	L24-My0084308
Date Sampled			May 27, 2024	May 27, 2024	May 27, 2024	May 27, 2024
Test/Reference	LOR	Unit				
Perfluoroalkyl sulfonamido substances						
D5-N-EtFOSA (surr.)	1	%	29	61	41	40
D7-N-MeFOSE (surr.)	1	%	27	64	48	55
D9-N-EtFOSE (surr.)	1	%	25	66	47	53
D5-N-EtFOSAA (surr.)	1	%	33	57	44	42
D3-N-MeFOSAA (surr.)	1	%	37	58	48	43
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)						
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)[N11]	0.05	ug/L	0.12	< 0.05	0.14	0.07
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
13C2-4:2 FTSA (surr.)	1	%	66	89	88	95
13C2-6:2 FTSA (surr.)	1	%	70	79	89	85
13C2-8:2 FTSA (surr.)	1	%	49	71	64	61
13C2-10:2 FTSA (surr.)	1	%	27	48	34	37
Perfluoroalkyl sulfonic acids (PFSAs)						
Perfluorobutanesulfonic acid (PFBS)[N11]	0.01	ug/L	0.12	< 0.01	< 0.01	2.0
Perfluorononanesulfonic acid (PFNS)*[N15]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluoropropanesulfonic acid (PFPrS)*[N15]	0.01	ug/L	0.04	< 0.01	< 0.01	1.6
Perfluoropentanesulfonic acid (PFPeS)[N15]	0.01	ug/L	0.07	< 0.01	< 0.01	1.8
Perfluorohexanesulfonic acid (PFHxS)[N11]	0.01	ug/L	3.3	0.04	0.03	15
Perfluoroheptanesulfonic acid (PFHpS)[N15]	0.01	ug/L	1.1	< 0.01	< 0.01	3.3
Perfluorooctanesulfonic acid (PFOS)[N11]	0.01	ug/L	13	0.02	0.03	20
Perfluorodecanesulfonic acid (PFDS)[N15]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
13C3-PFBS (surr.)	1	%	71	84	80	72
18O2-PFHxS (surr.)	1	%	52	75	74	62
13C8-PFOS (surr.)	1	%	46	67	58	52
PFASs Summations						
Sum (PFHxS + PFOS)*	0.01	ug/L	16.3	0.06	0.06	35
Sum of PFASs (n=30)*	0.1	ug/L	19.52	< 0.1	0.21	50.11
Sum of US EPA PFAS (PFOS + PFOA)*	0.01	ug/L	13.3	0.03	0.04	21
Sum of enHealth PFAS (PFHxS + PFOS + PFOA)*	0.01	ug/L	16.6	0.07	0.07	36
Sum of WA DWER PFAS (n=10)*	0.05	ug/L	18.25	0.07	0.21	43.4

Client Sample ID			0089_QC205_240527	0089_QC206_240528	0089_QC208_240528	0089_QC209_240528
Sample Matrix			Water	Water	Water	Water
Eurofins Sample No.			L24-My0084309	L24-My0084310	L24-My0084312	L24-My0084313
Date Sampled			May 27, 2024	May 28, 2024	May 28, 2024	May 28, 2024
Test/Reference	LOR	Unit				
Perfluoroalkyl carboxylic acids (PFCAs)						
Perfluorobutanoic acid (PFBA)[N11]	0.05	ug/L	0.30	0.89	< 0.05	< 0.05
Perfluoropentanoic acid (PFPeA)[N11]	0.01	ug/L	0.69	5.4	< 0.01	< 0.01
Perfluorohexanoic acid (PFHxA)[N11]	0.01	ug/L	3.3	4.3	< 0.01	< 0.01
Perfluoroheptanoic acid (PFHpA)[N11]	0.05	ug/L	[N09]0.40	[N09]1.2	< 0.05	< 0.05
Perfluorooctanoic acid (PFOA)[N11]	0.01	ug/L	[N09]1.6	[N09]0.25	< 0.01	< 0.01
Perfluorononanoic acid (PFNA)[N11]	0.01	ug/L	0.06	< 0.01	< 0.01	< 0.01
Perfluorodecanoic acid (PFDA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluoroundecanoic acid (PFUnDA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorododecanoic acid (PFDoDA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorotridecanoic acid (PFTrDA)[N15]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorotetradecanoic acid (PFTeDA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
13C4-PFBA (surr.)	1	%	95	93	109	100
13C5-PFPeA (surr.)	1	%	90	82	107	95
13C5-PFHxA (surr.)	1	%	80	91	110	97
13C4-PFHpA (surr.)	1	%	92	98	99	93
13C8-PFOA (surr.)	1	%	61	99	102	111
13C5-PFNA (surr.)	1	%	82	92	88	84
13C6-PFDA (surr.)	1	%	66	69	71	73
13C2-PFUnDA (surr.)	1	%	79	43	48	34
13C2-PFDoDA (surr.)	1	%	75	22	35	22
13C2-PFTeDA (surr.)	1	%	51	13	30	14
Perfluoroalkyl sulfonamido substances						
Perfluorooctane sulfonamide (FOSA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
13C8-FOSA (surr.)	1	%	88	78	79	73
D3-N-MeFOSA (surr.)	1	%	59	32	48	41
D5-N-EtFOSA (surr.)	1	%	52	27	45	35
D7-N-MeFOSE (surr.)	1	%	62	37	50	36
D9-N-EtFOSE (surr.)	1	%	55	35	49	36
D5-N-EtFOSAA (surr.)	1	%	86	36	43	33
D3-N-MeFOSAA (surr.)	1	%	82	44	53	41
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)						
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)[N11]	0.05	ug/L	0.23	0.76	< 0.05	< 0.05
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
13C2-4:2 FTSA (surr.)	1	%	94	100	96	94

Client Sample ID			0089_QC205_240527	0089_QC206_240528	0089_QC208_240528	0089_QC209_240528
Sample Matrix			Water	Water	Water	Water
Eurofins Sample No.			L24-My0084309	L24-My0084310	L24-My0084312	L24-My0084313
Date Sampled			May 27, 2024	May 28, 2024	May 28, 2024	May 28, 2024
Test/Reference	LOR	Unit				
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)						
13C2-6:2 FTSA (surr.)	1	%	93	97	94	84
13C2-8:2 FTSA (surr.)	1	%	90	73	72	61
13C2-10:2 FTSA (surr.)	1	%	85	30	46	28
Perfluoroalkyl sulfonic acids (PFSAs)						
Perfluorobutanesulfonic acid (PFBS)[N11]	0.01	ug/L	1.2	0.32	< 0.01	< 0.01
Perfluorononanesulfonic acid (PFNS)*[N15]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluoropropanesulfonic acid (PFPrS)*[N15]	0.01	ug/L	0.57	0.11	< 0.01	< 0.01
Perfluoropentanesulfonic acid (PFPeS)[N15]	0.01	ug/L	1.8	0.24	< 0.01	< 0.01
Perfluorohexanesulfonic acid (PFHxS)[N11]	0.01	ug/L	21	0.55	< 0.01	< 0.01
Perfluoroheptanesulfonic acid (PFHpS)[N15]	0.01	ug/L	1.3	< 0.01	< 0.01	< 0.01
Perfluorooctanesulfonic acid (PFOS)[N11]	0.01	ug/L	6.1	< 0.01	< 0.01	< 0.01
Perfluorodecanesulfonic acid (PFDS)[N15]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
13C3-PFBS (surr.)	1	%	94	96	96	84
18O2-PFHxS (surr.)	1	%	66	91	94	79
13C8-PFOS (surr.)	1	%	72	75	70	57
PFASs Summations						
Sum (PFHxS + PFOS)*	0.01	ug/L	27.1	0.55	< 0.01	< 0.01
Sum of PFASs (n=30)*	0.1	ug/L	38.55	14.02	< 0.1	< 0.1
Sum of US EPA PFAS (PFOS + PFOA)*	0.01	ug/L	7.7	0.25	< 0.01	< 0.01
Sum of enHealth PFAS (PFHxS + PFOS + PFOA)*	0.01	ug/L	28.7	0.8	< 0.01	< 0.01
Sum of WA DWER PFAS (n=10)*	0.05	ug/L	34.82	13.67	< 0.05	< 0.05

Client Sample ID			0089_QC211_240528	0089_QC212_240528	0089_QC213_240528	0089_QC214_240528
Sample Matrix			Water	Water	Water	Water
Eurofins Sample No.			L24-My0084315	L24-My0084316	L24-My0084317	L24-My0084318
Date Sampled			May 28, 2024	May 28, 2024	May 28, 2024	May 28, 2024
Test/Reference	LOR	Unit				
Perfluoroalkyl carboxylic acids (PFCAs)						
Perfluorobutanoic acid (PFBA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
Perfluoropentanoic acid (PFPeA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorohexanoic acid (PFHxA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluoroheptanoic acid (PFHpA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
Perfluorooctanoic acid (PFOA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorononanoic acid (PFNA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorodecanoic acid (PFDA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluoroundecanoic acid (PFUnDA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorododecanoic acid (PFDoDA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorotridecanoic acid (PFTrDA)[N15]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorotetradecanoic acid (PFTeDA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
13C4-PFBA (surr.)	1	%	84	85	95	102
13C5-PFPeA (surr.)	1	%	87	92	87	98
13C5-PFHxA (surr.)	1	%	85	81	86	98
13C4-PFHpA (surr.)	1	%	94	89	91	105
13C8-PFOA (surr.)	1	%	106	122	88	125
13C5-PFNA (surr.)	1	%	88	81	79	95
13C6-PFDA (surr.)	1	%	90	90	69	93

Client Sample ID			0089_QC211_240528	0089_QC212_240528	0089_QC213_240528	0089_QC214_240528
Sample Matrix			Water	Water	Water	Water
Eurofins Sample No.			L24-My0084315	L24-My0084316	L24-My0084317	L24-My0084318
Date Sampled			May 28, 2024	May 28, 2024	May 28, 2024	May 28, 2024
Test/Reference	LOR	Unit				
Perfluoroalkyl carboxylic acids (PFCAs)						
13C2-PFUnDA (surr.)	1	%	57	52	49	54
13C2-PFDoDA (surr.)	1	%	41	43	36	41
13C2-PFTeDA (surr.)	1	%	29	19	16	39
Perfluoroalkyl sulfonamido substances						
Perfluorooctane sulfonamide (FOSA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
13C8-FOSA (surr.)	1	%	62	76	73	80
D3-N-MeFOSA (surr.)	1	%	34	53	44	47
D5-N-EtFOSA (surr.)	1	%	34	51	40	45
D7-N-MeFOSE (surr.)	1	%	33	56	57	42
D9-N-EtFOSE (surr.)	1	%	31	58	55	44
D5-N-EtFOSAA (surr.)	1	%	44	57	50	47
D3-N-MeFOSAA (surr.)	1	%	53	55	53	54
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)						
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
13C2-4:2 FTSA (surr.)	1	%	77	82	90	80
13C2-6:2 FTSA (surr.)	1	%	95	84	84	101
13C2-8:2 FTSA (surr.)	1	%	79	64	68	79
13C2-10:2 FTSA (surr.)	1	%	54	50	44	47
Perfluoroalkyl sulfonic acids (PFSAs)						
Perfluorobutanesulfonic acid (PFBS)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorononanesulfonic acid (PFNS)*[N15]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluoropropanesulfonic acid (PFPrS)*[N15]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluoropentanesulfonic acid (PFPeS)[N15]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorohexanesulfonic acid (PFHxS)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluoroheptanesulfonic acid (PFHpS)[N15]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorooctanesulfonic acid (PFOS)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorodecanesulfonic acid (PFDS)[N15]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
13C3-PFBS (surr.)	1	%	79	81	73	92
18O2-PFHxS (surr.)	1	%	86	82	84	89
13C8-PFOS (surr.)	1	%	74	63	63	79

Client Sample ID			0089_QC211_240528	0089_QC212_240528	0089_QC213_240528	0089_QC214_240528
Sample Matrix			**Water**	**Water**	**Water**	**Water**
Eurofins Sample No.			**L24-My0084315**	**L24-My0084316**	**L24-My0084317**	**L24-My0084318**
Date Sampled			**May 28, 2024**	**May 28, 2024**	**May 28, 2024**	**May 28, 2024**
Test/Reference	LOR	Unit				
PFASs Summations						
Sum (PFHxS + PFOS)*	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Sum of PFASs (n=30)*	0.1	ug/L	< 0.1	< 0.1	< 0.1	< 0.1
Sum of US EPA PFAS (PFOS + PFOA)*	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Sum of enHealth PFAS (PFHxS + PFOS + PFOA)*	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Sum of WA DWER PFAS (n=10)*	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05

Client Sample ID			0089_QC215_240528	0089_QC216_240528
Sample Matrix			**Water**	**Water**
Eurofins Sample No.			**L24-My0084319**	**L24-My0084320**
Date Sampled			**May 28, 2024**	**May 28, 2024**
Test/Reference	LOR	Unit		
Perfluoroalkyl carboxylic acids (PFCAs)				
Perfluorobutanoic acid (PFBA)[N11]	0.05	ug/L	< 0.05	< 0.05
Perfluoropentanoic acid (PFPeA)[N11]	0.01	ug/L	< 0.01	< 0.01
Perfluorohexanoic acid (PFHxA)[N11]	0.01	ug/L	< 0.01	< 0.01
Perfluoroheptanoic acid (PFHpA)[N11]	0.05	ug/L	< 0.05	< 0.05
Perfluorooctanoic acid (PFOA)[N11]	0.01	ug/L	< 0.01	< 0.01
Perfluorononanoic acid (PFNA)[N11]	0.01	ug/L	< 0.01	< 0.01
Perfluorodecanoic acid (PFDA)[N11]	0.01	ug/L	< 0.01	< 0.01
Perfluoroundecanoic acid (PFUnDA)[N11]	0.01	ug/L	< 0.01	< 0.01
Perfluorododecanoic acid (PFDoDA)[N11]	0.01	ug/L	< 0.01	< 0.01
Perfluorotridecanoic acid (PFTrDA)[N15]	0.01	ug/L	< 0.01	< 0.01
Perfluorotetradecanoic acid (PFTeDA)[N11]	0.01	ug/L	< 0.01	< 0.01
13C4-PFBA (surr.)	1	%	103	97
13C5-PFPeA (surr.)	1	%	100	96
13C5-PFHxA (surr.)	1	%	93	100
13C4-PFHpA (surr.)	1	%	97	104
13C8-PFOA (surr.)	1	%	101	100
13C5-PFNA (surr.)	1	%	89	95
13C6-PFDA (surr.)	1	%	75	81
13C2-PFUnDA (surr.)	1	%	59	65
13C2-PFDoDA (surr.)	1	%	40	42
13C2-PFTeDA (surr.)	1	%	24	16
Perfluoroalkyl sulfonamido substances				
Perfluorooctane sulfonamide (FOSA)[N11]	0.05	ug/L	< 0.05	< 0.05
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)[N11]	0.05	ug/L	< 0.05	< 0.05
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)[N11]	0.05	ug/L	< 0.05	< 0.05
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)[N11]	0.05	ug/L	< 0.05	< 0.05
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)[N11]	0.05	ug/L	< 0.05	< 0.05
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)[N11]	0.05	ug/L	< 0.05	< 0.05
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)[N11]	0.05	ug/L	< 0.05	< 0.05
13C8-FOSA (surr.)	1	%	74	71

Client Sample ID			0089_QC215_240528	0089_QC216_240528
Sample Matrix			Water	Water
Eurofins Sample No.			L24-My0084319	L24-My0084320
Date Sampled			May 28, 2024	May 28, 2024
Test/Reference	LOR	Unit		
Perfluoroalkyl sulfonamido substances				
D3-N-MeFOSA (surr.)	1	%	41	35
D5-N-EtFOSA (surr.)	1	%	39	30
D7-N-MeFOSE (surr.)	1	%	39	35
D9-N-EtFOSE (surr.)	1	%	38	29
D5-N-EtFOSAA (surr.)	1	%	49	46
D3-N-MeFOSAA (surr.)	1	%	57	57
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)				
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)[N11]	0.01	ug/L	< 0.01	< 0.01
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)[N11]	0.05	ug/L	< 0.05	< 0.05
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)[N11]	0.01	ug/L	< 0.01	< 0.01
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)[N11]	0.01	ug/L	< 0.01	< 0.01
13C2-4:2 FTSA (surr.)	1	%	93	97
13C2-6:2 FTSA (surr.)	1	%	94	114
13C2-8:2 FTSA (surr.)	1	%	75	93
13C2-10:2 FTSA (surr.)	1	%	43	49
Perfluoroalkyl sulfonic acids (PFSAs)				
Perfluorobutanesulfonic acid (PFBS)[N11]	0.01	ug/L	< 0.01	< 0.01
Perfluorononanesulfonic acid (PFNS)*[N15]	0.01	ug/L	< 0.01	< 0.01
Perfluoropropanesulfonic acid (PFPrS)*[N15]	0.01	ug/L	< 0.01	< 0.01
Perfluoropentanesulfonic acid (PFPeS)[N15]	0.01	ug/L	< 0.01	< 0.01
Perfluorohexanesulfonic acid (PFHxS)[N11]	0.01	ug/L	< 0.01	< 0.01
Perfluoroheptanesulfonic acid (PFHpS)[N15]	0.01	ug/L	< 0.01	< 0.01
Perfluorooctanesulfonic acid (PFOS)[N11]	0.01	ug/L	< 0.01	< 0.01
Perfluorodecanesulfonic acid (PFDS)[N15]	0.01	ug/L	< 0.01	< 0.01
13C3-PFBS (surr.)	1	%	94	97
18O2-PFHxS (surr.)	1	%	89	90
13C8-PFOS (surr.)	1	%	79	87
PFASs Summations				
Sum (PFHxS + PFOS)*	0.01	ug/L	< 0.01	< 0.01
Sum of PFASs (n=30)*	0.1	ug/L	< 0.1	< 0.1
Sum of US EPA PFAS (PFOS + PFOA)*	0.01	ug/L	< 0.01	< 0.01
Sum of enHealth PFAS (PFHxS + PFOS + PFOA)*	0.01	ug/L	< 0.01	< 0.01
Sum of WA DWER PFAS (n=10)*	0.05	ug/L	< 0.05	< 0.05

Sample History

Where samples are submitted/analysed over several days, the last date of extraction is reported.

If the date and time of sampling are not provided, the Laboratory will not be responsible for compromised results should testing be performed outside the recommended holding time.

Description	Testing Site	Extracted	Holding Time
Perfluoroalkyl carboxylic acids (PFCAs)	Welshpool	May 31, 2024	28 Days
- Method: Method ARL0510_ARL0511 PFAS in aqueous & solid samples by LC-MS/MS			
Perfluoroalkyl sulfonamido substances	Welshpool	May 31, 2024	28 Days
- Method: Method ARL0510_ARL0511 PFAS in aqueous & solid samples by LC-MS/MS			
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)	Welshpool	May 31, 2024	28 Days
- Method: Method ARL0510_ARL0511 PFAS in aqueous & solid samples by LC-MS/MS			
Perfluoroalkyl sulfonic acids (PFSAs)	Welshpool	May 31, 2024	28 Days
- Method: Method ARL0510_ARL0511 PFAS in aqueous & solid samples by LC-MS/MS			
PFASs Summations	Welshpool	May 31, 2024	
- Method: Method ARL0510_ARL0511 PFAS in aqueous & solid samples by LC-MS/MS			

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Project Name: WA_0089_PFASOMP_24
Project ID: WA_0089_PFASOMP_24

Order No.: 304700525/730
Report #: 1102636
Phone: [redacted]
Fax:

Received: May 29, 2024 1:35 PM
Due: Jun 6, 2024
Priority: 5 Day
Contact Name: ALL INVOICES

Eurofins Analytical Services Manager : [redacted]

Sample Detail						Moisture Set	Per- and Polyfluoroalkyl Substances (PFASs)
Perth Laboratory - NATA # 2377 Site # 2370						X	X
External Laboratory							
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**		
1	0089_QC201_240527	May 27, 2024		Water	L24-My0084305		X
2	0089_QC202_240527	May 27, 2024		Water	L24-My0084306		X
3	0089_QC203_240527	May 27, 2024		Water	L24-My0084307		X
4	0089_QC204_240527	May 27, 2024		Water	L24-My0084308		X
5	0089_QC205_240527	May 27, 2024		Water	L24-My0084309		X
6	0089_QC206_240528	May 28, 2024		Water	L24-My0084310		X
7	0089_QC207_240528	May 28, 2024		Soil	L24-My0084311	X	X
8	0089_QC208_240528	May 28, 2024		Water	L24-My0084312		X

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Project Name: WA_0089_PFASOMP_24
Project ID: WA_0089_PFASOMP_24

Order No.: 304700525/730
Report #: 1102636
Phone: [redacted]
Fax:

Received: May 29, 2024 1:35 PM
Due: Jun 6, 2024
Priority: 5 Day
Contact Name: ALL INVOICES

Eurofins Analytical Services Manager : [redacted]

Sample Detail						Moisture Set	Per- and Polyfluoroalkyl Substances (PFASs)
Perth Laboratory - NATA # 2377 Site # 2370						X	X
External Laboratory							
9	0089_QC209_240528	May 28, 2024		Water	L24-My0084313		X
10	0089_QC210_240528	May 28, 2024		Soil	L24-My0084314	X	X
11	0089_QC211_240528	May 28, 2024		Water	L24-My0084315		X
12	0089_QC212_240528	May 28, 2024		Water	L24-My0084316		X
13	0089_QC213_240528	May 28, 2024		Water	L24-My0084317		X
14	0089_QC214_240528	May 28, 2024		Water	L24-My0084318		X
15	0089_QC215_240528	May 28, 2024		Water	L24-My0084319		X
16	0089_QC216_240528	May 28, 2024		Water	L24-My0084320		X
17	0089_QC217_240528	May 28, 2024		Soil	L24-My0084321	X	X

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Order No.: 304700525/730
Report #: 1102636
Phone: [redacted]
Fax:

Received: May 29, 2024 1:35 PM
Due: Jun 6, 2024
Priority: 5 Day
Contact Name: ALL INVOICES

Eurofins Analytical Services Manager : [redacted]

Sample Detail						Moisture Set	Per- and Polyfluoroalkyl Substances (PFASs)
Perth Laboratory - NATA # 2377 Site # 2370						X	X
External Laboratory							
18	0089_QC218_240528	May 28, 2024		Soil	L24-My0084322	X	X
Test Counts						4	18

Internal Quality Control Review and Glossary

General

1. Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples follow guidelines delineated in the National Environment Protection (Assessment of Site Contamination) Measure 1999, as amended May 2013. They are included in this QC report where applicable. Additional QC data may be available on request.
2. Unless otherwise stated, all soil/sediment/solid results are reported on a dry weight basis.
3. Unless otherwise stated, all biota/food results are reported on a wet weight basis on the edible portion.
4. For CEC results where the sample's origin is unknown or environmentally contaminated, the results should be used advisedly.
5. Actual LORs are matrix dependent. Quoted LORs may be raised where sample extracts are diluted due to interferences.
6. Results are uncorrected for matrix spikes or surrogate recoveries except for PFAS compounds where annotated.
7. SVOC analysis on waters is performed on homogenised, unfiltered samples unless noted otherwise.
8. Samples were analysed on an 'as received' basis.
9. Information identified in this report with **blue** colour indicates data provided by customers that may have an impact on the results.
10. This report replaces any interim results previously issued.

Holding Times

Please refer to the 'Sample Preservation and Container Guide' for holding times (QS3001).

For samples received on the last day of holding time, notification of testing requirements should have been received at least 6 hours before sample receipt deadlines as stated on the SRA.

If the Laboratory did not receive the information in the required timeframe, and despite any other integrity issues, suitably qualified results may still be reported.

Holding times apply from the sampling date; therefore, compliance with these may be outside the laboratory's control.

For VOCs containing vinyl chloride, styrene and 2-chloroethyl vinyl ether, the holding time is seven days; however, for all other VOCs, such as BTEX or C6-10 TRH, the holding time is 14 days.

Units

mg/kg: milligrams per kilogram
mg/L: milligrams per litre
ppm: parts per million
µg/L: micrograms per litre
ppb: parts per billion
%: Percentage
org/100 mL: Organisms per 100 millilitres
NTU: Nephelometric Turbidity Units
MPN/100 mL: Most Probable Number of organisms per 100 millilitres
CFU: Colony Forming Unit
Colour: Pt-Co Units (CU)

Terms

APHA	American Public Health Association
CEC	Cation Exchange Capacity
COC	Chain of Custody
CP	Client Parent - QC was performed on samples pertaining to this report
CRM	Certified Reference Material (ISO17034) - reported as percent recovery.
Dry	Where moisture has been determined on a solid sample, the result is expressed on a dry weight basis.
Duplicate	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
LOR	Limit of Reporting.
LCS	Laboratory Control Sample - reported as percent recovery.
Method Blank	In the case of solid samples, these are performed on laboratory-certified clean sands and in the case of water samples, these are performed on de-ionised water.
NCP	Non-Client Parent - QC performed on samples not pertaining to this report, QC represents the sequence or batch that client samples were analysed within.
RPD	Relative Percent Difference between two Duplicate pieces of analysis.
SPIKE	Addition of the analyte to the sample and reported as percentage recovery.
SRA	Sample Receipt Advice
Surr - Surrogate	The addition of a similar compound to the analyte target is reported as percentage recovery. See below for acceptance criteria.
TBTO	Tributyltin oxide (*bis*-tributyltin oxide) - individual tributyltin compounds cannot be identified separately in the environment; however, free tributyltin was measured, and its values were converted stoichiometrically into tributyltin oxide for comparison with regulatory limits.
TCLP	Toxicity Characteristic Leaching Procedure
TEQ	Toxic Equivalency Quotient or Total Equivalence
QSM	US Department of Defense Quality Systems Manual Version 6.0
US EPA	United States Environmental Protection Agency
WA DWER	Sum of PFBA, PFPeA, PFHxA, PFHpA, PFOA, PFBS, PFHxS, PFOS, 6:2 FTSA, 8:2 FTSA

QC - Acceptance Criteria

The acceptance criteria should only be used as a guide and may be different when site-specific Sampling Analysis and Quality Plan (SAQP) have been implemented.

RPD Duplicates: Global RPD Duplicates Acceptance Criteria is ≤30%; however, the following acceptance guidelines are equally applicable:

Results <10 times the LOR:	No Limit
Results between 10-20 times the LOR:	RPD must lie between 0-50%
Results >20 times the LOR:	RPD must lie between 0-30%

NOTE: pH duplicates are reported as a range, not as RPD

Surrogate Recoveries: Recoveries must lie between 20-130% for Speciated Phenols & 50-150% for PFAS. SVOCs recoveries 20 – 150%, VOC recoveries 50 – 150%

PFAS field samples containing surrogate recoveries above the QC limit designated in QSM 6.0, where no positive PFAS results have been reported or reviewed, and no data was affected.

QC Data General Comments

1. Where a result is reported as less than (<), higher than the nominated LOR, this is due to either matrix interference, extract dilution required due to interferences or contaminant levels within the sample, high moisture content or insufficient sample provided.
2. Duplicate data shown within this report that states the word "BATCH" is a Batch Duplicate from outside of your sample batch but within the laboratory sample batch at a 1:10 ratio. The Parent and Duplicate data shown are not data from your samples.
3. pH and Free Chlorine analysed in the laboratory - Analysis on this test must begin within 30 minutes of sampling. Therefore, laboratory analysis is unlikely to be completed within holding time.Analysis will begin as soon as possible after sample receipt.
4. Recovery Data (Spikes & Surrogates) - where chromatographic interference does not allow the determination of recovery, the term "INT" appears against that analyte.
5. For Matrix Spikes and LCS results, a dash "-" in the report means that the specific analyte was not added to the QC sample.
6. Duplicate RPDs are calculated from raw analytical data; thus, it is possible to have two sets of data.

Quality Control Results

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Method Blank							
Perfluoroalkyl carboxylic acids (PFCAs)							
Perfluorobutanoic acid (PFBA)	ug/L	< 0.05			0.05	Pass	
Perfluoropentanoic acid (PFPeA)	ug/L	< 0.01			0.01	Pass	
Perfluorohexanoic acid (PFHxA)	ug/L	< 0.01			0.01	Pass	
Perfluoroheptanoic acid (PFHpA)	ug/L	< 0.05			0.05	Pass	
Perfluorooctanoic acid (PFOA)	ug/L	< 0.01			0.01	Pass	
Perfluorononanoic acid (PFNA)	ug/L	< 0.01			0.01	Pass	
Perfluorodecanoic acid (PFDA)	ug/L	< 0.01			0.01	Pass	
Perfluoroundecanoic acid (PFUnDA)	ug/L	< 0.01			0.01	Pass	
Perfluorododecanoic acid (PFDoDA)	ug/L	< 0.01			0.01	Pass	
Perfluorotridecanoic acid (PFTrDA)	ug/L	< 0.01			0.01	Pass	
Perfluorotetradecanoic acid (PFTeDA)	ug/L	< 0.01			0.01	Pass	
Method Blank							
Perfluoroalkyl sulfonamido substances							
Perfluorooctane sulfonamide (FOSA)	ug/L	< 0.05			0.05	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	ug/L	< 0.05			0.05	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	ug/L	< 0.05			0.05	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)	ug/L	< 0.05			0.05	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)	ug/L	< 0.05			0.05	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	ug/L	< 0.05			0.05	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	ug/L	< 0.05			0.05	Pass	
Method Blank							
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)							
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	ug/L	< 0.01			0.01	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)	ug/L	< 0.05			0.05	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	ug/L	< 0.01			0.01	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	ug/L	< 0.01			0.01	Pass	
Method Blank							
Perfluoroalkyl sulfonic acids (PFSAs)							
Perfluorobutanesulfonic acid (PFBS)	ug/L	< 0.01			0.01	Pass	
Perfluorononanesulfonic acid (PFNS)*	ug/L	< 0.01			0.01	Pass	
Perfluoropropanesulfonic acid (PFPrS)*	ug/L	< 0.01			0.01	Pass	
Perfluoropentanesulfonic acid (PFPeS)	ug/L	< 0.01			0.01	Pass	
Perfluorohexanesulfonic acid (PFHxS)	ug/L	< 0.01			0.01	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	ug/L	< 0.01			0.01	Pass	
Perfluorooctanesulfonic acid (PFOS)	ug/L	< 0.01			0.01	Pass	
Perfluorodecanesulfonic acid (PFDS)	ug/L	< 0.01			0.01	Pass	
Method Blank							
Perfluoroalkyl carboxylic acids (PFCAs)							
Perfluorobutanoic acid (PFBA)	ug/L	< 0.05			0.05	Pass	
Perfluoropentanoic acid (PFPeA)	ug/L	< 0.01			0.01	Pass	
Perfluorohexanoic acid (PFHxA)	ug/L	< 0.01			0.01	Pass	
Perfluoroheptanoic acid (PFHpA)	ug/L	< 0.05			0.05	Pass	
Perfluorooctanoic acid (PFOA)	ug/L	< 0.01			0.01	Pass	
Perfluorononanoic acid (PFNA)	ug/L	< 0.01			0.01	Pass	
Perfluorodecanoic acid (PFDA)	ug/L	< 0.01			0.01	Pass	
Perfluoroundecanoic acid (PFUnDA)	ug/L	< 0.01			0.01	Pass	
Perfluorododecanoic acid (PFDoDA)	ug/L	< 0.01			0.01	Pass	
Perfluorotridecanoic acid (PFTrDA)	ug/L	< 0.01			0.01	Pass	
Perfluorotetradecanoic acid (PFTeDA)	ug/L	< 0.01			0.01	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Method Blank							
Perfluoroalkyl sulfonamido substances							
Perfluorooctane sulfonamide (FOSA)	ug/L	< 0.05			0.05	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	ug/L	< 0.05			0.05	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	ug/L	< 0.05			0.05	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)	ug/L	< 0.05			0.05	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)	ug/L	< 0.05			0.05	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	ug/L	< 0.05			0.05	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	ug/L	< 0.05			0.05	Pass	
Method Blank							
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)							
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	ug/L	< 0.01			0.01	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)	ug/L	< 0.05			0.05	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	ug/L	< 0.01			0.01	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	ug/L	< 0.01			0.01	Pass	
Method Blank							
Perfluoroalkyl sulfonic acids (PFSAs)							
Perfluorobutanesulfonic acid (PFBS)	ug/L	< 0.01			0.01	Pass	
Perfluorononanesulfonic acid (PFNS)*	ug/L	< 0.01			0.01	Pass	
Perfluoropropanesulfonic acid (PFPrS)*	ug/L	< 0.01			0.01	Pass	
Perfluoropentanesulfonic acid (PFPeS)	ug/L	< 0.01			0.01	Pass	
Perfluorohexanesulfonic acid (PFHxS)	ug/L	< 0.01			0.01	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	ug/L	< 0.01			0.01	Pass	
Perfluorooctanesulfonic acid (PFOS)	ug/L	< 0.01			0.01	Pass	
Perfluorodecanesulfonic acid (PFDS)	ug/L	< 0.01			0.01	Pass	
Method Blank							
Perfluoroalkyl carboxylic acids (PFCAs)							
Perfluorobutanoic acid (PFBA)	ug/L	< 0.05			0.05	Pass	
Perfluoropentanoic acid (PFPeA)	ug/L	< 0.01			0.01	Pass	
Perfluorohexanoic acid (PFHxA)	ug/L	< 0.01			0.01	Pass	
Perfluoroheptanoic acid (PFHpA)	ug/L	< 0.05			0.05	Pass	
Perfluorooctanoic acid (PFOA)	ug/L	< 0.01			0.01	Pass	
Perfluorononanoic acid (PFNA)	ug/L	< 0.01			0.01	Pass	
Perfluorodecanoic acid (PFDA)	ug/L	< 0.01			0.01	Pass	
Perfluoroundecanoic acid (PFUnDA)	ug/L	< 0.01			0.01	Pass	
Perfluorododecanoic acid (PFDoDA)	ug/L	< 0.01			0.01	Pass	
Perfluorotridecanoic acid (PFTrDA)	ug/L	< 0.01			0.01	Pass	
Perfluorotetradecanoic acid (PFTeDA)	ug/L	< 0.01			0.01	Pass	
Method Blank							
Perfluoroalkyl sulfonamido substances							
Perfluorooctane sulfonamide (FOSA)	ug/L	< 0.05			0.05	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	ug/L	< 0.05			0.05	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	ug/L	< 0.05			0.05	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)	ug/L	< 0.05			0.05	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)	ug/L	< 0.05			0.05	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	ug/L	< 0.05			0.05	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	ug/L	< 0.05			0.05	Pass	
Method Blank							
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)							
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	ug/L	< 0.01			0.01	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)	ug/L	< 0.05			0.05	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	ug/L	< 0.01			0.01	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	ug/L	< 0.01			0.01	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Method Blank							
Perfluoroalkyl sulfonic acids (PFSAs)							
Perfluorobutanesulfonic acid (PFBS)	ug/L	< 0.01			0.01	Pass	
Perfluorononanesulfonic acid (PFNS)*	ug/L	< 0.01			0.01	Pass	
Perfluoropropanesulfonic acid (PFPrS)*	ug/L	< 0.01			0.01	Pass	
Perfluoropentanesulfonic acid (PFPeS)	ug/L	< 0.01			0.01	Pass	
Perfluorohexanesulfonic acid (PFHxS)	ug/L	< 0.01			0.01	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	ug/L	< 0.01			0.01	Pass	
Perfluorooctanesulfonic acid (PFOS)	ug/L	< 0.01			0.01	Pass	
Perfluorodecanesulfonic acid (PFDS)	ug/L	< 0.01			0.01	Pass	
LCS - % Recovery							
Perfluoroalkyl carboxylic acids (PFCAs)							
Perfluorobutanoic acid (PFBA)	%	96			50-150	Pass	
Perfluoropentanoic acid (PFPeA)	%	90			50-150	Pass	
Perfluorohexanoic acid (PFHxA)	%	86			50-150	Pass	
Perfluoroheptanoic acid (PFHpA)	%	100			50-150	Pass	
Perfluorooctanoic acid (PFOA)	%	88			50-150	Pass	
Perfluorononanoic acid (PFNA)	%	88			50-150	Pass	
Perfluorodecanoic acid (PFDA)	%	94			50-150	Pass	
Perfluoroundecanoic acid (PFUnDA)	%	90			50-150	Pass	
Perfluorododecanoic acid (PFDoDA)	%	88			50-150	Pass	
Perfluorotridecanoic acid (PFTrDA)	%	108			50-150	Pass	
Perfluorotetradecanoic acid (PFTeDA)	%	90			50-150	Pass	
LCS - % Recovery							
Perfluoroalkyl sulfonamido substances							
Perfluorooctane sulfonamide (FOSA)	%	84			50-150	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	%	92			50-150	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	%	90			50-150	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)	%	86			50-150	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)	%	92			50-150	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	%	78			50-150	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	%	86			50-150	Pass	
LCS - % Recovery							
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)							
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	%	100			50-150	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)	%	116			50-150	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	%	92			50-150	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	%	88			50-150	Pass	
LCS - % Recovery							
Perfluoroalkyl sulfonic acids (PFSAs)							
Perfluorobutanesulfonic acid (PFBS)	%	90			50-150	Pass	
Perfluorononanesulfonic acid (PFNS)*	%	56			50-150	Pass	
Perfluoropropanesulfonic acid (PFPrS)*	%	98			50-150	Pass	
Perfluoropentanesulfonic acid (PFPeS)	%	104			50-150	Pass	
Perfluorohexanesulfonic acid (PFHxS)	%	92			50-150	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	%	120			50-150	Pass	
Perfluorooctanesulfonic acid (PFOS)	%	96			50-150	Pass	
Perfluorodecanesulfonic acid (PFDS)	%	54			50-150	Pass	
LCS - % Recovery							
Perfluoroalkyl carboxylic acids (PFCAs)							
Perfluorobutanoic acid (PFBA)	%	108			50-150	Pass	
Perfluoropentanoic acid (PFPeA)	%	104			50-150	Pass	
Perfluorohexanoic acid (PFHxA)	%	88			50-150	Pass	
Perfluoroheptanoic acid (PFHpA)	%	108			50-150	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Perfluorooctanoic acid (PFOA)	%	92			50-150	Pass	
Perfluorononanoic acid (PFNA)	%	92			50-150	Pass	
Perfluorodecanoic acid (PFDA)	%	104			50-150	Pass	
Perfluoroundecanoic acid (PFUnDA)	%	100			50-150	Pass	
Perfluorododecanoic acid (PFDoDA)	%	100			50-150	Pass	
Perfluorotridecanoic acid (PFTrDA)	%	112			50-150	Pass	
Perfluorotetradecanoic acid (PFTeDA)	%	96			50-150	Pass	
LCS - % Recovery							
Perfluoroalkyl sulfonamido substances							
Perfluorooctane sulfonamide (FOSA)	%	88			50-150	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	%	104			50-150	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	%	100			50-150	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)	%	92			50-150	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)	%	104			50-150	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	%	96			50-150	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	%	100			50-150	Pass	
LCS - % Recovery							
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)							
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	%	100			50-150	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)	%	128			50-150	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	%	104			50-150	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	%	100			50-150	Pass	
LCS - % Recovery							
Perfluoroalkyl sulfonic acids (PFSAs)							
Perfluorobutanesulfonic acid (PFBS)	%	96			50-150	Pass	
Perfluorononanesulfonic acid (PFNS)*	%	72			50-150	Pass	
Perfluoropropanesulfonic acid (PFPrS)*	%	116			50-150	Pass	
Perfluoropentanesulfonic acid (PFPeS)	%	116			50-150	Pass	
Perfluorohexanesulfonic acid (PFHxS)	%	92			50-150	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	%	104			50-150	Pass	
Perfluorooctanesulfonic acid (PFOS)	%	92			50-150	Pass	
Perfluorodecanesulfonic acid (PFDS)	%	68			50-150	Pass	
LCS - % Recovery							
Perfluoroalkyl carboxylic acids (PFCAs)							
Perfluorobutanoic acid (PFBA)	%	71			50-150	Pass	
Perfluoropentanoic acid (PFPeA)	%	87			50-150	Pass	
Perfluorohexanoic acid (PFHxA)	%	77			50-150	Pass	
Perfluoroheptanoic acid (PFHpA)	%	91			50-150	Pass	
Perfluorooctanoic acid (PFOA)	%	84			50-150	Pass	
Perfluorononanoic acid (PFNA)	%	82			50-150	Pass	
Perfluorodecanoic acid (PFDA)	%	88			50-150	Pass	
Perfluoroundecanoic acid (PFUnDA)	%	85			50-150	Pass	
Perfluorododecanoic acid (PFDoDA)	%	84			50-150	Pass	
Perfluorotridecanoic acid (PFTrDA)	%	95			50-150	Pass	
Perfluorotetradecanoic acid (PFTeDA)	%	82			50-150	Pass	
LCS - % Recovery							
Perfluoroalkyl sulfonamido substances							
Perfluorooctane sulfonamide (FOSA)	%	78			50-150	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	%	84			50-150	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	%	83			50-150	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)	%	83			50-150	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)	%	79			50-150	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	%	82			50-150	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	%	85			50-150	Pass	
LCS - % Recovery							
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)							
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	%	92			50-150	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)	%	123			50-150	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	%	90			50-150	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	%	87			50-150	Pass	
LCS - % Recovery							
Perfluoroalkyl sulfonic acids (PFSAs)							
Perfluorobutanesulfonic acid (PFBS)	%	83			50-150	Pass	
Perfluorononanesulfonic acid (PFNS)*	%	69			50-150	Pass	
Perfluoropropanesulfonic acid (PFPrS)*	%	91			50-150	Pass	
Perfluoropentanesulfonic acid (PFPeS)	%	93			50-150	Pass	
Perfluorohexanesulfonic acid (PFHxS)	%	89			50-150	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	%	84			50-150	Pass	
Perfluorooctanesulfonic acid (PFOS)	%	81			50-150	Pass	
Perfluorodecanesulfonic acid (PFDS)	%	74			50-150	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Spike - % Recovery									
Perfluoroalkyl carboxylic acids (PFCAs)				Result 1					
Perfluorobutanoic acid (PFBA)	L24-My0084306	CP	%	71			50-150	Pass	
Perfluoropentanoic acid (PFPeA)	L24-My0084306	CP	%	90			50-150	Pass	
Perfluorohexanoic acid (PFHxA)	L24-My0084306	CP	%	87			50-150	Pass	
Perfluoroheptanoic acid (PFHpA)	L24-My0084306	CP	%	93			50-150	Pass	
Perfluorooctanoic acid (PFOA)	L24-My0084306	CP	%	94			50-150	Pass	
Perfluorononanoic acid (PFNA)	L24-My0084306	CP	%	92			50-150	Pass	
Perfluorodecanoic acid (PFDA)	L24-My0084306	CP	%	99			50-150	Pass	
Perfluoroundecanoic acid (PFUnDA)	L24-My0084306	CP	%	96			50-150	Pass	
Perfluorododecanoic acid (PFDoDA)	L24-My0084306	CP	%	95			50-150	Pass	
Perfluorotridecanoic acid (PFTrDA)	L24-My0084306	CP	%	124			50-150	Pass	
Perfluorotetradecanoic acid (PFTeDA)	L24-My0084306	CP	%	88			50-150	Pass	
Spike - % Recovery									
Perfluoroalkyl sulfonamido substances				Result 1					
Perfluorooctane sulfonamide (FOSA)	L24-My0084306	CP	%	88			50-150	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	L24-My0084306	CP	%	86			50-150	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	L24-My0084306	CP	%	86			50-150	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)	L24-My0084306	CP	%	84			50-150	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)	L24-My0084306	CP	%	88			50-150	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	L24-My0084306	CP	%	86			50-150	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	L24-My0084306	CP	%	89			50-150	Pass	
Spike - % Recovery									
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)				Result 1					
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	L24-My0084306	CP	%	99			50-150	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)	L24-My0084306	CP	%	95			50-150	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	L24-My0084306	CP	%	107			50-150	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	L24-My0084306	CP	%	104			50-150	Pass	
Spike - % Recovery									
Perfluoroalkyl sulfonic acids (PFSAs)				Result 1					
Perfluorobutanesulfonic acid (PFBS)	L24-My0084306	CP	%	128			50-150	Pass	
Perfluorononanesulfonic acid (PFNS)*	L24-My0084306	CP	%	57			50-150	Pass	
Perfluoropropanesulfonic acid (PFPrS)*	L24-My0084306	CP	%	90			50-150	Pass	
Perfluoropentanesulfonic acid (PFPeS)	L24-My0084306	CP	%	124			50-150	Pass	
Perfluorohexanesulfonic acid (PFHxS)	L24-My0084306	CP	%	86			50-150	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	L24-My0084306	CP	%	113			50-150	Pass	
Perfluorooctanesulfonic acid (PFOS)	L24-My0084306	CP	%	67			50-150	Pass	
Perfluorodecanesulfonic acid (PFDS)	L24-My0084306	CP	%	58			50-150	Pass	
Test	**Lab Sample ID**	**QA Source**	**Units**	**Result 1**			**Acceptance Limits**	**Pass Limits**	**Qualifying Code**
Duplicate									
Perfluoroalkyl carboxylic acids (PFCAs)				Result 1	Result 2	RPD			
Perfluorobutanoic acid (PFBA)	L24-My0084305	CP	ug/L	0.15	0.16	7.5	30%	Pass	
Perfluoropentanoic acid (PFPeA)	L24-My0084305	CP	ug/L	0.52	0.52	<1	30%	Pass	
Perfluorohexanoic acid (PFHxA)	L24-My0084305	CP	ug/L	0.50	0.54	8.9	30%	Pass	
Perfluoroheptanoic acid (PFHpA)	L24-My0084305	CP	ug/L	0.24	0.25	2.8	30%	Pass	
Perfluorooctanoic acid (PFOA)	L24-My0084305	CP	ug/L	0.30	0.31	1.4	30%	Pass	
Perfluorononanoic acid (PFNA)	L24-My0084305	CP	ug/L	0.06	0.06	3.5	30%	Pass	
Perfluorodecanoic acid (PFDA)	L24-My0084305	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluoroundecanoic acid (PFUnDA)	L24-My0084305	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorododecanoic acid (PFDoDA)	L24-My0084305	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorotridecanoic acid (PFTrDA)	L24-My0084305	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorotetradecanoic acid (PFTeDA)	L24-My0084305	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Duplicate									
Perfluoroalkyl sulfonamido substances				Result 1	Result 2	RPD			
Perfluorooctane sulfonamide (FOSA)	L24-My0084305	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	L24-My0084305	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	L24-My0084305	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)	L24-My0084305	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)	L24-My0084305	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	L24-My0084305	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	L24-My0084305	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	

Duplicate									
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)				Result 1	Result 2	RPD			
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	L24-My0084305	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)	L24-My0084305	CP	ug/L	0.12	0.12	<1	30%	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	L24-My0084305	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	L24-My0084305	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Duplicate									
Perfluoroalkyl sulfonic acids (PFSAs)				Result 1	Result 2	RPD			
Perfluorobutanesulfonic acid (PFBS)	L24-My0084305	CP	ug/L	0.12	0.12	1.9	30%	Pass	
Perfluorononanesulfonic acid (PFNS)*	L24-My0084305	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluoropropanesulfonic acid (PFPrS)*	L24-My0084305	CP	ug/L	0.04	0.03	12	30%	Pass	
Perfluoropentanesulfonic acid (PFPeS)	L24-My0084305	CP	ug/L	0.07	0.08	7.5	30%	Pass	
Perfluorohexanesulfonic acid (PFHxS)	L24-My0084305	CP	ug/L	3.3	3.3	<1	30%	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	L24-My0084305	CP	ug/L	1.1	1.1	5.1	30%	Pass	
Perfluorooctanesulfonic acid (PFOS)	L24-My0084305	CP	ug/L	13	12	7.4	30%	Pass	
Perfluorodecanesulfonic acid (PFDS)	L24-My0084305	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Duplicate									
Perfluoroalkyl carboxylic acids (PFCAs)				Result 1	Result 2	RPD			
Perfluorobutanoic acid (PFBA)	L24-My0084320	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
Perfluoropentanoic acid (PFPeA)	L24-My0084320	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorohexanoic acid (PFHxA)	L24-My0084320	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluoroheptanoic acid (PFHpA)	L24-My0084320	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
Perfluorooctanoic acid (PFOA)	L24-My0084320	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorononanoic acid (PFNA)	L24-My0084320	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorodecanoic acid (PFDA)	L24-My0084320	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluoroundecanoic acid (PFUnDA)	L24-My0084320	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorododecanoic acid (PFDoDA)	L24-My0084320	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorotridecanoic acid (PFTrDA)	L24-My0084320	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorotetradecanoic acid (PFTeDA)	L24-My0084320	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Duplicate									
Perfluoroalkyl sulfonamido substances				Result 1	Result 2	RPD			
Perfluorooctane sulfonamide (FOSA)	L24-My0084320	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	L24-My0084320	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	L24-My0084320	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)	L24-My0084320	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)	L24-My0084320	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	L24-My0084320	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	L24-My0084320	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	

Duplicate									
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)				Result 1	Result 2	RPD			
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	L24-My0084320	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)	L24-My0084320	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	L24-My0084320	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	L24-My0084320	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Duplicate									
Perfluoroalkyl sulfonic acids (PFSAs)				Result 1	Result 2	RPD			
Perfluorobutanesulfonic acid (PFBS)	L24-My0084320	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorononanesulfonic acid (PFNS)*	L24-My0084320	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluoropropanesulfonic acid (PFPrS)*	L24-My0084320	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluoropentanesulfonic acid (PFPeS)	L24-My0084320	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorohexanesulfonic acid (PFHxS)	L24-My0084320	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	L24-My0084320	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorooctanesulfonic acid (PFOS)	L24-My0084320	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorodecanesulfonic acid (PFDS)	L24-My0084320	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	

Comments

Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	Yes
Sample correctly preserved	Yes
Appropriate sample containers have been used	Yes
Sample containers for volatile analysis received with minimal headspace	N/A
Samples received within HoldingTime	Yes
Some samples have been subcontracted	No

Qualifier Codes/Comments

Code	Description
N09	Quantification of linear and branched isomers has been conducted as a single total response using the relative response factor for the corresponding linear/branched standard.
N11	Isotope dilution is used for calibration of each native compound for which an exact labelled analogue is available (Isotope Dilution Quantitation). The isotopically labelled analogues allow identification and recovery correction of the concentration of the associated native PFAS compounds.
N15	Where the native PFAS compound does not have labelled analogue then the quantification is made using the Extracted Internal Standard Analyte with the closest retention time to the analyte and no recovery correction has been made (Internal Standard Quantitation).

Authorised by:

[redacted] Analytical Services Manager

[redacted] Senior Analyst-PFAS

[redacted]

General Manager

- Indicates Not Requested

* Indicates NATA accreditation does not cover the performance of this service

Measurement uncertainty of test data is available on request

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APPENDIX

D

FIELD RECORDS & CALIBRATION CERTIFICATES

Cardno

now

Stantec

Monitoring Date	Monitoring Location	Sample_ID	Screen Interval (m)	TOC (mAHD)	Borelog Well Depth (m)	Actual Well Depth (mbTOC)	SWL (mbTOC)	RWL (mAHD)	Observations	Sampling Method	Temp (°C)	DO (mg/L)	EC (us/Cm)	TDS (mg/L)	pH	Eh (mV)	QC Dup Sample #	Odour Comments	colour
29/05/2024	MW010	0089_MW010_240529	NA	4.167	9.2	8.5	3.816	0.351		HydraSleeve	16.9	4.88	800	615	7.26	21.8			Clear
29/05/2024	MW109	0089_MW109_240529	2.5-5.5_	4.446	5.5	5.5	3.9	0.546		HydraSleeve	19.6	0.29	1228	798	7.38	-202		Hydrogen sulfide	Cloudy
29/05/2024	MW112	0089_MW112_240529	3.0 - 6.0	3.973	6.0	6	3.27	0.703		HydraSleeve	20.3	0.85	591	384.1	7.5	31.9			Clear
29/05/2024	MW120	0089_MW120_240529	2.5-5.5_	4.409	5.5	5.5	3.82	0.589		HydraSleeve	18.4	0.49	619	402.6	7.6	21.3			Brown
29/05/2024	MW121	0089_MW121_240529	2.7-5.7_	3.7	5.7	3.7	3.1	0.6		HydraSleeve	20.5	2.29	649	421.7	7.74	6.7			Clear
29/05/2024	MW123	0089_MW123_240529	4.5-8_	6.62	8.0	7.85	6.2	0.42		HydraSleeve	18	1.35	788	512	7.59	-9.9			Clear
29/05/2024	MW124	0089_MW124_240529	0.75-4_	1.899	4.0	4	1.27	0.629		HydraSleeve	18.7	0.34	41234	26800	7.16	-204.1		Hydrogen sulfide	Clear
29/05/2024	MW125	0089_MW125_240529	0.9-3.9_	1.882	3.9	3.9	1.32	0.562		HydraSleeve	19.4	0.27	43409	28214	7.04	263.3			Clear
29/05/2024	MW126	0089_MW126_240529	0.9-3.9_	1.948	3.9	3.9	1.37	0.578		HydraSleeve	19.5	0.78	37872	24614	6.96	-264.2			Clear
29/05/2024	MW127	0089_MW127_240529	0.9-3.9_	1.771	3.9	3.3	1.32	0.451		HydraSleeve	18.6	2.67	36689	23847	7.12	-236.4			Clear
29/05/2024	MW128	0089_MW128_240529	2.5-5.5_	4.537	5.5	5.5	4.06	0.477		HydraSleeve	18	1.69	1749	1135	7.7	-84.7			Cloudy
28/05/2024	MW139	0089_MW139_240528	2-5_	2.273	5.0	4.832	1.945	0.328		HydraSleeve	20.9	2.04	19363	12587	7.23	-120.8	QC108/208		
28/05/2024	MW141	0089_MW141_240528	2-5_	3.025	5.0	5.219	2.662	0.363		HydraSleeve	20	1.13	34533	22448	6.93	-200.4			
28/05/2024	MW142	0089_MW142_240528	0.25-4_	2.573	4.0	3.793	2.251	0.322		HydraSleeve	21	2.73	41275	26850	7.08	-122.9			
28/05/2024	MW147	0089_MW147_240528	2-5_	3.423	5.2	5.498	3.023	0.4		HydraSleeve	19.6	2.52	27068	17593	7.12	-188.7			
28/05/2024	MW149	0089_MW149_240528	1-4_	2.303	4.0	4.409	1.915	0.388		HydraSleeve	20.9	2.67	47767	31050	7.14	-124.2			
27/05/2024	MW158	0089_MW158_240527	NA	14.541	15.82	14.55	14.01	0.531		HydraSleeve	19.2	0.74	8486	6227	7.32	528			Clear
27/05/2024	MW161		NA	17.225	18.13	12.44			Dry										
27/05/2024	MW166	0089_MW166_240527	10-13_	11.89	13.0	12.23	11.03	0.86		HydraSleeve	18.3	1.43	4282	3192	7.38	17.9	QC101/201		Cloudy
27/05/2024	MW171	0089_MW171_240527	28.5-31.5_	29.238	31.5	31.5	28.57	0.668		HydraSleeve	19.3	1.53	4853	3541	7.5	7.1			Clear
27/05/2024	MW172	0089_MW172_240527	-0_	16.772	26.0	17.3	16.23	0.542		HydraSleeve	19.2	1.42	3902	2850	7.59	-5.9	QC104/204		Clear
27/05/2024	MW173	0089_MW173_240527	NA	10.08	11.11	11.349	9.19	0.89		HydraSleeve	21.9	3.64	3492	2040.5	7.45	52.1			
27/05/2024	MW193	0089_MW193_240527	10.5-13.5_	11.86	13.5	12.452	9.382	2.478		HydraSleeve	20.5	5.79	6437	3877.5	7.69	59.7	QC105/205		
27/05/2024	MW195D	0089_MW195D_240527	10-13_	4.363	13.0	16.672	3.772	0.591		HydraSleeve	20.7	1.58	53365	31955	7.64	-57.9	QC102/202		
27/05/2024	MW195S	0089_MW195S_240527	3.5-6.5_	4.571	6.5	7.815	3.982	0.589		HydraSleeve	21.2	4.29	9089	6390	7.39	0.8	QC103/203		
29/05/2024	MW196		NA	12.75	13.8	12.37			Dry										
29/05/2024	MW199	0089_MW199_240529	NA	11.8	NA	17.645	11.675	0.125		HydraSleeve	18.4	2.51	16286	10587	7.25	-145.6			
29/05/2024	MW200	0089_MW200_240529	NA	2.07	NA	2.127	1.882	0.188		HydraSleeve	20.6	5.65	10261	6667	7.54	87			
29/05/2024	MW202	0089_MW202_240529	NA	2.12	NA	2.935	1.533	0.587		HydraSleeve	20.1	0.84	1722	1121	7.57	-46.2			
29/05/2024	MW203	0089_MW203_240529	NA	10.855	12.9	12.866	10.552	0.303		HydraSleeve	21.4	5.01	1833	1191	7.33	-49.9			
28/05/2024	MW214	0089_MW214_240528	5.5-9_	8.075	9.0	9.1	7.415	0.66		HydraSleeve	18.6	3.54	3192	2363	7.25	-15			Cloudy
28/05/2024	MW215	0089_MW215_240528	1.5-4.5_	3.794	4.5	4.8	3.245	0.549		HydraSleeve	18.9	1.11	2577	1897	7.44	-41.4		Sewage odour	Black,Cloudy
28/05/2024	MW216	0089_MW216_240528	6-9_	8.329	6.0	9.5	7.669	0.66		HydraSleeve	18.3	3.9	2262	1687	7.48	5.5			Clear
28/05/2024	MW217	0089_MW217_240528	6.5-9.5_	8.847	9.5	9	8.3	0.547		HydraSleeve	18.8	1.37	1222	902	7.8	-10			Cloudy
28/05/2024	MW220	0089_MW220_240528		7.054		7	6.568	0.486		HydraSleeve	18.4	1.72	611	4543	7.94	-30.1			Cloudy
28/05/2024	MW224	0089_MW224_240528	11.25-14.25_	13.372	14.25	14.25	12.945	0.427	Not enough water for field readings	HydraSleeve									
28/05/2024	MW225	0089_MW225_240528	2-5_	4.066	5.0	5.45	3.62	0.446		HydraSleeve	17.9	1.46	2691	2022	7.39	-199.1		H2S	Cloudy
28/05/2024	MW226	0089_MW226_240528	0.75-3.8_	1.749	3.8	3.78	1.2	0.549		HydraSleeve	20.1	0.97	40617	26425	7.16	-64.9			Brown
28/05/2024	MW227	0089_MW227_240528	1.25-4.2_	2.961	4.2	4.2	2.6	0.361		HydraSleeve	19.2	0.9	6047	3930	7.38	-267.1		Hydrogen sulfide	Brown
28/05/2024	MW228	0089_MW228_240528	0.75-3.75_	2.23	3.75	3.75	1.9	0.33		HydraSleeve	18.6	1.34	13809	8975	7.5	62.4	QC106/206		Clear
29/05/2024	MW233	0089_MW233_240529	NA	3.705	4.968	4.271	2.993	0.712		HydraSleeve	18.1	3.69	285.5	185.7	8.27	-113.8			
29/05/2024	MW236	0089_MW236_240529	NA	4.642	5.66	4.07	4.03	0.612	Dry	HydraSleeve									
29/05/2024	MW238	0089_MW238_240529	NA	4.827	NA	5.94	4.44	0.387		HydraSleeve	19.3	4.43	561	408	7.78	-14.3			Clear
29/05/2024	MW239	0089_MW239_240529	NA	4.03	NA	5.1	3.66	0.37		HydraSleeve	20.2	4.22	576	412.6	7.76	-3.6			Cloudy
29/05/2024	MW240	0089_MW240_240529	NA	4.483	6.8	6.81	4.07	0.413		HydraSleeve	19.2	4.2	627	458	7.55	-3.1			Clear
29/05/2024	MW242		NA	3.539	4.76		3.62	-0.081	Blocked at 3.80, not sampled										
29/05/2024	MW243	0089_MW243_240529	NA	4.892	7.0	7	4.47	0.422		HydraSleeve	16.2	5.62	603	471	7.7	-6			Cloudy
29/05/2024	MW245	0089_MW245_240529	NA	4.551	5.65	5.5	4.035	0.516		HydraSleeve	17.3	5.44	351.6	267.4	8.11	-5			Clear
29/05/2024	MW249	0089_MW249_240529	3.5-6.5_	5.227	6.5	6.28	4.925	0.302		HydraSleeve	18.9	3.58	1041	766	7.4	-25.3			Clear
28/05/2024	MW255	0089_MW255_240528	3-6_	4.609	6.0	6.34	4.06	0.549		HydraSleeve	20.4	2.69	805	575	7.71	-0.4			
28/05/2024	MW256	0089_MW256_240528	3-6_	3.84	6.0	5.68	3.276	0.564		HydraSleeve	20	3.2	2416	1736	7.39	-144.4		Stagnant	Cloudy
28/05/2024	MW257	0089_MW257_240528	2.7-5.7_	3.806	5.7	5.32	3.26	0.546		HydraSleeve	21	3.16	532	374.5	7.89	15			Clear
28/05/2024	MW258	0089_MW258_240528	3-6_	4.043	6.0	5.45	3.505	0.538		HydraSleeve	21.2	2.5	1270	889	7.41	24.9			Cloudy
28/05/2024	MW259	0089_MW259_240528	2.5-5.5_	3.8	5.5	5.38	3.255	0.545		HydraSleeve	19.1	2.38	718	526	7.49	-59.7			Cloudy
28/05/2024	MW268	0089_MW268_240528	2.5-5.5_	4.056	5.5	5.5	3.6	0.456		HydraSleeve	21.3	0.48	6918	4472	7.29	27.9			Clear
29/05/2024	MW269	0089_MW269_240529	2.5-5.5_	4.153	5.5	6	3.75	0.403		HydraSleeve	17.6	3.96	1115	844	7.48	-16.2			Clear
28/05/2024	MW282		4.5-7.5_	5.78		5.3			Dry										
28/05/2024	MW288	0089_MW288_240528	2.25-5.25_	4.003	5.25	5.12	3.6	0.403		HydraSleeve	20.7	0.84	548	355.5	7.61	-58.8			Clear
29/05/2024	MW289	0089_MW289_240529	3.25-6.25_	4.495	6.25	6.014	4.862	-0.367		HydraSleeve	21.3	5.05	1127	733	7.34	36.7			Clear
29/05/2024	MW468	0089_MW468_240529	0-1.2	NA	NA	2.514	2.053		temporary beach well - not surveyed	HydraSleeve	20.3	2.98	21913	13913	7.2	118.7			Clear
29/05/2024	MW496	0089_MW496_240529	3.5-8_	5.092	8.0	8.2	4.71	0.382		HydraSleeve	18.6	3.52	1072	795	7.54	-141.5			Clear
29/05/2024	MW500	0089_MW500_240529	2-6.5_	3.692	6.5	6.2	3.1	0.592		HydraSleeve	20.3	0.52	932	606	7.14	-62.4			Clear
29/05/2024	MW516	0089_MW516_240529	4.5-7.5_	6.37	7.5	8	5.995	0.375		HydraSleeve	18.6	4.19	903	670	7.35	-4.5			Clear
29/05/2024	MW553	0089_MW553_240529	3-6_	3.799	6.0	5.79	3.425	0.374		HydraSleeve	17	5.74	918	704	7.24	3.6			Clear

Monitoring Date	Monitoring Location	Sample_ID	Sampling Method	Temp (°C)	DO (mg/L)	EC (us/Cm)	TDS (mg/L)	pH	Eh (mV)	QC Dup Sample #	Odour ?	colour
29/05/2024	PW304	0089_PW304_240529	Perilstatic Pump	17.7	5.77	50037	32531	7.62	64		no	Clear
28/05/2024	PW306	0089_PW306_240528	Perilstatic Pump	16	4.32	53040	34800	7.55	54.5		no	Clear
28/05/2024	PW307	0089_PW307_240528	Perilstatic Pump	15.8	4.87	53400	33900	7.55	54.8	QC111/211	no	Clear
28/05/2024	PW308	0089_PW308_240528	Perilstatic Pump	16	4.58	54204	33480	7.55	48		no	Clear
28/05/2024	PW314	0089_PW314_240528	Perilstatic Pump	15.9	4.2	53028	33900	7.55	58.2		no	Clear
28/05/2024	PW315	0089_PW315_240528	Perilstatic Pump	16	4.1	53040	34750	7.5	50.3		no	Clear
28/05/2024	PW316	0089_PW316_240528	Perilstatic Pump	16	4.51	54008	34503	7.49	60.1		no	Clear
28/05/2024	PW329	0089_PW329_240528	Perilstatic Pump	19.4	6.94	53188	34573	7.61	55.7	QC115/215	no	Clear
28/05/2024	PW330	0089_PW330_240528	Perilstatic Pump	20.3	6.7	53260	34606	7.86	43.8		no	Clear
28/05/2024	PW331	0089_PW331_240528	Perilstatic Pump	20.3	6.83	53767	34951	7.9	43.3		no	Clear
29/05/2024	PW335	0089_PW335_240529	Perilstatic Pump	15.2	3.88	50894	33082	7.74	-76.9		no	Clear
29/05/2024	PW340	0089_PW340_240529	Perilstatic Pump	16.8	4.58	46755	30400	7.67	-110.5		no	Clear
29/05/2024	PW341	0089_PW341_240529	Perilstatic Pump	14.8	3.57	51079	33200	7.72	-42		no	Clear
29/05/2024	PW345	0089_PW345_240529	Perilstatic Pump	14.4	6.89	45007	29238	7.7	101.5		no	Clear
28/05/2024	PW346	0089_PW346_240528	Perilstatic Pump	18.2	3.96	35888	23314	7.6	3.5		no	Clear
27/05/2024	PW350	0089_PW350_240527	Perilstatic Pump	18	4.12	54119	35245	8.01	74.3		no	Clear
27/05/2024	PW351	0089_PW351_240527	Perilstatic Pump	18.5	4.91	53941	35601	8.07	86.2		no	Clear
27/05/2024	PW352	0089_PW352_240527	Perilstatic Pump	18.2	4.1	53471	35902	8.05	74.2		no	Clear
28/05/2024	PW356	0089_PW356_240528	Perilstatic Pump	19.5	7.46	51660	33588	7.78	30.1	QC114/214	no	Clear
28/05/2024	PW357	0089_PW357_240528	Perilstatic Pump	20.2	6.73	53647	34865	7.93	41.6		no	Clear
28/05/2024	PW358	0089_PW358_240528	Perilstatic Pump	20.8	6.81	54064	35139	7.96	49.1		no	Clear
29/05/2024	PW362	0089_PW362_240529	Perilstatic Pump	16.3	4.94	51038	33190	7.68	-108.7		no	Clear
29/05/2024	PW363	0089_PW363_240529	Perilstatic Pump	14.9	3.49	51007	33158	7.72	-46.7		no	Clear
29/05/2024	PW364	0089_PW364_240529	Perilstatic Pump	14.6	6.68	51294	33343	7.7	-21.1		no	Clear
29/05/2024	PW367	0089_PW367_240529	Perilstatic Pump	14.6	6.35	44793	29114	7.66	100.7		no	Clear
29/05/2024	PW368	0089_PW368_240529	Perilstatic Pump	17.8	5.26	49983	32494	7.62	61		no	Clear
29/05/2024	PW369	0089_PW369_240529	Perilstatic Pump	16.4	6.74	53426	34733	7.86	107.5		no	Clear
28/05/2024	PW374	0089_PW374_240528	Perilstatic Pump	19.1	5.93	24361	15834	7.67	25.5		no	Clear
28/05/2024	PW375	0089_PW375_240528	Perilstatic Pump	19.4	6.13	24465	15937	7.65	72.5		no	Clear
28/05/2024	PW378	0089_PW378_240528	Perilstatic Pump	19.2	5.05	25368	16838	7.82	78.2		no	Clear
27/05/2024	PW380	0089_PW380_240527	Perilstatic Pump	18.2	3.59	53419	34924	7.84	-103.1		no	Clear
27/05/2024	PW381	0089_PW381_240527	Perilstatic Pump	18.4	4.08	53945	35620	8.02	84.2		no	Clear
27/05/2024	PW401	0089_PW401_240527	Perilstatic Pump	17.9	4.5	54022	35115	8	82.7		no	Clear
28/05/2024	PW405	0089_PW405_240528	Perilstatic Pump	17.7	5.29	49997	32501	7.97	73.9		no	Clear
28/05/2024	PW407	0089_PW407_240528	Perilstatic Pump	17.3	4	49547	32206	7.97	82.1		no	Clear
28/05/2024	PW409	0089_PW409_240528	Perilstatic Pump	18.5	4.58	50047	32549	7.91	-24.4		no	Clear
28/05/2024	PW411	0089_PW411_240528	Perilstatic Pump	17.5	6.51	52476	34111	7.88	83.4	QC116/216	no	Clear
28/05/2024	PW413	0089_PW413_240528	Perilstatic Pump	17.5	5.13	52509	34124	7.87	83.9		no	Clear
28/05/2024	PW415	0089_PW415_240528	Perilstatic Pump	17.6	4.71	52447	34090	7.6	84.4		no	Clear

Monitoring Location	Date	Sample ID	Sampling Method	Sample Depth (m)	WaterBody Depth (m)	Temp (°C)	DO (mg/L)	EC (us/Cm)	TDS (mg/L)	pH	Eh (mV)	Water Colour	QC DUP#
SW130	29/05/2024	0089_SW130_240529	Direct_into_Bottle	0.1	0.6	14.3	2.95	52901	35086	7.74	15.6	Clear	
SW132	29/05/2024	0089_SW132_240529	Direct_into_Bottle	0.1	0.6	14.3	6.24	49707	32311	7.88	-17	Clear	
SW134	29/05/2024	0089_SW134_240529	Direct_into_Bottle	0.1	0.6	15.2	3.94	48695	31652	7.81	-65.9	Clear	
SW150	28/05/2024	0089_SW150_240528	Direct_into_Bottle	0.2	0.3	19.7	6.71	53823	34982	7.97	-2.9	Clear	Qc112/212
SW152	28/05/2024	0089_SW152_240528	Direct_into_Bottle	0.2	0.3	19.7	6.88	53968	35078	7.98	14.4	Clear	
SW154	28/05/2024	0089_SW154_240528	Direct_into_Bottle	0.2	0.3	19.6	6.57	54025	35114	7.97	27.4	Clear	
SW156	28/05/2024	0089_SW156_240528	Direct_into_Bottle	0.2	0.3	20	6.86	53749	34913	7.98	33.5	Clear	QC113/213
SW305	29/05/2024	0089_SW305_240529	Direct_into_Bottle	0.2	0.3	16.5	5.36	52212	33942	7.85	64.5	Clear	
SW309	28/05/2024	0089_SW309_240528	Direct_into_Bottle	0.1	0.8	17.9	4.72	53313	34653	7.94	43.6	Clear	
SW310	28/05/2024	0089_SW310_240528	Direct_into_Bottle	0.1	0.6	17.5	4.54	53149	35240	7.96	43.6	Clear	
SW311	28/05/2024	0089_SW311_240528	Direct_into_Bottle	0.1	0.5	18	4.52	53782	35274	8	42.7	Clear	
SW317	28/05/2024	0089_SW317_240528	Direct_into_Bottle	0.1	0.5	19.2	4.95	51140	33257	8.01	10.5	Clear	
SW318	28/05/2024	0089_SW318_240528	Direct_into_Bottle	0.1	0.5	19.4	4.77	51210	33286	8.05	15.7	Clear	
SW319	28/05/2024	0089_SW319_240528	Direct_into_Bottle	0.1	0.6	19	6.75	56378	34258	8.05	10.2	Clear	
SW353	27/05/2024	0089_SW353_240527	Direct_into_Bottle	0.1	0.7	18.9	3.96	53706	34908	8.13	80.8	Clear	
SW370	29/05/2024	0089_SW370_240529	Direct_into_Bottle	0.2	0.3	15.9	6.46	49993	32510	7.83	101.9	Clear	
SW371	29/05/2024	0089_SW371_240529	Direct_into_Bottle	0.2	0.3	16.5	6.74	52031	33820	7.79	72.6	Clear	
SW372	28/05/2024	0089_SW372_240528	Direct_into_Bottle	0.1	0.4	19.3	4.53	51298	33342	7.83	-43	Clear	
SW373	28/05/2024	0089_SW373_240528	Direct_into_Bottle	0.1	0.5	19.4	3.82	51197	33245	8.01	-42.5	Clear	
SW382	27/05/2024	0089_SW382_240527	Direct_into_Bottle	0.1	0.8	18.6	4.38	53968	35677	8.07	83.7	Clear	
SW383	27/05/2024	0089_SW383_240527	Direct_into_Bottle	0.1	0.5	18.6	4.78	53978	35082	8.12	83.5	Clear	
SW384	27/05/2024	0089_SW384_240527	Direct_into_Bottle	0.1	0.6	18.5	4.02	53075	35715	8	81.6	Clear	
SW406	28/05/2024	0089_SW406_240528	Direct_into_Bottle	0.1	0.5	17.7	5.41	49401	32119	7.96	70.3	Clear	
SW408	28/05/2024	0089_SW408_240528	Direct_into_Bottle	0.1	0.6	17.2	8.99	54989	35289	8.05	100.2	Clear	QC109/209
SW410	28/05/2024	0089_SW410_240528	Direct_into_Bottle	0.1	0.5	18.4	4.79	50175	32616	7.91	-26.5	Clear	
SW412	28/05/2024	0089_SW412_240528	Direct_into_Bottle	0.1	0.5	17.5	5.59	54092	35160	8.02	-103.3	Clear	
SW414	28/05/2024	0089_SW414_240528	Direct_into_Bottle	0.1	0.8	17.8	6	54040	35126	8.04	-110.4	Clear	
SW416	28/05/2024	0089_SW416_240528	Direct_into_Bottle	0.1	0.7	17.7	6.01	54087	35156	8.01	-110.2	Clear	

Monitoring Location	Date	Sample ID	Depth of Sediment Sampling (m)	Sampling Method	Sample Condition	Sample Description	QC Dup #
SD304	29/05/2024	0089_SD304_240529	0.8	Shovel_Trowel	Wet	Grey coarse sand	
SD306	28/05/2024	0089_SD306_240528	0.5	Shovel_Trowel	Wet	Beige coarse sand	
SD307	28/05/2024	0089_SD307_240528	0.5	Shovel_Trowel	Wet	Beige coarse sand	QC110/210
SD308	28/05/2024	0089_SD308_240528	0.7	Shovel_Trowel	Wet	Beige coarse sand	
SD314	28/05/2024	0089_SD314_240528	0.75	Shovel_Trowel	Wet	Beige coarse sand trace seaweed	
SD315	28/05/2024	0089_SD315_240528	0.8	Shovel_Trowel	Wet	Beige coarse sand	
SD316	28/05/2024	0089_SD316_240528	0.6	Shovel_Trowel	Wet	Beige coarse sand	
SD329	28/05/2024	0089_SD329_240528	0.2	Shovel_Trowel	Wet	Grey coarse sand	
SD330	28/05/2024	0089_SD330_240528	0.5	Shovel_Trowel	Wet	Grey coarse sand	
SD331	28/05/2024	0089_SD331_240528	0.8	Shovel_Trowel	Wet	Grey coarse sand	
SD335	29/05/2024	0089_SD335_240529	0.8	Shovel_Trowel	Wet	Sand, fine to med grained, beige, trace shells, trace organics	
SD340	29/05/2024	0089_SD340_240529	0.7	Shovel_Trowel	Wet	Sand, fine to med grained, beige, trace shells, trace organics	
SD341	29/05/2024	0089_SD341_240529	0.6	Shovel_Trowel	Wet	Sand, beige, fine to med grained, trace orgamics	
SD345	29/05/2024	0089_SD345_240529	0.5	Shovel_Trowel	Wet	Grey sand	
SD346	28/05/2024	0089_SD346_240528	0.8	Shovel_Trowel	Wet	Sand, fine to med grained, brown to beige, trace organics	
SD350	27/05/2024	0089_SD350_240527	0.5	Shovel_Trowel	Wet	Beige coarse sand	
SD351	27/05/2024	0089_SD351_240527	0.6	Shovel_Trowel	Wet	Beige coarse sand	
SD352	27/05/2024	0089_SD352_240527	0.6	Shovel_Trowel	Wet	Beige coarse sand	
SD356	28/05/2024	0089_SD356_240528	0.7	Shovel_Trowel	Wet	Grey coarse sand	
SD357	28/05/2024	0089_SD357_240528	0.6	Shovel_Trowel	Wet	Grey coarse sand	
SD358	28/05/2024	0089_SD358_240528	0.5	Shovel_Trowel	Wet	Grey coarse sand	
SD362	29/05/2024	0089_SD362_240529	0.6	Shovel_Trowel	Wet	Sand, fine to med grained, beige, trace shells, trace organics	
SD363	29/05/2024	0089_SD363_240529	0.6	Shovel_Trowel	Wet	Sand, fine to med grained, beige, trace orhanics	
SD364	29/05/2024	0089_SD364_240529	0.5	Shovel_Trowel	Wet	Sand, fine to med grained, beige, trace shells	
SD367	29/05/2024	0089_SD367_240529	0.8	Shovel_Trowel	Wet	Grey coarse sand	
SD368	29/05/2024	0089_SD368_240529	0.5	Shovel_Trowel	Wet	Grey coarse sand	
SD369	29/05/2024	0089_SD369_240529	0.5	Shovel_Trowel	Wet	Grey coarse sand	
SD374	28/05/2024	0089_SD374_240528	0.5	Shovel_Trowel	Wet	Sand, fine to med grained, beige, trace organics, trace shells	
SD375	28/05/2024	0089_SD375_240528	0.7	Shovel_Trowel	Wet	Sand, fine to med grained, beige, trace organics, trace fines trace shells	
SD378	28/05/2024	0089_SD378_240528	0.5	Shovel_Trowel	Wet	Sand, fine to med grained, beige, trace organics, trace shells	
SD380	27/05/2024	0089_SD380_240527	0.5	Shovel_Trowel	Wet	Beige coarse sand	
SD381	27/05/2024	0089_SD381_240527	0.5	Shovel_Trowel	Wet	Beige coarse sand	
SD401	27/05/2024	0089_SD382_240527	0.5	Shovel_Trowel	Wet	Beige coarse sand	
SD405	28/05/2024	0089_SD405_240528	0.7	Shovel_Trowel	Wet	Sand, fine to med grained, beige, trace organics, trace shells	QC107/207
SD407	28/05/2024	0089_SD407_240528	0.5	Shovel_Trowel	Wet	Sand, fine to med grained, beige, trace fines	
SD409	28/05/2024	0089_SD409_240528	0.5	Shovel_Trowel	Wet	Sand, fine to med grained, beige, trace fines	
SD411	28/05/2024	0089_SD411_240528	0.6	Shovel_Trowel	Wet	Beige coarse sand	QC117/217
SD413	28/05/2024	0089_SD413_240528	0.7	Shovel_Trowel	Wet	Beige coarse sand	QC118/218
SD415	28/05/2024	0089_SD415_240528	0.8	Shovel_Trowel	Wet	Beige coarse sand	

GK Environmental EQUIPMENT

Calibration Report

Multi-Parameter Water Quality Instrument

Customer:
Contact:

Manufacturer: YSI
Instrument: Professional Plus with Quatro cable
Serial #: 21H104234
Cable length: 1m 23G100019

Item	Test	Pass	Comments
Battery	2 x Alkaline C-cells	✓	Voltage reading above 2.9V
	Battery Saver	✓	Automatically turns off after 30 minutes if not used
Connections	Condition	✓	Good, clean
Cable	Condition	✓	Clean, no tears
Display	Operation	✓	
Firmware	Version	✓	0.0.78
Keypad	Operational	✓	
Display	Screen	✓	
Unit	Condition, seals and O-rings	✓	
Monitor housing	Condition	✓	
pH			
Condition		✓	Good, clean
pH millivolts for pH7 calibration range 0 mV ± 50 mV		✓	
pH 4 mV range + 165 to + 180 from 7 buffer mV value		✓	176.90 mV
pH slope		✓	55 to 60 mV/pH, ideal 59mV 59.31
Response time < 90 seconds		✓	
Calibrated and conforms to manufacturer's specifications		✓	
ORP			
Condition		✓	Good, clean
Response time < 90 seconds		✓	
within ± 80mv of reference Zobell Reading		✓	
Calibrated and conforms to manufacturer's specifications		✓	variance range ± 20mV 8 mV
Conductivity			
Condition		✓	Good, clean
Temperature		✓	°C
Conductivity cell constant 5.0 ± 1.0 in GLP file		✓	
Clean sensor reads less than 3 uS/cm in dry air		✓	
Calibrated and conforms to manufacturer's specifications		✓	µs/cm
Dissolved Oxygen			
Condition		✓	Good, clean
DO sensor in use		✓	polarographic
1.25 mil PE membrane (yellow membrane):		✓	
DO Sensor Value		✓	(min 4.31 uA - max 8.00 uA) Avg 6.15 uA
Calibrated and conforms to manufacturer's specifications		✓	ppm

This is to certify that the above instrument has been calibrated to the following specifications:

						Instrument Readings		
Parameter	**Standards**	**Reference**	**Calibration Point**	**Span**	**Units**	**Before**	**After**	**Units**
Temperature (17A100010)	Check Temp NATA	Room Temp	22.3	-0.2	°C	NA	22.1	°C
pH (23F)	pH 7.00	392512	7.01	-15.90	mV	7.07	7.01	pH
pH (23F)	pH 4.00	394799	4.00	161.00	mV	4.02	4.00	pH
Conductivity (17A100010)	2764 µs/cm at 25°C	23/0602	2764	GLP	4.97	2791	2764	µs/cm
ORP (23E)	Zobell A & B	23/3006	235	235	mV	225	227.2	mV
Zero DO (23G100436)	NaSO3 in distilled water	10175	0.0	NA	NA	0.6	0.0	%
100% DO (23G100436)	100% Air Saturation	Air	100.0	5.5	uA	105.6	100.0	%

Calibrated by: [redacted]

Calibration Date: 20-Apr-24
Next Due: 17-Oct-24

GK Environmental EQUIPMENT

Calibration Report

Multi-Parameter Water Quality Instrument

Customer:
Contact:

Manufacturer: YSI
Instrument: Professional Plus with Quatro cable
Serial #: 23G103457
Cable length: 1m (23G100259)

Item	Test	Pass	Comments
Battery	2 x Alkaline C-cells	✓	Voltage reading above 2.9V
	Battery Saver	✓	Automatically turns off after 30 minutes if not used
Connections	Condition	✓	Good, clean
Cable	Condition	✓	Clean, no tears
Display	Operation	✓	
Firmware	Version	✓	4.0.0
Keypad	Operational	✓	
Display	Screen	✓	
Unit	Condition, seals and O-rings	✓	
Monitor housing	Condition	✓	
pH			
Condition		✓	Good, clean
pH millivolts for pH7 calibration range 0 mV ± 50 mV		✓	
pH 4 mV range + 165 to + 180 from 7 buffer mV value		✓	175.00 mV
pH slope		✓	55 to 60 mV/pH, ideal 59mV 58.63
Response time < 90 seconds		✓	
Calibrated and conforms to manufacturer's specifications		✓	
ORP			
Condition		✓	Good, clean
Response time < 90 seconds		✓	
within ± 80mv of reference Zobell Reading		✓	
Calibrated and conforms to manufacturer's specifications		✓	variance range ± 20mV 8 mV
Conductivity			
Condition		✓	Good, clean
Temperature		✓	°C
Conductivity cell constant 5.0 ± 1.0 in GLP file		✓	
Clean sensor reads less than 3 uS/cm in dry air		✓	
Calibrated and conforms to manufacturer's specifications		✓	µs/cm
Dissolved Oxygen			
Condition		✓	Good, clean
DO sensor in use		✓	polarographic
1.25 mil PE membrane (yellow membrane):		✓	
DO Sensor Value		✓	(min 4.31 uA - max 8.00 uA) Avg 6.15 uA
Calibrated and conforms to manufacturer's specifications		✓	ppm

This is to certify that the above instrument has been calibrated to the following specifications:

						Instrument Readings		
Parameter	**Standards**	**Reference**	**Calibration Point**	**Span**	**Units**	**Before**	**After**	**Units**
Temperature (20A100065)	Check Temp NATA	Room Temp	22.6	0	°C	NA	22.6	°C
pH (22M)	pH 7.00	392512	7.01	-15.20	mV	7.13	7.01	pH
pH (22M)	pH 4.00	394799	4.00	159.80	mV	4.1	4.00	pH
Conductivity (20A100065)	2764 µs/cm at 25°C	24/0602	2764	GLP	5.01	2699	2764	µs/cm
ORP (23A)	Zobell A & B	23/3006	234	234	mV	227	226.5	mV
Zero DO (23J100061)	NaSO3 in distilled water	10175	0.0	NA	NA	0	0.0	%
100% DO (23J100061)	100% Air Saturation	Air	100.0	5.4	uA	94.6	100.0	%

Calibrated by: [redacted]

Calibration Date: 03-May-24
Next Due: 30-Oct-24

GK Environmental EQUIPMENT

Calibration Report

Multi-Parameter Water Quality Instrument

Customer:
Contact:

Manufacturer: YSI
Instrument: Professional Plus with Quatro cable
Serial #: 21E103540
Cable length: 1m 15E100278

Item	Test	Pass	Comments
Battery	2 x Alkaline C-cells	✓	Voltage reading above 2.9V
	Battery Saver	✓	Automatically turns off after 30 minutes if not used
Connections	Condition	✓	Good, clean
Cable	Condition	✓	Clean, no tears
Display	Operation	✓	
Firmware	Version	✓	0.0.78
Keypad	Operational	✓	
Display	Screen	✓	
Unit	Condition, seals and O-rings	✓	
Monitor housing	Condition	✓	
pH			
Condition		✓	Good, clean
pH millivolts for pH7 calibration range 0 mV ± 50 mV		✓	
pH 4 mV range + 165 to + 180 from 7 buffer mV value		✓	174.40 mV
pH slope		✓	55 to 60 mV/pH, ideal 59mV 58.54
Response time < 90 seconds		✓	
Calibrated and conforms to manufacturer's specifications		✓	
ORP			
Condition		✓	Good, clean
Response time < 90 seconds		✓	
within ± 80mv of reference Zobell Reading		✓	
Calibrated and conforms to manufacturer's specifications		✓	variance range ± 20mV 8 mV
Conductivity			
Condition		✓	Good, clean
Temperature		✓	°C
Conductivity cell constant 5.0 ± 1.0 in GLP file		✓	
Clean sensor reads less than 3 uS/cm in dry air		✓	
Calibrated and conforms to manufacturer's specifications		✓	µs/cm
Dissolved Oxygen			
Condition		✓	Good, clean
DO sensor in use		✓	Galvanic
1.25 mil PE membrane (yellow membrane):		✓	
DO Sensor Value		✓	(min 4.31 uA - max 8.00 uA) Avg 6.15 uA
Calibrated and conforms to manufacturer's specifications		✓	ppm

This is to certify that the above instrument has been calibrated to the following specifications:

						Instrument Readings		
Parameter	**Standards**	**Reference**	**Calibration Point**	**Span**	**Units**	**Before**	**After**	**Units**
Temperature(15E100002)	Check Temp NATA	Room Temp	21.8	-0.2	°C	NA	21.6	°C
pH (22M)	pH 7.00	392512	7.01	-21.60	mV	7.03	7.01	pH
pH (22M)	pH 4.00	394799	4.00	152.80	mV	4.04	4.00	pH
Conductivity (15E100002)	2764 µs/cm at 25°C	24/0602	2764	GLP	4.77	2923	2764	µs/cm
ORP (210614SIA605102)	Zobell A & B	23/3006	236	236	mV	226.7	228	mV
Zero DO (21J100574)	NaSO3 in distilled water	10175	0.0	NA	NA	1.9	0.0	%
100% DO (21J100574)	100% Air Saturation	Air	100.0	5.6	uA	103.1	100.0	%

Calibrated by: [redacted]

Calibration Date: 23-Apr-24
Next Due: 20-Oct-24

GK Environmental EQUIPMENT

Calibration Report

Multi-Parameter Water Quality Instrument

Customer:
Contact:

Manufacturer: YSI
Instrument: Professional Plus with Quatro cable
Serial #: 21G105322
Cable length: 1m 21F100351

Item	Test	Pass	Comments
Battery	2 x Alkaline C-cells	✓	Voltage reading above 2.9V
	Battery Saver	✓	Automatically turns off after 30 minutes if not used
Connections	Condition	✓	Good, clean
Cable	Condition	✓	Clean, no tears
Display	Operation	✓	
Firmware	Version	✓	0.0.78
Keypad	Operational	✓	
Display	Screen	✓	
Unit	Condition, seals and O-rings	✓	
Monitor housing	Condition	✓	
pH			
Condition		✓	Good, clean
pH millivolts for pH7 calibration range 0 mV ± 50 mV		✓	
pH 4 mV range + 165 to + 180 from 7 buffer mV value		✓	174.60 mV
pH slope		✓	55 to 60 mV/pH, ideal 59mV 58.61
Response time < 90 seconds		✓	
Calibrated and conforms to manufacturer's specifications		✓	
ORP			
Condition		✓	Good, clean
Response time < 90 seconds		✓	
within ± 80mv of reference Zobell Reading		✓	
Calibrated and conforms to manufacturer's specifications		✓	variance range ± 20mV 9 mV
Conductivity			
Condition		✓	Good, clean
Temperature		✓	°C
Conductivity cell constant 5.0 ± 1.0 in GLP file		✓	
Clean sensor reads less than 3 uS/cm in dry air		✓	
Calibrated and conforms to manufacturer's specifications		✓	µs/cm
Dissolved Oxygen			
Condition		✓	Good, clean
DO sensor in use		✓	Galvanic
1.25 mil PE membrane (yellow membrane):		✓	
DO Sensor Value		✓	(min 4.31 uA - max 8.00 uA) Avg 6.15 uA
Calibrated and conforms to manufacturer's specifications		✓	ppm

This is to certify that the above instrument has been calibrated to the following specifications:

						Instrument Readings		
Parameter	**Standards**	**Reference**	**Calibration Point**	**Span**	**Units**	**Before**	**After**	**Units**
Temperature	Check Temp NATA	Room Temp	21.6	-0.2	°C	NA	21.4	°C
pH (23J)	pH 7.00	392512	7.01	-11.50	mV	6.99	7.01	pH
pH (23J)	pH 4.00	394799	4.00	163.10	mV	3.97	4.00	pH
Conductivity (21G100029)	2764 µs/cm at 25°C	24/0602	2764	GLP	5.20	2560	2764	µs/cm
ORP (210715SIA605102)	Zobell A & B	23/3006	237	237	mV	223.5	228.3	mV
Zero DO (21G100131)	NaSO3 in distilled water	10175	0.0	NA	NA	1.5	0.0	%
100% DO (21G100131)	100% Air Saturation	Air	100.0	6.2	uA	125.4	100.0	%

Calibrated by: [redacted]

Calibration Date: 04-May-24
Next Due: 31-Oct-24

Date of Bump Test	Site ID	Unit Brand/ Model	Ambient Air Oxygen Calibration	Zero % Oxygen Solution Calibration	Standard Concentrations	Ambient Temperature (°C)	
27-5-24	0089-	YSI #21E103540	100% Saturation? (Y) N	0% Calibration? (Y) N NA	pH 4.00 (Y) / N pH 7.00 (Y) / N EC: ~~1,413~~µS/cm (Y) / N 2,760	23.0	pH 4 pH 7 EC
27-5-24	0089-	YSI # 21H104234	100% Saturation? (Y) N	0% Calibration? (Y) N NA	pH 4.00 (Y) / N pH 7.00 (Y) / N EC: ~~1,413~~µS/cm (Y) / N 2,760	23.1	pH 4 pH 7 EC
28-5-24	0089-	YSI # 21E103540	100% Saturation? (Y) N	0% Calibration? (Y) N NA	pH 4.00 (Y) / N pH 7.00 (Y) / N EC: 1,413µS/cm (Y) / N 2,760	20.4	pH 4 pH 7 EC
28-5-24	0089-	YSI # 21H104234	100% Saturation? (Y) N	0% Calibration? (Y) N NA	pH 4.00 (Y) / N pH 7.00 (Y) / N EC: 1,413µS/cm (Y) / N 2,760	13.1	pH 4 pH 7 Te
28-5-24	0089-	YSI #23610345 7	100% Saturation? (Y) N	0% Calibration? (Y) N NA	pH 4.00 (Y) / N pH 7.00 (Y) / N EC: ~~1,413~~µS/cm (Y) / N 2,760	12.4	pH 4 pH 7 Te
29-5-24	0089-	YSI # 21H10 4234	100% Saturation? (Y) N	0% Calibration? (Y) N NA	pH 4.00 (Y) / N pH 7.00 (Y) / N EC: ~~1,413~~µS/cm (Y) N 2,760	12.4	pH 4 pH 7 Te
29-5-24	0089-	YSI # 21E103540	100% Saturation? (Y) N	0% Calibration? (Y) N NA	pH 4.00 (Y) / N pH 7.00 (Y) / N EC: 1,413µS/cm (Y) / N 2,760	12.5	pH 4 pH 7 Te
29-5-24	0089-	YSI #23610345 7	100% Saturation? (Y) N	0% Calibration? (Y) N NA	pH 4.00 (Y) / N pH 7.00 (Y) / N EC: ~~1,413~~µS/cm (Y) / N 2,760	12.4	pH 4 pH 7 Te

APPENDIX

E

DATA QUALITY REVIEW

Cardno

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Stantec

Data Quality Review
PFAS Ongoing Monitoring Plan
Q2 2024 Monitoring Event

This appendix reviews the Quality Assurance (QA) and Quality Control (QC) documentation. Quality assurance encompasses the actions, procedures, checks and decisions undertaken to ensure sample integrity and representativeness, and the reliability and accuracy of analysis results. The QA documentation should also include an indication of the Data Quality Objectives sought in relation to each significant action, test or process involved in the assessment.

QC activities measure the effectiveness of the QA procedures by undertaking testing, and then comparing results to previously established objectives. QC work will include the internal laboratory testing as well as results of QC samples submitted such as trip blanks and duplicates. The quality of the information and/or data is deemed satisfactory when the QC results demonstrate that agreed objectives have been met.

QA/QC Aspects	Evidence & Evaluation
	QA Documentation
Project Quality Plan/Work Plan and Data Quality Objectives	The field investigation was carried out between the 27th and 29th May 2024 and is generally in accordance with the proposed scope of work, as documented in the SAQP (PFAS OMP SAQP HMAS Stirling, Cardno, May 2024, Rev14) issued to the client and in general compliance with Standards Australia 1998. AS/NZ 5667:1998 *Water quality – sampling,* NEPM "*National Environment Protection (Assessment of Site Contamination) Measure"* and PFAS NEMP 2.0. A quality control program was implemented during the Investigation and the quality assurance procedures used have been reiterated in the report (PFAS OMP Q2 2024 Factual Report). In addition, a safety, health and environment work method statement (SHEWMS) was also prepared. The Data Quality Objectives were expressed in terms of the purpose of the assessment and the relevant assessment criteria.
	Data Representativeness
Use of Composites	No Composites were used during the investigation
Holding Times	Chain of custody and laboratory reports provide evidence of holding times. Holding times complied with required timeframes.
Verification of field procedures	The methodology conducted during this investigation is documented in the body of the report and was in general conformance with the SAQP. Non-disposable equipment was decontaminated between sample locations.
Laboratory Reports	The following laboratory reports were considered for this data quality review: ▪ ALS reports: EP2407272, EP2407273, EP2407274, EP2407275, EP2407306, EP2407314, EP2407316, EP2407335, EP2407336, EP2407337, EP2407384, EP2407411, EP2407412, EP2407413, EP2407417, EP2407418, EP2407420, EP2407421, EP2407422, EP2407423, EP2407455. ▪ Eurofins report: 1102636

<table>
<tr><th>QA/QC Aspects</th><th>Evidence & Evaluation</th></tr>
<tr><td colspan="2">Data Precision & Accuracy</td></tr>
<tr><td>QC sample Frequency</td><td>
<table>
<tr><th>QC sample type</th><th>SAQP required frequency</th><th>Sample Collected</th></tr>
<tr><td>Blind duplicate</td><td>1 in 10 primary samples (10%)</td><td>7 for 59 groundwater samples (11.9%)
4 for 37 porewater samples (10.8%)
3 in 28 surface water samples (10.7%)
4 in 38 sediment samples (10.5%)</td></tr>
<tr><td>Interlab duplicate</td><td>1 in 10 primary samples (10%)</td><td>7 for 59 groundwater samples (11.9%)
4 for 37 porewater samples (10.8%)
3 in 28 surface water samples (10.7%)
4 in 38 sediment samples (10.5%)</td></tr>
<tr><td>Rinsate</td><td>1 per field crew per day</td><td>8 for 3 days (2 to 3 field personnel/day) (100%)</td></tr>
<tr><td>Field Blank</td><td>1 per field crew per day</td><td>8 for 3 days (2 to 3 field personnel/day) (100%)</td></tr>
</table>
The required QC frequency was achieved for all sample types.</td></tr>
<tr><td>RPD Acceptance criteria</td><td>
<table>
<tr><th>Magnitude of Results</th><th>Acceptable RPD range</th></tr>
<tr><td>< 10 x LOR</td><td>No limits</td></tr>
<tr><td>10 – 20 LOR</td><td>0% - 50%</td></tr>
<tr><td>> 20 x LOR</td><td>0% - 20%</td></tr>
</table></td></tr>
<tr><td>QC Testing – Blind Duplicates (Primary Lab)</td><td>Groundwater
▪ Primary Groundwater Samples Analysed: 59
▪ Blind Duplicate Samples Analysed: 7
RPDs were within acceptance criteria with one exception for QC104/MW172 (PFBS – 22%, PFPeS – 27%, PFPeA – 26%, PFHxA – 27%) These minor exceedances are likely due to the low analyte concentration. The higher values (primary sample) have been adopted for the assessment (conservative approach).
Porewater
▪ Primary porewater Samples Analysed: 37
▪ Blind Duplicate Samples Analysed: 4
All RPDs were within acceptance criteria.
Surface water
▪ Primary surface water Samples Analysed: 28
▪ Blind Duplicate Samples Analysed: 3
All RPDs were within acceptance criteria.
Sediment
▪ Primary Sediment Samples Analysed: 38
▪ Blind Duplicate Samples Analysed: 4
All RPDs were within acceptance criteria.</td></tr>
<tr><td>QC Testing – Interlab Duplicates (Secondary Lab)</td><td>Groundwater
▪ Primary Groundwater Samples Analysed: 59
▪ Interlab Duplicate Samples Analysed: 7</td></tr>
</table>

QA/QC Aspects	Evidence & Evaluation
	RPDs were within acceptance criteria with the following exceptions: o QC201 (PFHxS – 70%, PFHpS – 77%, PFOS – 79%, PFPeA – 51%, PFHxA – 50%, PFOA – 50%) o QC204 (PFBS – 49%, PFPeS – 67%, PFHxS – 68%, PFHxS – 68%, PFHpS – 46%, PFOS – 47%, PFPeA – 58%, PFHxA – 64%, PFOA – 86%) o QC205 (PFBS – 49%, PFPeS – 67%, PFHxS – 68%, PFHpS – 46%, PFOS – 47%, PFPeA – 58%, PFHxA – 64%, PFOA – 40%) These RPDs differences are likely due to the differences of methodologies between the primary and secondary laboratories and/or low concentrations of analytes under review. The higher concentrations were adopted for this assessment (conservative value reported on). This is not considered to have impacted the validity of the interpretation drawn upon this dataset. ***Porewater*** ▪ Primary porewater Samples Analysed: 37 ▪ Interlab Duplicate Samples Analysed: 4 All RPDs were within acceptance criteria. ***Surface water*** ▪ Primary surface water Samples Analysed: 28 ▪ Interlab Duplicate Samples Analysed: 3 All RPDs were within acceptance criteria. ***Sediment*** ▪ Primary sediment Samples Analysed: 38 ▪ Interlab Duplicate Samples Analysed: 4 All RPDs were within acceptance criteria.
Field Blanks	Field Blanks were collected at a rate of one per fieldwork day per field personnel. All field blank samples tested reported analytes below the laboratory limit of reporting.
Laboratory Internal QC	Evidence of the laboratories internal QC testing is present and complete in the reports. ALS (Primary) performed internal QC with adequate testing and satisfactory results for method blank, matrix spikes, laboratory control samples and laboratory duplicates. All Method Blank and laboratory Control results were within acceptable range. All Matrix Spikes generally reported recoveries within the acceptance range of 70% to 130% with the exception of the following: ▪ EP2407272, EP2407273, EP2407275, EP2407306, EP2407316, EP2407335, EP2407337, EP2407422, EP2407455: - Samples ID: SW382, PW381, SW132, MW199, Anonymous: Sulfate and Chloride matrix spike recoveries not determined due to the background concentrations exceeding 4x spike level. ▪ EP2407384, EP2407411, EP2407413: - Samples ID: Anonymous, MW228, SW410: Sulfate and Chloride matrix spike recoveries not determined due to the background concentrations exceeding 4x spike level. - Samples ID: MW255, Anonymous: PFHxS matrix spike recovery not determined due to the background concentrations exceeding 4x spike level. The frequency of laboratory QC samples was generally achieved with the exception of the following: ▪ EP2407273, EP2407306, EP2407316, EP2407335: - Laboratory Duplicates: PFAS by LCMSMS, expected frequency 10% not achieved. ▪ EP2407337, EP2407418, EP2407420, EP2407422: - Laboratory Duplicates: PFAS by LCMSMS, expected frequency 10% not achieved.

QA/QC Aspects	Evidence & Evaluation
	- Matrix Spikes: PFAS by LCMSMS, expected frequency 5% not achieved. The above outliers/exceptions are not considered to affect the reliability of the dataset.
Laboratory Method Detection Limit	Laboratory reports indicate the method detection limits were generally lower than the respective assessment criteria.
NATA endorsement of laboratory reports	Laboratory reports were stamped with the NATA endorsement stamp and signature. ALS Accreditation No. 825 Eurofins ARL Accreditation No. 1261
Calibration of Field Equipment	All equipment used during the investigation was calibrated by the supplier prior to use and daily readings of reference solutions (bump tests) were completed. The equipment calibration certificates, and daily field bump test records are provided in Appendix D.
Decontamination and Equipment Blanks	Rinsate blanks were collected at a rate of one per day per field personnel when reusable equipment was used. All rinsate samples tested reported analytes concentrations below the laboratory LORs.
	Data Comparability
Standard Procedures	Fieldwork procedures are detailed in the SAQP and reports and are comparable for each phase of Investigation.
Qualified Personnel	Staff involved in managing and reviewing the project and those involved in fieldwork are experienced and qualified personnel.
Sample Integrity	Field Chain of Custody/Laboratory request forms can be found in Appendix C.
	Data Completeness
Completeness of test program	The scope of work undertaken was generally consistent with the SAQP.
Validity of Data Set	The data quality review indicates no significant systematic errors in the data collection process and therefore, the data set used as the basis for groundwater, surface water, porewater and sediment investigation is considered valid and complete.