

Ongoing Monitoring Interpretive Report (October 2020 - March 2023)

Lavarack Barracks, Townsville

24-Oct-2023
PFAS Ongoing Monitoring Program
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AECOM

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Ongoing Monitoring Interpretive Report (October 2020 - March 2023) – Lavarack
Barracks, Townsville

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Lavarack Barracks, Townsville

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Abbreviations

Abbreviation	Term
AECOM	AECOM Australia Pty Ltd
AFFF	Aqueous Film Forming Foam
AHD	Australian Height Datum
ASC NEPM	National Environment Protection (Assessment of Site Contamination) Measure
BOM	Bureau of Meteorology
CSM	Conceptual Site Model
Defence	Department of Defence
DO	Dissolved Oxygen
DoH	Department of Health
DSI	Detailed Site Investigation
EC	Electrical Conductivity
ERA	Ecological Risk Assessment
6:2 FTS	6:2 Fluorotelomer sulfonic acid
GWE	Groundwater Elevation
HEPA	Heads of Environment Protection Authority Australia and New Zealand
HHRA	Human Health Risk Assessment
LOR	Limit of Reporting
NEMP	National Environmental Management Plan
NHMRC	National Health and Medical Research Council
OMIR	Ongoing Monitoring Interpretive Report
OMP	Ongoing Monitoring Plan
ORP	Oxidation Reduction Potential
PFAS	Per- and poly-fluoroalkyl substances
PFH _x S	Perfluorohexane sulfonate
PFOA	Perfluorooctanoic acid
PFOS	Perfluorooctane sulfonate
PMAP	PFAS Management Area Plan
QA/QC	Quality Assurance and Quality Control
SAQP	Sampling and Analysis Quality Plan
SWL	Standing Water Level

Units	Term
%	Percent
°C	Degrees Celsius
ha	Hectare
km	Kilometre
L	Litres
L/s	Litres per second
m ³	Metres cubed
m AHD	Metres Australian Height Datum
m btoc	Metres below top of casing
µS/cm	Microsiemens per centimetre
µg/L	Micrograms per Litre
mg	Milligrams
mg/kg	Milligrams per kilogram
mg/L	Milligrams per litre
mm	Millimetres
mV	Millivolts

Executive Summary

Introduction

AECOM Australia Pty Ltd (AECOM) was engaged by the Department of Defence (Defence) to implement the Ongoing Monitoring Plan (OMP) outlined in the PFAS Management Area Plan (PMAP) (Defence, 2020) for monitoring of select per- and poly-fluoroalkyl substances (PFAS) at Lavarack Barracks (the 'Base'), located in Townsville, Queensland.

This Ongoing Monitoring Interpretive Report summarises the results of the monitoring undertaken over the period between October 2020 and March 2023. The scheduled sampling events were completed in October 2020, March - April 2021, August 2021, February - April 2022, August - October 2022 and March 2023. This report provides interpretation of changes that have occurred during the reporting period.

This Ongoing Monitoring Interpretive Report has been prepared in general accordance with the Defence *PFAS OMP Annual Interpretive Report Guidance* (Version 0.4) issued in October 2022 (Defence, 2022).

Objective

The objective of the monitoring program set out in the OMP is to provide information on changes in the location and concentrations of PFAS on-base and off-base within the Management Area as shown by the orange outline on **Figure F1** in **Appendix A**.

The data is required to assist risk management decisions by Defence and State Government agencies to protect human health and the environment.

Monitoring Program

AECOM completed biannual monitoring (targeting wet and dry seasons) of groundwater, surface water and sediment between October 2020 and March 2023 in accordance with the Sampling and Analysis Quality Plan (SAQP) (AECOM, 2023b). The monitoring targeted PFAS, namely perfluorooctane sulfonate (PFOS), perfluorooctanoic acid (PFOA) and perfluorohexane sulfonate (PFHxS) and included selected locations within the Management Area.

Interpretive Assessment

Data collected during the monitoring period were compared to historical data for the included sampling locations.

PFAS concentrations in groundwater are relatively stable and within the same order of magnitude with the exception of some locations associated with known on-base PFAS source areas. An off-base well recorded an isolated spike in August 2021, but subsequent sampling events are with the same order of magnitude as historical results. Overall, the nature and extent of PFAS in groundwater has not changed from the understanding presented in previous investigation reports (RPS and Wood 2019a, 2019b; and 2019c; 2020a and 2020b) and the PMAP (Defence, 2020).

PFAS concentrations in surface water are generally stable with the exception of some locations associated with known on-base PFAS source areas. Off-base surface water monitoring locations reported some new historical maximums and exceedances of the adopted human health recreational water and ecological guideline values. These locations are within areas which have historically exceeded adopted guideline values, except at location SW220. The isolated new exceedance of the adopted human health recreational water guideline at SW220, in August 2022, for sum of PFOS and PFHxS is inconsistent with historical results off-base, however the results were within the same order of magnitude as previous results at this location.

What is an 'order of magnitude'?

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

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

Concentrations were reported below the adopted human health recreational water guideline and within the historical range of results for this location in March 2023 and therefore this isolated exceedance was not sustained over the monitoring period. Downstream sampling locations did not exceed the adopted human health recreational water guideline.

Sediment sample results were generally reported within historical ranges with the exception new historical maximum concentrations at some locations. The new historical maximum concentrations reported were either detected within one order of magnitude, or at concentrations close to previous maximum concentrations.

Conceptual Site Model and Risk Profile

The conceptual site model was reviewed, and no changes were identified to source, pathways or receptors within the Management Area.

The data collected during the OMP over the monitoring period suggest that the risk profile to human health and ecological receptors within the Management Area is unchanged, based on the following conclusions of the data assessment:

- Groundwater PFAS concentrations are relatively stable.
- The overall PFAS plume extent has not changed significantly compared to historical results.
- Despite new maximums and first-time detects, the inferred PFAS transport mechanisms (of overland flow, leaching to groundwater and groundwater/surface water interaction) and the groundwater, surface water and sediment concentrations are generally similar to those reported in (RPS and Wood, 2019a), (RPS and Wood, 2019b) and (RPS and Wood, 2020a). Some localised increases were noted which are inconsistent with the CSM, at MW131 (located in a source area on-base) and MW123I (located on the base boundary) which reported new maximum concentrations. Off-base well MW235S reported a new exceedance of adopted drinking water guidelines for PFOS+PFHxS that was isolated to a single event in August 2021. Subsequent results were below this guideline. MW235S is not used for drinking water. Groundwater is not extracted or used on-base so there is no new exposure pathway at MW131. MW123I and MW235S are within the plume extent previously considered for the CSM and the downgradient off-base well MW236S has consistently reported exceedances of the drinking water guidelines. No new exposure pathways for groundwater were identified.
- PFAS concentrations in surface water bodies were generally consistent with historical results with some locations off-base (at Gordon Creek) and on-base which reported an isolated new exceedance of the adopted human health recreational water guideline for PFOS+PFHxS concentrations. Off-base surface water locations have historically not exceeded this guideline in Gordon Creek, although given the exceedance was isolated in August 2022 and concentrations were below the guideline for the subsequent event, the risk profile is considered unchanged. Due to the condition of Gordon Creek (i.e., a swampy area and located next to the main road), it is not considered suitable for recreational purposes such as swimming and fishing. Continued monitoring is required to assess if this exposure pathway is complete and to confirm if the reported exceedances are sustained over both wet and dry seasonal conditions. Human health and ecological receptors in the Ross River and associated tributaries were identified in the CSM and the exposure pathways associated with these receptors remain the same and precautionary advice (and the associated signage) for consumption of fish from Idalia Lakes remains in place.
- Sediment concentrations have remained stable and consistent with historical results of the respective sub-catchment area either on-base or off-base.

Conclusions

The monitoring conducted over the period covered within this report is considered to have met the objectives of the SAQP (AECOM, 2023b) and the overall OMP (Defence, 2020). The monitoring network (being locations of combined sediment and surface water and groundwater wells) is considered generally appropriate and sufficient for the program objectives.

The CSM was reviewed, and no changes were identified to the sources, pathways or receptors at the base and within the Management Area.

Based on the data reviewed, there were no changes to the risk profile, and there are no triggers to review the ongoing monitoring program. Based on the data, AECOM considers that the conclusions made in the HHRA (RPS and Wood, 2019a) and ERA (RPS and Wood, 2020a) still apply.

Ongoing monitoring as part of the OMP for groundwater, surface water and sediment will continue to monitor the extent of PFAS, potential migration and any associated risk changes in accordance with the SAQP.

1.0 Introduction

AECOM Australia Pty Ltd (AECOM) was engaged by the Department of Defence (Defence) to implement the per- and poly-fluoroalkyl substances (PFAS) Ongoing Monitoring Plan (OMP) as outlined in the PFAS Management Area Plan (PMAP) (Defence, 2020) at Lavarack Barracks, Townsville (the 'Base').

The monitoring targeted PFAS in a range of environmental media (being sediment, surface water and groundwater) at selected locations on-base and in surrounding off-base areas, including the Management Area as outlined in the PMAP (Defence, 2020) and as depicted on **Figure F1**, in **Appendix A**.

To meet the objectives of the OMP, the monitoring was undertaken in accordance with the Sampling and Analysis Quality Plan (SAQP) (AECOM, 2023b). The SAQP was reviewed and updated as required, prior to each monitoring event.

This Ongoing Monitoring Interpretive Report has been prepared in general accordance with the Defence (2022) *PFAS OMP Annual Interpretive Report Guidance* (Version 0.4) issued in October 2022 (Defence, 2022). The report summarises the results of the monitoring completed in the monitoring period from October 2020 to March 2023 (hereafter referred to as "the monitoring period").

1.1 Purpose and Objectives

The objective of the monitoring program set out in the OMP is to continue to assess changes in the nature and extent of PFAS within the environment, where Defence's historical use of legacy Aqueous Film Forming Foam (AFFF) has led to a potentially elevated risk to a receptor, or potential future risk to a receptor within the Management Area.

Assessing changes in the distribution, concentration, and transport (pathways) of the contaminants against appropriate guideline values provides:

- An evidence-based approach for targeted and effective risk management decision making to protect human health and environmental receptors.
- An early warning indication that additional management of PFAS contamination may be warranted in areas not currently understood to be affected by PFAS.

The data will assist in the timely identification of risks and inform Defence's approach to the management of PFAS, including updates and revisions to the PMAP (Defence, 2020), Human Health Risk Assessment (HHRA) (RPS and Wood, 2019a) or Ecological Risk Assessment (ERA) (RPS and Wood, 2020a), as required.

1.2 Scope

The scope of works for this Ongoing Monitoring Interpretive Report is to assess changes to the nature and extent of select PFAS over the monitoring period and evaluate if these changes have implications for the understanding of the Conceptual Site Model (CSM) and the risk profile with respect to PFAS impacts within the Management Area.

This included the evaluation of data reported during the current monitoring period in the following biannual reports, which are included in **Appendix B**:

- *Sampling Event Factual Report, October 2020. PFAS OMP – Lavarack Barracks, Townsville, Queensland* (AECOM, 2021a).
- *Sampling Event Factual Report, March/April 2021. PFAS Ongoing Monitoring Program – Lavarack Barracks, Townsville, Queensland* (AECOM, 2021b).
- *Sampling Event Factual Report, March/April 2021. PFAS Ongoing Monitoring Program – Lavarack Barracks, Townsville, Queensland* (AECOM, 2021c).
- *Wet Season Sampling Factual Report, February to April 2022. PFAS OMP - Lavarack Barracks Townsville* (AECOM, 2022).

- *Dry Season Sampling Factual Report, August to October 2022. PFAS OMP - Lavarack Barracks Townsville (AECOM, 2023c).*
- *Wet Season Sampling Factual Report, March 2023. PFAS OMP - Lavarack Barracks Townsville (AECOM, 2023d).*

AECOM also compared data presented in this report to the data presented in the previous investigation reports (RPS and Wood 2019a, 2019b; and 2019c; 2020a and 2020b).

2.0 Site Setting

2.1 Site Description

The following summarises the base identification and setting presented in the PMAP (Defence, 2020) with updated information, where relevant.

Table 1 Site Identification and Setting Summary

Element	Description
Base ID	0229
Location	The base is located in Murray, a suburb of Townsville, Queensland. The base is located within the Townsville City Council local government area. Entry to the base is from University Road (Bruce Highway), Murray, approximately 7 km from Townsville City, as shown in Figure F1 in Appendix A .
Regional Climate (Refer to Section 6.3 for further details)	The regional climate of Townsville is classified as tropical; however, rainfall is typically lower than other locations on the coast of North Queensland. The wet season, from approximately November to April, is associated with hot and humid conditions with periods of heavy rain. The dry season is associated with dry, warm days and cool nights from approximately May to October.
Topography, geology and hydrogeology	<p>The topography of the Management Area is characterised by a hillslope profile descending from the Mount Stuart massif (located to the south of the base) towards the Ross River floodplain terraces (located to the north of the base). The topography of the developed areas of the base ranges from 10 - 15 m relative to the Australian Height Datum (AHD) to approximately 45 m AHD at the foot of Mount Stuart to the south-west. Elevations decrease from approximately 12 m AHD at the northern boundary of the base to approximately 5 m AHD at the Ross River.</p> <p>The Management Area is characterised by coastal floodplain sediments and colluvial hillslope soils over igneous granitic bedrock.</p> <p>The Detailed Site Investigation (DSI) by RPS and Wood identified there to be five main hydrogeological units on Base and in areas downgradient in off-base areas to the north; quaternary coastal floodplain alluvium, quaternary colluvium and upper headwaters alluvium, quaternary river alluvium, conglomerate bedrock and granite bedrock. A shallow aquifer is present within the unconsolidated quaternary age sediments (alluvium and colluvium) and a deeper aquifer within the bedrock (conglomerate and granite) (RPS and Wood, 2019b).</p> <p>Shallow groundwater off-base, in the Ross River floodplain, is present within the alluvial sediments and likely recharged by the network of inflowing freshwater tributaries, direct infiltration from rainfall in the catchment and baseflow from rainfall on the surrounding granitic outcrop and associated colluvium (Defence, 2020).</p>
Management Area Drainage	<p>The Management Area is located within the Ross River Basin which ultimately discharges into the Great Barrier Reef in the Coral Sea. Surface water drainage within the Management Area is comprised of several tributary sub-catchments which typically originate from the Mount Stuart massif and flow through the base and into the residential areas of Annandale and Idalia to the north and northeast within the off-base Management Area.</p> <p>The base has three main creek catchments and eight minor drainage channels which have been grouped as follows:</p> <ul style="list-style-type: none"> • A and West sub-catchment • G and Central sub-catchment

Element	Description
	<ul style="list-style-type: none"> J/K and East sub-catchment <p>These sub-catchments are shown on Figure F1 in Appendix A. The off-base Management Area contains relatively minor drainage features which are dry for much of the year, holding standing water only during and immediately after precipitation events.</p> <p>A single drainage feature from the western boundary of the base, within sub-catchment A, discharges to the Ross River upstream of Aplin's Weir, where the river is considered fresh water. The remainder of the drainage features discharge into the estuarine section of the Ross River and Idalia Lakes which are tidally influenced, saline and considered marine.</p>
Vegetation	<p>Most of the vegetation at the base has been modified or cleared. Natural vegetation occurring at the fringe of the base's development is dominated by Queensland Government mapped Least Concern Regional Ecosystems:</p> <ul style="list-style-type: none"> Poplar Gum (<i>Eucalyptus platyphylla</i>) and Clarkson's Bloodwood (<i>Corymbia clarksoniana</i>) woodlands on alluvial plains. Narrow-leaved Ironbark (<i>Eucalyptus crebra</i>) and Dallachy's Gum (<i>Corymbia dallachiana</i>) woodlands on alluvial plains. <p>Riparian and wetland vegetation dissect the Base and comprise primarily weed species including:</p> <ul style="list-style-type: none"> Rubber vine (<i>Cryptostegia grandiflora</i>) Lantana (<i>Lantana camara</i>) Chinee Apple (<i>Ziziphus Mauritania</i>) Leucaena (<i>Leucaena leucocephala</i>) Para Grass (<i>Urochloa mutica</i>) <p>A range of vulnerable species are known to occur across the Mount Stuart Training Area, south of the Base. However, these are located upgradient to the Management Area.</p>
Current and previous land use (including AFFF use)	<p>The base covers an area of 740 hectares and is a large working, training and accommodation facility. Activities carried out at the base are mainly related to general Defence training activities, and vehicle/equipment maintenance works. The base facilities include a current and Former Fire Station, a current and former firefighting training area, numerous vehicle and engineering workshops and current and former bulk fuel area/oil storage and distribution facilities.</p> <p>PFAS was a component of legacy AFFF used at the base which contained perfluorooctane sulfonate (PFOS) and perfluorooctanoic acid (PFOA) as active ingredients. Defence have phased out the use of legacy AFFF and replaced it with the use of Ansulite foam which does not contain PFOS or PFOA as active ingredients, although these compounds are still present in trace amounts. Ansulite is used by Defence only in emergency situations where human life is at risk, or in controlled environments to test equipment.</p> <p>Previous environmental investigations (RPS and Wood 2019a, 2019b, 2019c, 2020a and 2020b) have identified that soil, sediment, surface water and groundwater on- and off-base have been impacted by PFAS.</p> <p>No off-base PFAS sources have been identified, in addition to those previously identified in the DSI, which may be contributing to contamination within the Management Area.</p>

Element	Description
	Further information about infrastructure projects which have occurred at the base prior to and during the monitoring period are presented in Section 6.2 .
Land uses surrounding the base	The surrounding area comprises the residential suburbs of Annandale to the north of the base, Idalia and Oonoonba to the northeast and Wulguru to the east. Townsville Hospital, Tec-NQ and James Cook University are located to the west of the base and the Mount Stuart Training Area, which is used by Defence, is located to the south of the base.

2.2 Management Area

The Management Area is divided into ‘on-base’ and ‘off-base’ areas and comprises 2,365 hectares. The Management Area boundary is formed to the north by the Ross River, relevant sub-catchment boundaries to the east and west and Mount Stuart to the south. The Management Area includes the residential suburbs of Murray, Douglas, Annandale, Idalia, Oonoonba and Wulguru (Defence, 2020). The Management Area is shown on **Figure F1 (Appendix A)**.

2.3 Source Areas

The PMAP (Defence, 2020) identifies the following locations as PFAS source areas (refer to **Figure F1, Appendix A**):

- Former Fire Station
- Former Fire Training Area and Monocell
- Former Helicopter Squadron
- Suspected AFFF Disposal Area
- Soil Stockpile Area 1
- Eastern PFAS Contamination Area
- Former B Squadron
- Stockpile Designated Area 2.

The following secondary source areas have been identified:

- Lavarack Golf Course and Sporting Fields
- Top, Middle and Lower Dams.

2.4 Groundwater – Historical PFAS Data

The DSI (RPS and Wood, 2019b) reported that there were diffuse PFAS impacts in groundwater across the base with highest concentrations historically recorded at the following source areas: Former Fire Station, Monocell, the Eastern PFAS Contamination Area and the Former Fire Training Area.

PFAS were detected in groundwater in the off-base Management Area at lower concentrations. The PMAP (Defence, 2020) states that based on the distribution of PFAS in groundwater, infiltration of PFAS from surface water drainage channels to groundwater may be the primary migration pathway for PFAS to off-base groundwater aquifers.

2.5 Surface Water – Historical PFAS Data

Prior to the OMP, the DSI (RPS and Wood, 2019b) reported that PFAS were detected in surface water samples collected from all sub-catchments on-base and within off-base drainage channels with some locations exceeding the ecological criteria for freshwater and marine water (95% species protection values).

In samples collected from one location in the Ross River, upgradient of Blacks Weir (constituting Townsville's emergency water supply) and Lavarack Barracks management area, concentrations were reported below the adopted human health (drinking water) criteria. The source of the PFAS concentrations at this location is not outlined in the DSI, and has not been further assessed.

3.0 Sampling and Analytical Methodology

3.1 Sampling and Analysis Methodology

The SAQP (AECOM, 2023b) included in **Appendix D** outlined the proposed schedule and rationale for the sampling of six-monthly groundwater, surface water and sediment sampling on and off-base. This involved:

- Dry season sampling event in October 2020
- Wet season sampling event in March/April 2021
- Dry season sampling event in August 2021
- Wet season sampling event in February – April 2022
- Dry season sampling event in August – October 2022
- Wet season sampling event in March 2023.

The scope of the sampling is consistent between the dry season and wet season sampling events. The list of groundwater monitoring wells, surface water and sediment locations sampled during each of the above events, the rationale for sample location selection and the sample collection methodology is summarised in the SAQP (AECOM, 2023b).

3.2 Summary of OMP Works

A summary of the monitoring works implemented as part of the SAQP (AECOM, 2023b) for the monitoring period between October 2020 and March 2023 are presented in the Table 2. **Section 3.3** summarises deviations from the SAQP (AECOM, 2023b).

Table 2 Summary of Monitoring (October 2020 to March 2023)

Monitoring Event (Sampling dates)	Samples Collected	Analysis
October 2020 Biannual Sampling Event (AECOM, 2021a)	40 GW samples 19 SW samples 29 SD samples	PFAS extended suite
March/April 2021 Biannual Sampling Event (AECOM, 2021b)	40 GW samples 30 SW samples 31 SD samples	PFAS extended suite
August 2021 Biannual Sampling Event (AECOM, 2021c)	40 GW samples 20 SW samples 30 SD samples	PFAS extended suite
February – April 2022 Biannual Sampling Event (AECOM, 2022)	39 GW samples 31 SW samples 31 SD samples	PFAS extended suite
August – October 2022 Biannual Sampling Event (AECOM, 2023c)	38 GW samples 21 SW samples 31 SD samples	PFAS extended suite
March 2023 Biannual Sampling Event (AECOM, 2023d)	38 GW samples 31 SW samples 31 SD samples	PFAS extended suite

Notes: SW = surface water; GW = groundwater, SD = sediment

3.3 Deviations from SAQP Requirements

Deviations from the scope outlined in the SAQP as applicable to the monitoring period are summarised in **Table 3**.

Table 3 Deviations from SAQP

SAQP Requirement	Sampling Event Deviation	Impact of deviation on data set
October 2020 Biannual Sampling Event (AECOM, 2021a)		
Collection of surface water at SW150	Surface water sample location SW150 described in the OMP as being from a tap, could not be located and an appropriate location for sampling was unable to be identified.	Minor – No data available at this location for dry season 2020.
Co-located surface water and sediment samples were scheduled to be collected from SD/SW211 and SD/SW212.	During the sampling event it was identified that SD211/SW211 and SW212/SD212 are located on private property. Results from these locations were not included in the factual report and consent for the sampling was sought for subsequent events.	Nil
Collection of surface water at SW109, SW110, SW120, SW126, SW128, SW129, SW130, SW133, SW136, SW137	These locations were dry during the sampling event and samples of surface water were unable to be collected.	Minor – No data available at these locations for dry season 2020. The data set is considered representative of the conditions within the Management Area being monitored.
The water quality meter will be calibrated each day prior to the commencement of field activities.	The SAQP states the water quality meter is to be calibrated each day prior to the commencement to field activities. During this sampling event, the water quality meter was calibrated at the end of each day of sampling in preparation for the following day.	Nil. The water quality meter calibration demonstrated that the calibration was not affected by the timing of the calibration.
March/April 2021 Biannual Sampling Event (AECOM, 2021b)		
Collection of surface water at SW133	No surface water was available and as such the sample was not collected.	Minor – No data available at this location for wet season 2021. The data set is considered representative of the conditions within the Management Area being monitored.
Co-located surface water and sediment samples at SW137/SD137	Sampling location SW137/SD137 was replaced by location SW144/SD144 as SW144/SD144 is the intended sampling location in the PMAP (Defence, 2020).	Nil
Collection of duplicate and triplicate samples at a rate of one in ten primary samples for sediment.	The SAQP states the duplicate and triplicate samples are to be collected at a rate of 10% being one in ten primary samples. A total of 31 primary samples were analysed with three out of the required four pairs of the	Minor - The actual rate of 9.6% is marginally lower than the target rate of 10%, AECOM considers this difference to be negligible and that the data is sufficient for the purposes of the ongoing monitoring program.

SAQP Requirement	Sampling Event Deviation	Impact of deviation on data set
	duplicate and triplicate samples analysed for an actual rate of 9.6%.	
Collection of rinsate samples at a rate of one per day of sampling.	One rinsate blank sample collected on 29 March 2021 returned detections of PFOS and (PFHxS). Two surface water samples (SW135 and SW139) were re-sampled on 22 June 2021 due to the risk of cross contamination of surface water samples collected on 29 March 2021.	Nil
August 2021 Biannual Sampling Event (AECOM, 2021c)		
Collection of surface water at SW109, SW110, SW129, SW130, SW113, SW120, SW126, SW128, SW132, SW133, SW136	No surface water was available and as such the samples were not collected.	Minor – No data available at these locations for dry season 2021. The data set is considered representative of the conditions within the Management Area being monitored.
Collection of sediment at SD132	High proportion of large cobbles and no sediment and as such no sediment sample was collected.	Nil. The data set is considered representative of the conditions within the Management Area being monitored.
February – April 2022 Biannual Sampling Event (AECOM, 2022)		
Collection of surface water at SW120, SW126, SW128, SW129, SW130, SW133, SW134	No surface water was present at the time of the initial sampling round in March 2022 at SW120, SW126, SW128, SW129, SW130, SW133, SW134. Sampling was completed in April 2022, following rainfall when surface water was present.	Nil. Following rainfall, the locations were sampled.
Collection of sediment at SD121, SD132, SD242	No sediment was present in the March 2022 sampling event and was therefore collected following rainfall in April 2022.	Nil – data set is considered representative of broader Base conditions at the time of data collection.
Collection of groundwater samples from MW117S, MW117D, MW118 and MW119 as part of 2022 wet season.	Monitoring wells were accessed for sampling two weeks before the main sampling event as the wells were in a construction zone, and some wells were set to be destroyed during the construction works. MW117S was not sampled as it had already been destroyed. The HydraSleeve™ at MW117D was removed by construction workers prior to destruction and was observed to have a high sediment load.	No data were available from MW117S as the well was destroyed. The results from MW117D were interpreted with caution as sample collection was not completed in accordance with the SAQP.
Collection of additional groundwater sample from MW217.	Laboratory analytical results for the sample collected at MW217 on 3 March 2022 indicated PFAS detections higher than previous results for this location (including 0.06 µg/L 6:2 Fluorotelomer sulfonic acid	Resampling of the well indicated PFOS concentrations were below the limit reporting and consistent with historical results, therefore results for MW217 collected on 3 March 2022 were not verified, not considered representative of

SAQP Requirement	Sampling Event Deviation	Impact of deviation on data set
	(6:2 FTS), 0.02 µg/L PFHxS and 0.08 µg/L PFOS). Resampling in April 2022 confirmed that only PFHxS was present at detectable concentrations (0.01 µg/L).	PFAS concentrations and discarded. The April 2022 result was accepted.
Collection of additional surface water sample at SW110.	Laboratory analytical results for the sample collected at SW110 on 1 March 2022 detected a new maximum PFAS concentration (sum of PFAS 95.6 µg/L). To verify the result, the location was resampled on 26 April 2022.	The results from resampling of SW110 on 26 April 2022 indicated PFAS concentrations were below the initial sampling result on 1 March 2022, and historical results, possibly due to recent rainfall. Therefore, both results from March and April 2022 were accepted as representative of surface water PFAS concentrations at this location in the post wet season event for 2022.
August – October 2022 Biannual Sampling Event (AECOM, 2023c)		
Collection of surface water at SW119, SW120, SW126, SW128, SW129, SW130, SW132, SW133, SW134 and SW136	No surface water was present during the dry season sampling event at SW119, SW120, SW126, SW128, SW129, SW130, SW132, SW133, SW134 and SW136.	The data set is considered representative of the conditions within the Management Area being monitored.
Gauging and sampling at MW235S.	Depth to groundwater could not be measured at MW235S during the gauging round.	Following clearing of the roots in the well, samples were able to be collected using a decontaminated steel bailer from MW235S and sufficient gauging data was collected across the base to determine groundwater flow direction. No impact on the data set.
Collection of sediment sample from SD120.	Sediment was collected at SD120 in September 2022 after the main sampling event due to access issues during the August sampling round.	The location was able to be accessed and a sample obtained with no impact on the data set.
Collection of additional groundwater sample at MW131. Trip blank and rinsate samples not collected for verification sampling.	Laboratory analytical results for the sample collected at MW131 on 26 August 2022 indicated PFAS detections (sum of PFAS 656 µg/L) an order magnitude higher than historical maximum results. To verify the result, the well was resampled on 7 October 2022.	Resampling of the well indicated PFAS concentrations were closer to the previous historical maximum (pre-August 2022), however were still higher. The October 2022 result was accepted as representative of groundwater PFAS concentrations for the 2022 dry season. Further sampling is required to establish if this is a potential increasing trend at this location. No impact to data set from absence of trip blank and rinsate for verification sampling.
Collection of additional surface water sample at SW110. Trip blank and rinsate samples not collected for verification sampling.	Laboratory analytical results for the sample collected at SW110 on 22 August 2022 detected a new maximum PFAS concentration (sum of PFAS 95.6 µg/L). To verify the	The results from resampling of the location in October 2022 indicated PFAS concentrations within the same order of as the initial sampling result on 22 August 2022 and consistent with historical maximum concentrations.

SAQP Requirement	Sampling Event Deviation	Impact of deviation on data set
	result, the location was resampled on 7 October 2022.	Therefore, both results from August and October 2022 were accepted as representative of surface water PFAS concentrations at this location in the dry season for 2022. No impact to data set from absence of trip blank and rinsate for verification sampling.
March 2023 Biannual Sampling Event (AECOM, 2023d)		
Collection of surface water at SW120 and SW121	SW120 was noted as dry and couldn't be sampled. SW121 couldn't be sampled due to overgrown vegetation preventing access to water.	Minor – No data available at these locations for wet season 2023. The data set is considered representative of the conditions within the Management Area being monitored.

3.4 Changes to the monitoring network

Changes to the monitoring network and well maintenance activities that were undertaken during the monitoring periods are summarised in **Table 4**.

Table 4 Summary of changes to the monitoring network

Sampling Event	Location ID	Action completed
October 2020 Biannual Sampling Event (AECOM, 2021a)	MW003 and MW115	The casing of MW003 and MW115 were bent, however a sample was able to be collected using a HydraSleeve™ without a collar. MW003 was repaired and resurveyed on 16 September 2021.
March/April 2021 Biannual Sampling Event (AECOM, 2021b)	MW121 and MW125	The monument at MW121 is not secured and the plinth at MW125 is cracked. No action taken as sampling is unaffected.
	MW226	Well cap on MW226 identified as missing and was replaced in August 2021.
August 2021 Biannual Sampling Event (AECOM, 2021c)	MW232	Bolts of the gatic cover at MW232 were rusted. New bolts were installed in August 2021.
	MW233	The monument at MW233 is not secured. No action taken as sampling is unaffected.
February – April 2022 Biannual Sampling Event (AECOM, 2022)	MW117S and MW117D	During the April 2022 Sampling Event monitoring well sample locations MW117D and MW117S were damaged by construction works and therefore have been removed from the SAQP (AECOM, 2023b).
	MW003	Cut off well at bend below ground level and install replacement monument. Resurvey well.
	MW121	Repaired concrete plinth to stabilise well.
	MW226	Replaced well cap.
	MW232	Replaced rusted bolts.
	MW233	Ground around concrete plinth reinstated to stabilise well.
August – October 2022 Biannual Sampling Event (AECOM, 2023c)	MW235S	Clearing of the roots within the well using a decontaminated steel bailer.

4.0 Quality Assurance and Quality Control

Data validation pertaining to the data in this report has been previously completed and discussed within the individual factual reports listed in **Section 1.2**.

Data validation procedures employed in the assessment of the field and laboratory QA/QC data indicated that the reported analytical results were representative of the sample locations and that the overall quality of the analytical data produced is acceptably reliable for the purpose of the factual and interpretive reports.

5.0 Screening Criteria

Adopted screening criteria references national guidance in the form of the PFAS National Environmental Management Plan (NEMP) Version 2.0 [Heads of Environment Protection Authority Australia and New Zealand (HEPA), 2020], Defence estate and environmental strategies, and Defence PFAS-specific strategies and guidance. At the time of preparing this report, several guidance documents were in circulation in Australia including:

- PFAS NEMP Version 2.0 (HEPA, 2020).
- Department of Health (DoH), 2017. *Health Based Guidance Values for PFAS for use in site investigations in Australia*. April 2017 (DoH, 2017).
- National Health and Medical Research Council (NHMRC), 2019. *Guidance on PFAS in Recreational Water*. August 2019 (NHMRC, 2019).
- *National Environment Protection (Assessment of Site Contamination) Measure 1999*, Schedule B1, as amended in 2013 (ASC NEPM, 2013).

The adopted PFAS screening criteria to assess the data generated as part of the monitoring are presented in **Table 5** below.

The screening criteria are set out in the OMP as part of the PMAP (Defence, 2020).

Table 5 Summary of Adopted Screening Criteria

Pathway	Compound	Criteria	Comment/Reference
Human Health Receptors			
Off-base - Drinking Water	PFOS+PFHxS ¹	0.07 µg/L	The values are from the PFAS NEMP (HEPA, 2020). <i>All off base groundwater results will be compared to these criteria. as well as one surface water location (SW245) which is within Townsville's emergency drinking water supply.</i>
	PFOA	0.56 µg/L	
Recreational use – surface water	PFOS+PFHxS ¹	2 µg/L	The values are from HEPA (2020). <i>All surface water results will be compared to these criteria.</i>
	PFOA	10 µg/L	
Ecological Receptors			
Freshwater and marine water (95% species protection values)	PFOS	0.13 µg/L	The values are from the HEPA (2020). <i>All surface water and groundwater results will be compared to these criteria.</i>
	PFOA	220 µg/L	

Note:

¹ Where the guideline values refer to the sum of PFOS and PFHxS, this includes PFOS only, PFHxS only, as well as the sum of the two (HEPA, 2020).

It is noted that at the time this report was prepared no HEPA (2020) endorsed criteria was available for PFAS in sediments.

6.0 Contextual and Ancillary Information

6.1 Remediation Projects

There were no active PFAS remediation projects occurring at the base during the monitoring period (October 2020 – March 2023).

PMAP delivery works commenced at the base in 2021. Soil and groundwater investigation works were conducted at two source areas (the Former Fire Station, and former fire training area and monocell). A mass flux study was also conducted which required the installation of automatic surface water samplers and flow meters at Base boundary sampling locations. The mass flux sampling commenced November 2021 and continued through the 2021/22 wet season and 2022 dry season.

The mass flux study (WSP Golder, 2023) concluded that surface water was the dominant PFAS migration pathway, with the majority (approximately 75%) of off-base PFAS mass discharged from the on-base dams in Catchment G, at the boundary, in the centre of the base. The on-base dams receive surface water input from the former Fire Station, suspected AFFF disposal area, former helicopter squadron and former fire training area. Although only an estimated 15% of the total base wide annual PFAS mass discharge via surface water, Catchment K is likely the primary source of PFAS mass entering Idalia Lakes. Off-base flux of PFAS in groundwater is estimated to contribute up to 6% of the annual PFAS mass discharge for the base.

Recommendations from these works are in the process of being finalised and will be reflected in future updates to the PMAP.

6.2 Infrastructure Projects On-base

Construction of the Land 121 project commenced in 2016 and was completed in late 2019, after the publication of the DSI and prior to the commencement of the ongoing monitoring program sampling event. Civil works and construction included significant alterations and reworking of soils and infrastructure over a large area, on the eastern side of the base, resulting in a potentially large, diffuse source of PFAS. An engineered, covered stockpile was constructed to store PFAS impacted soils resulting from the civil works process and a water treatment system was operated to treat PFAS impacted surface waters generated from the project. The water treatment plant was removed upon completion of the project.

Redevelopment works have occurred at the former B Squadron (an identified source area) as part of the Land 400 project, prior to and during the monitoring period. A building has now been constructed in this area.

Sewer upgrade works were conducted along the eastern boundary and off-base to the northeast commencing in early 2022.

Ground disturbance associated with these redevelopments has the potential to impact the nature and extent of PFAS in this area of the base as follows:

- Overland surface water flow in disturbed areas could result in increased mobilisation of PFAS in surface water which would result in higher concentrations of PFAS in drainage lines in the northeastern corner of the base.
- Any dewatering activities could have a localised impact on groundwater flow and PFAS distribution.

It is noted that Lavarack golf course closed as a recreational area in late 2021 with irrigation of the grass also noted to have been stopped in this area through the 2022 dry season.

6.3 Significant Weather Events

Climatic data for the region is recorded by the Bureau of Meteorology (BOM) at Townsville Aero (Station 032040), located approximately 8 km northwest of the base (BOM, 2023). A graphical representation of monthly rainfall data from the monitoring period compared with mean monthly rainfall for Townsville Area (station 032040) recorded by BOM (2023a) is presented in Plate A.

Generally, below average rainfall was recorded across the wet and dry season events of 2020 to 2021 which included sampling events undertaken in October 2020, March/April 2021, and August 2021. The only month that recorded above average rainfall was August 2021 where the monthly rainfall total of 35.2 mm was above the average of 15.6 mm.

For the 2021/2022 post wet season monitoring event, most of the sampling was undertaken in February 2022 and March 2022 with limited sampling undertaken in April 2022. Through the 2021/2022 wet season from November to April, the monthly rainfall was above average in November 2021, January 2022 and April 2022. Below average rainfall was recorded in December 2021, February and March 2022.

The majority of the 2022 dry season sampling was undertaken in August 2022 with limited sampling in October 2022. Through the 2022 dry season from May to October 2022, the monthly rainfall was generally above the long-term monthly average, with the exception of August 2022 which recorded below average rainfall. The 2022/2023 wet season generally had monthly rainfall totals above the long-term monthly average with the sampling event subsequently being conducted in March 2023 when below average rainfall was recorded.

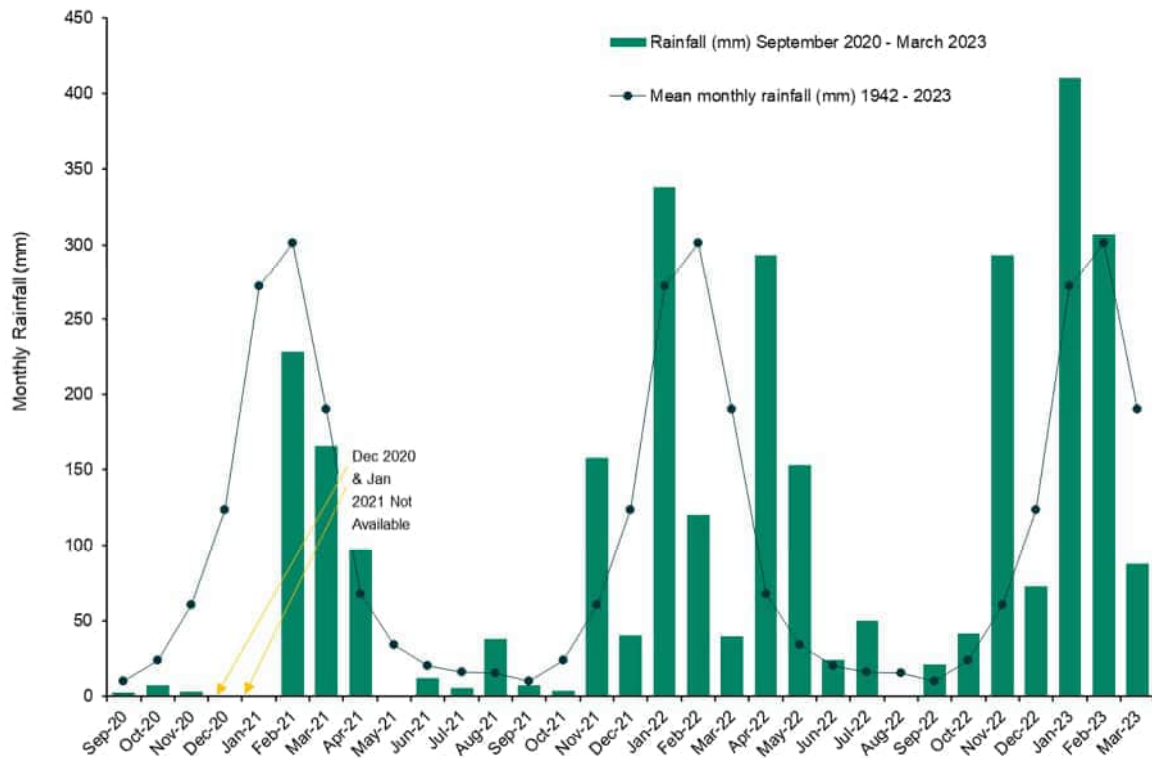


Plate A Rainfall data from September 2020 to March 2023 compared with mean monthly rainfall for Townsville Aero (station 032040) (BOM, 2023)

Wet weather days (i.e., days with >15 mm of rainfall) were recorded (BOM, 2023) on two days in April 2022, when sampling was completed, as follows:

- 22 April 2022 (95.6 mm rainfall). Samples collected on this day include:
 - Supplementary groundwater sample at MW217 to verify new historical maximum results detected from the initial sample collected for the post wet season event between 28 February and 4 March 2022.
 - Surface water samples at SW120, SW126, SW128, SW129, SW130, SW133 and SW134, collected following rainfall, as no surface water was present during the post-wet season event between 28 February and 4 March 2022.
 - Sediment samples at SD121, SD132 and SD242, as no sediment was present during the post-wet season event between 28 February and 4 March 2022.
- 26 April 2022 (153.2 mm rainfall). Samples collected on this day include:
 - Supplementary surface water sample at SW110 to verify new historical maximum results detected from the initial sample collected for the post-wet season event between 28 February and 4 March 2022.

7.0 Monitoring Data Summary

The following monitoring events were completed by AECOM during the monitoring period:

- October 2020 Sampling event, from 26 October to 3 November 2020 (post dry season).
- March/April 2021 Sampling event, from 26 March and 1 April, and 13 May 2021 (post wet season).
- August 2021 Sampling event, from 16 to 20 August 2021 (post dry season).
- February – April 2022 Sampling event (post wet season), over the period including:
 - 18 February 2022 (prior to the main sampling event due to access restrictions at selected locations);
 - 28 February to 4 March 2022 (main sampling event); and
 - 22 April to 26 April 2022 (verification sampling and MW217 and SW110, as well as surface water and sediment sampling at select locations due to absence of sufficient surface water and sediment at those locations during the main sampling event).
- August – October 2022 Sampling event (post dry season), over the period including:
 - 22 August to 26 August 2022 (main sampling event);
 - 3 September 2022 (due to access restrictions at one sediment location, SD120); and
 - 7 October 2022 (verification sampling at MW131 and SW110)
- March 2023 Sampling event (post wet season) from 6 to 15 March 2023.

The above sampling events were timed to coincide with the end of the wet season and the end of the dry season. Potential seasonal trends and related data are further interpreted in **Section 8.0**.

The results are summarised in the following sections and shown on **Figure F10** to **Figure F45** (**Appendix A**). The results are presented in **Table T1** to **T6** (**Appendix B**).

AECOM has also considered the historic data collected between 2017-2019 as part of the DSI (RPS and Wood, 2019b) and the seasonal monitoring (RPS and Wood, 2019c and 2020b).

The statistical method of Mann-Kendall has not been used to identify trends given the site is located in a tropical area which has a climate of wet and dry seasons. There is insufficient data (i.e., at least eight monitoring event results are required) to allow statistical analysis of corresponding seasons (e.g., post wet season to post wet season).

7.1 Groundwater

7.1.1 Groundwater Elevation and Flow Direction

The standing water level (SWL) was measured in all the sampled monitoring wells to evaluate the groundwater elevations (to m AHD).

Groundwater elevation (GWE) ranges within the monitoring wells gauged over the six monitoring events, in the monitoring period, are summarised below in **Table 6**.

Full records of the gauging data are presented in **Table T1**, **Appendix B** and in each of the respective factual reports provided in **Appendix E**.

Table 6 Summary of Groundwater Elevation

Gauging Event	No. Wells	Min. SWL (m btoc)	Max. SWL (m btoc)	Min. GWE (m AHD)	Max. GWE (m AHD)
October 2020	40	0.565 (MW232)	5.964 (MW072)	0.603 (MW205_S)	23.306 (MW141)
March/April 2021	40	0.491 (MW232)	5.564 (MW235_S)	1.232 (MW205_S)	26.012 (MW141)
August 2021	40	0.6 (MW232)	5.905 (MW205_S)	0.495 (MW205_S)	24.743 (MW141)
February – April 2022	39	0.561 (MW232)	5.373 (MW205S)	1.027 (MW205S)	25.705 (MW141)
August – October 2022	38	0.465 (MW232)	5.824 (MW205S)	0.576 (MW205S)	25.507 (MW141)
March 2023	38	0.270 (MW232)	5.125 (MW205S)	1.275 (MW205S)	25.434 (MW141)

Note: SWL = Standing Water level, GWE = Groundwater Elevation, m AHD = metres Australian Height datum, mbtoc = metres below top of casing.

Groundwater contours and inferred groundwater flow directions in the shallow aquifer (alluvium) are presented **Figure F4 to Figure F9, Appendix A**.

During the monitoring period, seasonal variability observed in groundwater elevation was generally within historical ranges except for the March 2023 monitoring event where most wells recorded new historical maximum groundwater elevations following above average rainfall in January and February 2023.

Surrounding the base, groundwater flow is influenced by Mount Stuart to the south which is the topographic high point. **Figure F4 to Figure F9 in Appendix A** show the inferred groundwater flow direction on Base is north and northeast towards the Ross River floodplain. Following the wet season events, groundwater elevations were generally higher than the dry season at groundwater monitoring locations across the Management Area, however the groundwater flow direction was consistent between post-dry season and post-wet season sampling events.

This is consistent with previous investigations (AECOM, 2023a), RPS and Wood, 2019b, 2019c, 2020a and 2020b) (**Table T1, Appendix B**).

7.1.2 Geochemical Parameters

Groundwater geochemical parameters were measured prior to collecting groundwater samples and are summarised in **Table 7** below. Current and historical field geochemical parameters are presented in **Table T1, Appendix B**.

Table 7 Summary – Groundwater Geochemical Parameters

Sampling Event	Dissolved Oxygen (DO) (mg/L)	Electrical Conductivity (EC) ($\mu\text{S}/\text{cm}$) ¹	pH (pH units)	Corrected Oxidative Reductive Potential (ORP) (mV) ²	Temperature (°C)
October 2020 (Dry Season)					
Minimum	1.44 (MW220S and MW123I)	7.4 (MW236S)	5.50 (MW232)	126.7 (MW205S)	26.2 (MW226)
Maximum	7.93 (MW236S)	51,290.0 (MW232)	7.61 (MW117S)	306.5 (MW125S)	31.0 (MW074)
March / April 2021 (Wet Season)					
Minimum	0.09 (MW101)	516.0 (MW122)	6.08 (MW217)	49.8 (MW018)	26.2 (MW220S)
Maximum	7.26 (MW125I)	42007.0 (MW232)	8.68 (MW102)	394.1 (MW116)	37.0 (MW117D)
August 2021 (Dry Season)					
Minimum	0.42 (MW115)	481.2 (MW123I)	6.19 (MW217)	26.5 (MW101)	22.3 (MW226)
Maximum	5.30 (MW205S)	37,926.0 (MW232)	7.99 (MW065)	423.6 (MW205S)	28.7 (MW072)
February – April 2022 (Wet Season)					
Minimum	0.25 (MW139)	79.3 (MW018)	5.72 (MW217)	-0.2 (MW115)	26.3 (MW217)
Maximum	6.94 (MW018)	51,132.0 (MW232)	7.60 (MW065)	416.6 (MW236S)	36.5 (MW106)
August – October 2022 (Dry Season)					
Minimum	0.30 (MW220S)	719.0 (MW115)	5.68 (MW217)	40.6 (MW115)	21.5 (MW226)
Maximum	18.20 (MW002)	42,048.0 (MW232)	7.91 (MW115)	374.0 (MW131)	28.2 (MW074)
March 2023 (Wet Season)					
Minimum	0.51 (MW235S)	4.9 (MW101)	6.24 (MW220S)	52.5 (MW212)	27.0 (MW138)
Maximum	6.22 (MW128)	35,058.0 (MW232)	7.89 (MW065)	412.8 (MW138)	32.7 (MW116)

Note: 1 – Microsiemens per centimetre; 2 – Oxidation-reduction potential measured in millivolts (mV) and corrected values calculated by the addition of an offset voltage of 194 mV (for reference electrode Ag/AgCl).

The stabilised readings from the monitoring period indicate:

- Poorly to well oxygenated conditions
- Fresh to saline conditions
- Slightly acidic to slightly alkaline conditions
- Moderately to strongly reducing conditions.

The groundwater parameters recorded during the monitoring period are generally consistent with previous investigations (RPS and Wood, 2019b and 2019c).

7.1.3 Groundwater Analytical Results

All groundwater analytical results for the monitoring period are presented **Table T2 (Appendix B)**. Monitoring locations are presented in **Figure F2 (Appendix A)**. Concentration maps of PFOS+PFHxS and PFOA are presented in **Figure F10 to F21 (Appendix A)** for the monitoring period.

Groundwater monitoring locations summarised by source area/area of interest and PFOS+PFHxS, PFOS and PFOA concentrations recorded during the monitoring period are presented in **Table 8** below.

Table 8 Summary of PFOS, PFOA and PFOS+PFHxS Concentrations in groundwater

Sampling Event	No. Sample Locations Analysed	Compound	Concentration Range (µg/L) in monitoring period	No. of Sample Locations with Concentrations > Laboratory Limit of reporting (LOR)	No. of Sample Locations Exceeding Freshwater and Marine 95% Species Protection guideline (HEPA, 2020)	No. of off-base Sample Locations Exceeding Drinking Water Guideline ² (HEPA, 2020)
A and West Sub-catchment						
October/November 2020	3	PFOS+PFHxS	<0.01 (MW217) – 0.26 (MW125S)	2	N/A ¹	0
		PFOS	<0.02 (MW217) – 0.04 (MW125I)	2	0	0
		PFOA	<0.01 (various) – <0.02 (MW217)	0	0	0
February – April 2021	3	PFOS+PFHxS	<0.01 (MW217) – 0.23 (MW125I)	2	N/A ¹	0
		PFOS	<0.01 (MW125S) – 0.05 (MW125I)	1	0	0
		PFOA	<0.01 (various) – <0.04 (MW217)	0	0	0
August 2021	3	PFOS+PFHxS	<0.1 (MW217) – 0.96 (MW125S)	2	N/A ¹	0
		PFOS	<0.01 (MW125S) – 0.03 (MW125I)	1	0	0
		PFOA	<0.01 (MW125I) – 0.01 (MW125S)	1	0	0
February – April 2022	3	PFOS+PFHxS	0.01 (MW217) – 1.37 (MW125S)	3	N/A ¹	0
		PFOS	<0.01 (MW217) – 0.03 (MW125I)	2	0	0
		PFOA	<0.01 (various) – 0.02 (MW125S)	1	0	0
August – October 2022	3	PFOS+PFHxS	0.01 (MW217) – 0.7 (MW125S)	3	N/A ¹	0
		PFOS	<0.01 (MW217) – 0.03 (MW125I)	2	0	0
		PFOA	<0.01 (various) – 0.01 (MW125S)	1	0	0
March 2023	3	PFOS+PFHxS	0.03 (MW217) – 0.6 (MW125I)	3	N/A ¹	0
		PFOS	0.2 (various)	3	0	0

Sampling Event	No. Sample Locations Analysed	Compound	Concentration Range (µg/L) in monitoring period	No. of Sample Locations with Concentrations > Laboratory Limit of reporting (LOR)	No. of Sample Locations Exceeding Freshwater and Marine 95% Species Protection guideline (HEPA, 2020)	No. of off-base Sample Locations Exceeding Drinking Water Guideline ² (HEPA, 2020)
		PFOA	<0.01 (various) – 0.01 (MW125I)	1	0	0
G and Central sub-catchment						
October/November 2020	21	PFOS+PFHxS	<0.01 (various) – 731 (MW128)	19	N/A ¹	1 (MW236S)
		PFOS	<0.01 (various) – 438 (MW128)	18	12	1 (MW236S)
		PFOA	<0.01 (various) – 17.8 (MW128)	12	0	0
February – April 2021	21	PFOS+PFHxS	<0.01 (various) – 1,300 (MW128)	17	N/A ¹	1 (MW236S)
		PFOS	<0.01 (various) – 876 (MW128)	16	9	1 (MW236S)
		PFOA	<0.01 (various) – 26.9 (MW128)	10	0	0
August 2021	21	PFOS+PFHxS	<0.01 (various) – 767 (MW128)	17	N/A ¹	2 (MW235S and MW236S)
		PFOS	<0.01 (various) – 461 (MW128)	16	12	2 (MW235S and MW236S)
		PFOA	<0.01 (various) – 19.4 (MW128)	11	0	0
February – April 2022	21	PFOS+PFHxS	<0.01 (various) – 150 (MW128)	16	N/A ¹	1 (MW236S)
		PFOS	<0.01 (various) – 96 (MW072)	15	12	1 (MW236S)
		PFOA	<0.01 (various) – 4.52 (MW128)	11	0	0
August – October 2022	21	PFOS+PFHxS	<0.01 (various) – 315 (MW128)	17	N/A ¹	1 (MW236S)
		PFOS	<0.01 (various) – 152 (MW128)	15	12	1 (MW236S)
		PFOA	<0.01 (various) – 8.35 (MW128)	12	0	0

Sampling Event	No. Sample Locations Analysed	Compound	Concentration Range (µg/L) in monitoring period	No. of Sample Locations with Concentrations > Laboratory Limit of reporting (LOR)	No. of Sample Locations Exceeding Freshwater and Marine 95% Species Protection guideline (HEPA, 2020)	No. of off-base Sample Locations Exceeding Drinking Water Guideline ² (HEPA, 2020)
March 2023	21	PFOS+PFHxS	<0.01 (various) – 127 (MW131)	17	N/A ¹	1 (MW236S)
		PFOS	<0.01 (various) – 76.3 (MW072)	17	12	1 (MW236S)
		PFOA	<0.01 (various) – 5.98 (MW131)	11	0	0
J/K and East sub-catchment						
October/November 2020	16	PFOS+PFHxS	0.04 (various) – 37.4 (MW018)	16	N/A ¹	3 (MW220S, MW226, MW232)
		PFOS	<0.01 (MW119) – 22.1 (MW018)	15	10	2 (MW226 and MW232)
		PFOA	<0.01 (various) – 1.12 (MW018)	9	0	0
February – April 2021	16	PFOS+PFHxS	0.02 (MW117D) – 36.6 (MW018)	16	N/A ¹	3 (MW220S, MW226, MW232)
		PFOS	<0.01 (various) – 22.8 (MW018)	12	8	1 (MW232)
		PFOA	<0.01 (various) – 1.32 (MW114)	8	0	0
August 2021	16	PFOS+PFHxS	<0.01 (MW117D) – 22.8 (MW117S)	15	N/A ¹	3 (MW220S, MW226, MW232)
		PFOS	<0.01 (various) – 7.47 (MW117S)	13	8	1 (MW226)
		PFOA	<0.01 (various) – 0.5 (MW117S)	8	0	0
February – April 2022	15	PFOS+PFHxS	0.03 (MW118) – 74.4 (MW018)	15	N/A ¹	3 (MW220S, MW226, MW232)
		PFOS	<0.01 (MW118) – 47.9 (MW018)	13	8	2 (MW226 and MW232)
		PFOA	<0.01 (various) – 1.88 (MW018)	7	0	0
August – October 2022	14	PFOS+PFHxS	0.03 (MW118) – 14.7 (MW114)	14	N/A ¹	3 (MW220S, MW226, MW232)
		PFOS	<0.01 (various) – 2.24 (MW018)	11	6	1 (MW232)
		PFOA	<0.01 (various) – 1.07 (MW114)	7	0	0

Sampling Event	No. Sample Locations Analysed	Compound	Concentration Range (µg/L) in monitoring period	No. of Sample Locations with Concentrations > Laboratory Limit of reporting (LOR)	No. of Sample Locations Exceeding Freshwater and Marine 95% Species Protection guideline (HEPA, 2020)	No. of off-base Sample Locations Exceeding Drinking Water Guideline ² (HEPA, 2020)
March 2023	14	PFOS+PFHxS	0.04 (MW118) – 64.4 (MW018)	14	N/A ¹	3 (MW220S, MW226, MW232)
		PFOS	<0.01 (MW116) – 38.4 (MW018)	13	9	1 (MW232)
		PFOA	<0.01 (various) – 2.02 (MW114)	8	0	0

¹ There is no applicable guidelines for PFOS+PFHxS in groundwater for the current scenarios.

² Where the guideline values refer to the sum of PFOS and PFHxS, this includes PFOS only, PFHxS only, as well as the sum of the two (HEPA, 2020).

Table 9 presents details of the first-time detections of PFOA, PFOS and PFOS+PFHxS or new exceedance of groundwater guidelines during the monitoring period, as well as new historical maximum or minimum concentrations.

Table 9 Summary of first-time detections, new exceedance of guidelines, and new historical minimums and maximums for PFOA, PFOS and PFOS+PFHxS in groundwater

Sampling Event	Compound	First-time Detection	New exceedance of guideline	New historical minimum	New historical maximum ¹
October 2020	PFOS+PFHxS	MW124 (0.01 µg/L) MW235S (0.02 µg/L)	None	MW002 (1.23 µg/L) MW065 (15.4 µg/L) MW102 (1.42 µg/L) MW115 (1.09 µg/L) MW122 (2.65 µg/L) MW205S (0.04 µg/L) MW217 (<0.01 µg/L)	MW101 (2.07 µg/L) MW114 (5.77 µg/L) MW116 (0.08 µg/L) MW117D (0.04 µg/L) MW118 (0.05 µg/L) MW120 (0.27 µg/L) MW121 (0.39 µg/L) MW125S (0.26 µg/L) MW125I (0.21 µg/L) MW138 (13.79 µg/L) MW220S (0.68 µg/L) MW232 (0.27 µg/L)
	PFOS	MW116 (0.01 µg/L) MW117D (0.02 µg/L) MW118 (0.01 µg/L) MW124 (0.01 µg/L) MW125S (0.02 µg/L) MW205S (0.02 µg/L) ³ MW220S (0.04 µg/L) ³ MW235S (0.02 µg/L) ³	MW120 (0.14 µg/L) ² MW232 (0.17 µg/L) ^{2,3}	MW002 (0.79 µg/L) MW122 (1.89 µg/L)	MW101 (1.27 µg/L) MW114 (0.48 µg/L) MW117S (3.32 µg/L) MW121 (0.06 µg/L) MW125I (0.04 µg/L) MW138 (7.6 µg/L)
	PFOA	None	None	MW065 (0.18 µg/L) MW102 (0.02 µg/L) MW114 (0.39 µg/L) MW122 (0.05 µg/L) MW135 (0.07 µg/L)	MW101 (0.04 µg/L) MW119 (0.05 µg/L)

Sampling Event	Compound	First-time Detection	New exceedance of guideline	New historical minimum	New historical maximum ¹
March/April 2021	PFOS+PFHxS	None	None	MW101 (0.68 µg/L) MW106 (0.12 µg/L) MW115 (0.78 µg/L) MW122 (0.16 µg/L) MW119 (0.03 µg/L) MW226 (0.08 µg/L) MW236S (0.17 µg/L)	MW002 (4.91 µg/L) MW114 (17.35 µg/L) MW120 (0.28 µg/L) MW125I (0.23 µg/L) MW128 (1,300 µg/L) MW135 (23.54 µg/L) MW138 (14.96 µg/L) MW139 (4.32 µg/L) MW220S (1.09 µg/L)
	PFOS	None	None	MW101 (0.34 µg/L) MW115 (0.46 µg/L) MW122 (0.1 µg/L) MW226 (0.03 µg/L) MW236S (0.09 µg/L)	MW105 (29.6 µg/L) MW114 (2.15 µg/L) MW117S (6.57 µg/L) MW125I (0.05 µg/L) MW128 (876 µg/L) MW135 (9.54 µg/L) MW138 (8.81 µg/L) MW139 (2.85 µg/L) MW220S (0.05 µg/L)
	PFOA	None	None	MW115 (<0.01 µg/L) MW122 (<0.01 µg/L)	MW114 (1.32 µg/L) MW119 (0.06 µg/L) MW123S (0.88 µg/L) MW135 (0.34 µg/L) MW138 (0.37 µg/L)
August 2021	PFOS+PFHxS	None	MW235S (0.15 µg/L)	MW114 (2.78 µg/L) MW115 (0.61 µg/L) MW117S (22.8 µg/L) MW123S (11.2 µg/L) MW141 (1.15 µg/L) MW232 (0.15 µg/L)	MW106 (0.35 µg/L) MW116 (0.13 µg/L) MW125S (0.96 µg/L)

Sampling Event	Compound	First-time Detection	New exceedance of guideline	New historical minimum	New historical maximum ¹
	PFOS	None	MW235S (0.12 µg/L)	MW114 (0.21 µg/L) MW115 (0.34 µg/L) MW141 (0.37 µg/L) MW232 (0.06 µg/L)	MW106 (0.1 µg/L) MW117S (7.47 µg/L) MW123S (3.24 µg/L)
	PFOA	MW125S (0.01 µg/L)	None	MW114 (0.2 µg/L) MW141 (0.04 µg/L)	MW102 (0.2 µg/L) MW138 (0.4 µg/L) MW119 (0.1 µg/L)
February – April 2022 [#]	PFOS+PFHxS	None	None	MW115 (0.56 µg/L) MW118 (0.03 µg/L) MW135 (2.82 µg/L)	MW018 (74.4 µg/L) MW125S (1.37 µg/L)
	PFOS	None	None	MW115 (0.2 µg/L) MW135 (1.78 µg/L)	MW018 (47.9 µg/L) MW116 (0.02 µg/L) MW123S (6.97 µg/L)
	PFOA	None	None	MW135 (0.05 µg/L)	MW018 (1.88 µg/L) MW119 (0.11 µg/L) MW125S (0.02 µg/L)
August – October 2022	PFOS+PFHxS	None	None	MW115 (0.26 µg/L) MW120 (0.16 µg/L) MW135 (1.18 µg/L) MW139 (2.66 µg/L)	MW131 (82.1 µg/L)
	PFOS	None	None	MW115 (0.1 µg/L) MW135 (0.55 µg/L)	MW121 (0.07 µg/L) MW131 (45.3 µg/L)
	PFOA	None	None	MW002 (0.01 µg/L) MW135 (0.02 µg/L) MW139 (0.03 µg/L)	MW131 (3.6 µg/L)

Sampling Event	Compound	First-time Detection	New exceedance of guideline	New historical minimum	New historical maximum ¹
March 2023	PFOS+PFHxS	MW233 (0.02 µg/L)	None	MW101 0.35 µg/L MW102 (0.84 µg/L) MW120 (0.11 µg/L) MW125S (0.15 µg/L) MW128 (8.8 µg/L)	MW002 (5.09 µg/L) MW106 (0.53 µg/L) MW114 (26.1 µg/L) MW121 (0.5 µg/L) MW123I (14.4 µg/L) MW131 (127 µg/L) MW138 (15.5 µg/L) MW125I (0.06 µg/L) MW217 (0.03 µg/L)
	PFOS	MW217 (0.02 µg/L) MW233 (0.02 µg/L)	MW106 (0.18 µg/L) ²	MW101 (0.2 µg/L) MW128 (6.05 µg/L)	MW002 (3.16 µg/L) MW114 (4.19 µg/L) MW121 (0.08 µg/L) MW135 (11.8 µg/L) MW131 (75.5 µg/L) MW205S (0.03 µg/L)
	PFOA	MW106 (0.01 µg/L) MW123I (0.06 µg/L) MW125I (0.01 µg/L)	None	MW101 (<0.01 µg/L) MW123S (0.37 µg/L) MW128 (0.15 µg/L)	MW114 (2.02 µg/L) MW119 (0.13 µg/L) MW131 (5.98 µg/L) MW138 (0.43 µg/L)

Note:

1. New historical maximum does not include first-time detections or new exceedance of guideline.
2. Freshwater and marine water (95% species protection values) exceeded.
3. Located in off-base Management Area

Concentrations of PFAS in the sample collected at MW117D during the February - April 2022 sampling have not been considered due to construction activities which led to destruction of the monitoring well and likely impacted sample integrity (refer in **Table 3**). In addition, sample collection deviated from the SAQP.

The first-time detections at MW124 (PFOS+PFHxS in October 2020) and MW125S (PFOA in August 2021) are equal to the laboratory LOR. Both monitoring wells are located on the northwestern base boundary. At MW124, all PFAS compounds returned concentrations below the laboratory LOR in the subsequent monitoring events from 2021 to 2023.

At MW125S, although PFOS was detected for the first time in November 2020 and PFOA in August 2021, other PFAS compounds have previously been detected in the monitoring well.

The first-time detection of PFOS at MW124 in November 2020 is considered an anomaly as PFOS has not been detected at this location since 2020.

The first-time detections for PFOS at MW116, MW117D, MW118, MW124, MW125S, MW205S, MW217, MW220S, MW233 and PFOA at MW106, MW123I and MW125S were equal to or close to the laboratory LOR and have continued to fluctuate over the monitoring period.

Concentrations of PFOS at MW235S have continued to fluctuate over the monitoring since the first-time detection in November 2020, followed by a historical maximum in August 2021 and the subsequent monitoring rounds of 2022 and 2023 reporting PFOS below the laboratory LOR. Similar fluctuations occurred for PFHxS.

It is noted that MW205S, MW220S and MW235S are located in the off-base Management Area.

There were no new exceedances of the drinking water guideline in off-base monitoring wells during the monitoring period, with the exception of MW235S in August 2021, as discussed above.

The new exceedance of the 95% species protection ecological guideline for PFOS in freshwater and marine ecosystems in MW120 (in October 2020), located on the northern base boundary, represents an order of magnitude increase in PFOS concentrations. A new exceedance of the nominated ecological guideline was also reported for PFOS at MW106 (in the Monocell source area) on March 2023 and in off-base well MW232 (in November 2020). It is noted that the sum of PFAS concentrations have remained relatively stable at these locations and continued to fluctuate over the monitoring period.

At MW232, located within the off-base management area, the new exceedance of the 95% species protection ecological guideline for freshwater and marine ecosystems for PFOS in November 2020 almost doubled. Concentrations at this location have continued to fluctuate by an order of magnitude over the monitoring period. PFAS concentrations at this location have fluctuated since 2018.

Concentrations of PFOS in MW120 and MW232 are consistent with other monitoring wells within the same sub-catchment.

New historical maximum concentrations were generally reported within the same order of magnitude and at concentrations close to previous maximum concentrations, except for PFOS+PFHxS at MW131 in August 2022 with resampling in October 2022 confirming the new historical maximum concentration. Subsequent sampling in March 2023 recorded a new historical maximum concentration at this location. Concentrations of PFOS+PFHxS were an order of magnitude higher in March 2023 than in previous sampling events. These changes in concentrations are further discussed in **Section 8.2**.

New historical maximum concentrations were reported in MW018 for PFOS, PFOS+PFHxS and PFOA in March 2022 with the results decreasing by an order of magnitude in August 2022. Seasonal variability has been observed in the concentrations reported for this well between March 2021 and March 2023 indicating concentrations in the wet season tending to be an order of magnitude higher than dry season concentrations.

Historical groundwater concentrations of PFOS+PFHxS and PFOA have been displayed graphically, by catchment area, in **Appendix C** for the locations presented in **Table 10**, and represent the discussion of groundwater analytical results presented above.

Table 10 Groundwater Temporal trend graphs by Catchment Area

Plate ID of Appendix C	Sub-catchment Area	Monitoring Wells
Plate 1 and 2	Catchment A and West sub-catchment	MW125S, MW125I, MW217
Plate 3 to 8	Catchment G and Central sub-catchment: source area/area of interest	MW105, MW128, MW131, MW102, MW065, MW120, MW121, MW122, MW123S, MW123I, MW072, MW074, MW101, MW138
Plate 9 and 10	Catchment G and Central sub-catchment: base boundary	MW003, MW124
Plate 11 and 12	Catchment G and Central sub-catchment: Off-base Management Area	MW205S, MW212, MW233, MW235S, MW236S
Plate 13 and 14	Catchment J/K and East sub-catchment: source area/area of interest	MW018, MW114, MW115, MW116, MW139, MW135, MW106, MW141
Plate 15 and 16	Catchment J/K and East sub-catchment: base boundary	MW002, MW117S/D, MW118, MW119
Plate 17 and 18	Catchment J/K and East sub-catchment: Off-base Management Area	MW220S, MW226, MW232

7.2 Surface Water

7.2.1 Geochemical Parameters

Surface water geochemical parameters were measured prior to collecting samples. Current and historical field observations and geochemical parameters are presented in **Table T3, Appendix B** and summarised in **Table 11** for the monitoring period. The water quality parameters recorded during the monitoring period are consistent with the historical data set.

Table 11 Summary – Surface Water Geochemical Parameters

Parameter	DO (mg/L)	EC (µS/cm)	pH (pH units)	Corrected ORP (mV) ¹	Temperature (°C)
October 2020 (Dry Season)					
Minimum	1.92	186.9	6.53	136.9	26.6
Maximum	13.35	64,101.0	8.63	250.0	34.7
March /April 2021 (Wet Season)					
Minimum	2.72	138.4	6.79	198.2	22.9
Maximum	11.81	39,099.0	9.92	381.2	36.0
August 2021 (Dry Season)					
Minimum	0.31	251.8	6.42	142.0	21.3
Maximum	12.3	48,932.0	9.15	416.1	25.4
February – April 2022 (Wet Season)					
Minimum	0.92	39.1	6.67	181.1	23.4
Maximum	11.71	49,925.0	8.91	386.0	37.3
August – October 2022 (Dry Season)					
Minimum	1.87	190.5	6.9	145.5	15.1
Maximum	12.66	43,042.0	8.96	322.4	26.9

Parameter	DO (mg/L)	EC ($\mu\text{S/cm}$)	pH (pH units)	Corrected ORP (mV) ¹	Temperature ($^{\circ}\text{C}$)
March 2023 (Wet Season)					
Minimum	2.14	3.1	6.42	180.9	26.6
Maximum	9.35	10,695.0	8.88	415.3	32.6

Note: 1 – Oxidation-reduction potential measured in millivolts (mV) and corrected values calculated by the addition of an offset voltage of 194 mV (for reference electrode Ag/AgCl).

The readings from the monitoring period indicate:

- Poor to well oxygenated conditions
- Fresh to saline conditions
- Slightly acidic to slightly alkaline conditions
- Mildly to strongly reducing conditions.

7.2.2 Surface Water Analytical Results

All surface water analytical results for the monitoring period are presented in **Table T4 (Appendix B)**. Monitoring locations are presented in **Figure F3 (Appendix A)** and PFOS+PFHxS and PFOA concentration maps are presented in **Figure F22 to F33 (Appendix A)**.

Surface water monitoring locations summarised by source area/area of interest and PFOS+PFHxS, PFOS and PFOA concentrations recorded during the monitoring period are summarised in **Table 12** below.

Table 12 Summary of PFOS, PFOA and PFOS+PFHxS Concentrations in Surface Water

Sampling Event	No. Sample Locations Analysed	Compound	Concentration Range (µg/L) in monitoring period	No. of Sample Locations with Concentrations > Laboratory LOR	No. of Sample Locations Exceeding Freshwater and Marine 95% Species Protection guideline (HEPA, 2020)	No. of Sample Locations Exceeding Recreational water quality guideline (NHMRC, 2019)	No. of Sample Locations Exceeding Drinking Water Guideline ² (HEPA, 2020)
A and west sub-catchment							
October 2020	1	PFOS+PFHxS	<0.01 – 0.01 (SW217)	1	N/A ¹	0	N/A
		PFOS	<0.01 – 0.01 (SW217)	1	0	0	N/A
		PFOA	<0.01 (SW217)	0	0	0	N/A
March – June 2021	2	PFOS+PFHxS	<0.01 (SW126) – 0.05 (SW217)	1	N/A ¹	0	N/A
		PFOS	<0.01 (SW126) – 0.02 (SW217)	1	0	0	N/A
		PFOA	<0.01 (various)	0	0	0	N/A
August 2021	1	PFOS+PFHxS	<0.01 (SW217)	0	N/A ¹	0	N/A
		PFOS	<0.01 (SW217)	0	0	0	N/A
		PFOA	<0.01 (SW217)	0	0	0	N/A
February – April 2022	2	PFOS+PFHxS	<0.01 (SW126) – 0.01 (SW217)	1	N/A	0	N/A
		PFOS	<0.01 (SW126) – 0.01 (SW217)	1	0	0	N/A
		PFOA	<0.01 (various)	0	0	0	N/A
August – October 2022	1	PFOS+PFHxS	0.04 (SW217)	1	N/A	0	N/A
		PFOS	0.02 (SW217)	1	0	0	N/A
		PFOA	<0.01 (SW217)	0	0	0	N/A
March 2023	2	PFOS+PFHxS	<0.01 (SW126) – 0.06 (SW217)	1	N/A	0	N/A
		PFOS	<0.01 (SW126) – 0.02 (SW217)	1	0	0	N/A
		PFOA	<0.01 (various)	0	0	0	N/A

Sampling Event	No. Sample Locations Analysed	Compound	Concentration Range (µg/L) in monitoring period	No. of Sample Locations with Concentrations > Laboratory LOR	No. of Sample Locations Exceeding Freshwater and Marine 95% Species Protection guideline (HEPA, 2020)	No. of Sample Locations Exceeding Recreational water quality guideline (NHMRC, 2019)	No. of Sample Locations Exceeding Drinking Water Guideline ² (HEPA, 2020)
G and central sub-catchment							
October 2020	9	PFOS+PFHxS	<0.01 (SW134) – 2.52 (SW140)	6	N/A ¹	1	N/A
		PFOS	<0.01 (SW134) – 1.63 (SW140)	8	5	0	N/A
		PFOA	<0.01 (various) – 0.06 (SW140)	6	0	0	N/A
March – June 2021	15	PFOS+PFHxS	<0.01 (SW134) – 127.9 (SW109)	14	N/A ¹	4	N/A
		PFOS	<0.01 (SW134) – 72.5 (SW109)	14	9	1	N/A
		PFOA	<0.01 (various) – 5.61 (SW109)	9	0	0	N/A
August 2021	9	PFOS+PFHxS	<0.01 (various) – 3.06 (SW139)	6	N/A ¹	2	N/A
		PFOS	<0.01 (various) – 1.78 (SW139)	6	4	0	N/A
		PFOA	<0.01 (various) – 0.1 (SW139)	5	0	0	N/A
February – April 2022	16 ³	PFOS+PFHxS	<0.01 (SW134) – 192 (SW109)	15	N/A ¹	1	N/A
		PFOS	<0.01 (SW134) – 89.2 (SW109)	15	6	1	N/A
		PFOA	<0.01 (various) – 11.3 (SW109)	7	0	1	N/A
August – October 2022	10 ⁴	PFOS+PFHxS	0.02 (SW211) – 165 (SW109)	10	N/A ¹	2	N/A
		PFOS	0.01 (SW212) – 109 (SW109)	10	6	2	N/A
		PFOA	<0.01 (various) – 6.36 (SW109)	9	0	0	N/A
March 2023	16	PFOS+PFHxS	<0.01 (SW134) – 134 (SW109)	15	N/A ¹	3	N/A
		PFOS	<0.01 (SW134) – 82.2 (SW109)	15	10	2	N/A
		PFOA	<0.01 (various) – 4.82 (SW109)	10	0	0	N/A

Sampling Event	No. Sample Locations Analysed	Compound	Concentration Range (µg/L) in monitoring period	No. of Sample Locations with Concentrations > Laboratory LOR	No. of Sample Locations Exceeding Freshwater and Marine 95% Species Protection guideline (HEPA, 2020)	No. of Sample Locations Exceeding Recreational water quality guideline (NHMRC, 2019)	No. of Sample Locations Exceeding Drinking Water Guideline ² (HEPA, 2020)
J/K and east sub-catchment							
October 2020	8	PFOS+PFHxS	0.01 (SW243) – 3.32 (SW121)	8	N/A ¹	2	N/A
		PFOS	0.01 (SW243) – 1.19 (SW121)	8	5	0	N/A
		PFOA	<0.01 (various) – 0.09 (SW121)	4	0	0	N/A
March – June 2021	10	PFOS+PFHxS	0.02 (SW243) – 5.64 (SW135)	10	N/A ¹	1	N/A
		PFOS	0.02 (SW243) – 3.62 (SW135)	10	5	1	N/A
		PFOA	<0.01 (various) – 0.07 (SW135)	5	0	0	N/A
August 2021	7	PFOS+PFHxS	<0.01 (SW243) – 6.66 (SW121)	6	N/A ¹	1	N/A
		PFOS	<0.01 (SW243) – 1.14 (SW121)	6	4	0	N/A
		PFOA	<0.01 (various) – 0.22 (SW121)	3	0	0	N/A
February – April 2022	10	PFOS+PFHxS	<0.01 (SW243) – 1.96 (SW220)	9	N/A ¹	0	N/A
		PFOS	<0.01 (SW243) – 0.91 (SW220)	9	5	0	N/A
		PFOA	<0.01 (various) – 0.04 (SW220)	3	0	0	N/A
August – October 2022	7	PFOS+PFHxS	0.03 (SW243) – 2.08 (SW220)	7	N/A ¹	1	N/A
		PFOS	0.02 (SW243) – 0.74 (SW220)	7	3	0	N/A
		PFOA	<0.01 (various) – 0.05 (SW121)	2	0	0	N/A
March 2023	8	PFOS+PFHxS	0.06 (SW243) – 1.48 (SW119)	8	N/A ¹	0	N/A
		PFOS	0.04 (SW243) – 0.68 (SW119)	8	5	0	N/A
		PFOA	<0.01 (various) – 0.06 (various)	3	0	0	N/A

Sampling Event	No. Sample Locations Analysed	Compound	Concentration Range (µg/L) in monitoring period	No. of Sample Locations with Concentrations > Laboratory LOR	No. of Sample Locations Exceeding Freshwater and Marine 95% Species Protection guideline (HEPA, 2020)	No. of Sample Locations Exceeding Recreational water quality guideline (NHMRC, 2019)	No. of Sample Locations Exceeding Drinking Water Guideline ² (HEPA, 2020)
Ross River							
October 2020	3	PFOS+PFHxS	<0.01 (various)	0	N/A ¹	0	0
		PFOS	<0.01 (various) – <0.02 (SW244)	0	0	0	0
		PFOA	<0.01 (various)	0	0	0	0
March – June 2021	3	PFOS+PFHxS	<0.01 (various)	0	N/A ¹	0	0
		PFOS	<0.01 (various)	0	0	0	0
		PFOA	<0.01 (various)	0	0	0	0
August 2021	3	PFOS+PFHxS	<0.01 (various)	0	N/A ¹	0	0
		PFOS	<0.01 (various)	0	0	0	0
		PFOA	<0.01 (various)	0	0	0	0
February – April 2022	3	PFOS+PFHxS	<0.01 (various)	0	N/A ¹	0	0
		PFOS	<0.01 (various)	0	0	0	0
		PFOA	<0.01 (various)	0	0	0	0
August – October 2022	3	PFOS+PFHxS	<0.01 (various)	0	N/A ¹	0	0
		PFOS	<0.01 (various)	0	0	0	0
		PFOA	<0.01 (various)	0	0	0	0

Sampling Event	No. Sample Locations Analysed	Compound	Concentration Range (µg/L) in monitoring period	No. of Sample Locations with Concentrations > Laboratory LOR	No. of Sample Locations Exceeding Freshwater and Marine 95% Species Protection guideline (HEPA, 2020)	No. of Sample Locations Exceeding Recreational water quality guideline (NHMRC, 2019)	No. of Sample Locations Exceeding Drinking Water Guideline ² (HEPA, 2020)
March 2023	3	PFOS+PFHxS	<0.01 (various)	0	N/A ¹	0	0
		PFOS	<0.01 (various)	0	0	0	0
		PFOA	<0.01 (various)	0	0	0	0

N/A – not applicable

¹ There is no applicable freshwater or marine water ecological guideline for PFOS+PFHxS.

² Drinking water screening criteria are only applicable to results from SW245, as this is the only surface water location within an emergency drinking water supply for Townsville and is upgradient of Blacks Weir and not tidally influenced (refer **Section 5.0**).³ Location SW110 was resampled after the main sampling round to confirm concentrations. Both samples (collected 1 March 2022 and 26 April 2022) have been deemed representative of this location and have been included in this summary.

⁴ Location SW110 was resampled after the main sampling round to confirm concentrations. Both samples (collected 22 August 2022 and 7 October 2022) have been deemed representative of this location and have been included in this summary.

Table 13 presents details of the first-time detections of PFOS+PFHxS and PFOA or new exceedance of guidelines during the monitoring period, as well as new historical maximum or minimum concentrations.

Table 13 Summary of first-time detections and new exceedance of guidelines, and new historical minimums and maximums for PFOA and PFOS+PFHxS in surface water

Sampling Event	Compound	First-time Detection	New exceedance of guideline	New historical minimum	New historical maximum ¹
October 2020	PFOS+PFHxS	None	SW119 (2.43 µg/L) ² SW121 (3.32 µg/L) ²	SW212 (0.06 µg/L) SW233 (0.42 µg/L)	SW113 (0.41 µg/L) SW135 (0.68 µg/L) SW232 (0.09 µg/L)
	PFOS	None	SW113 (0.22 µg/L) ³ SW130 (0.13 µg/L) ³	SW119 (0.77 µg/L) SW211 (0.03 µg/L) SW212 (0.02 µg/L) SW233 (0.24 µg/L)	SW121 (1.19 µg/L) SW129 (0.055 µg/L) SW135 (0.52 µg/L) SW232 (0.09 µg/L) SW242 (0.06 µg/L)
	PFOA	SW113 (0.03 µg/L)	None	None	SW119 (0.07 µg/L) SW121 (0.09 µg/L)
March/April 2021	PFOS+PFHxS	None	SW135 (5.64 µg/L) ² SW139 (2.4 µg/L) ²	SW119 (0.75 µg/L) SW144 (0.13 µg/L) SW211 (0.03 µg/L)	SW109 (127.9 µg/L) SW120 (0.29 µg/L) SW129 (0.6 µg/L) SW130 (1.27 µg/L) SW217 (0.05 µg/L) SW220 (1.25 µg/L) SW232 (0.1 µg/L) SW233 (1.13 µg/L) SW242 (0.13 µg/L)
	PFOS	None	SW129 (0.29 µg/L)	SW119 (0.42 µg/L)	SW109 (72.5 µg/L) SW120 (0.12 µg/L) SW130 (0.69 µg/L) SW135 (3.62 µg/L) SW139 (1.6 µg/L) SW217 (0.02 µg/L) SW220 (0.52 µg/L) SW233 (0.69 µg/L)

Sampling Event	Compound	First-time Detection	New exceedance of guideline	New historical minimum	New historical maximum ¹
	PFOA	SW130 (0.03 µg/L) SW135 (0.07 µg/L)	None	SW119 (0.02 µg/L)	SW109 (5.61 µg/L) SW129 (0.03 µg/L) SW132 (0.08 µg/L) SW139 (0.1 µg/L) SW233 (0.03 µg/L)
August 2021	PFOS+PFHxS	None	None	SW211 (<0.01 µg/L) SW232 (0.01 µg/L)	SW121 (6.66 µg/L) SW139 (3.06 µg/L) SW220 (1.77 µg/L) SW233 (1.18 µg/L)
	PFOS	None	None	SW119 (0.41 µg/L) SW211 (<0.01 µg/L)	SW139 (1.78 µg/L) SW220 (0.54 µg/L)
	PFOA	SW212 (0.02 µg/L) ⁴	None	None	SW121 (0.22 µg/L) SW220 (0.04 µg/L) SW233 (0.05 µg/L)
February – April 2022	PFOS+PFHxS	SW133 (0.08 µg/L) ^	None	SW110 (0.03 µg/L) ⁵ SW120 (0.09 µg/L) SW139 (0.86 µg/L) SW212 (0.04 µg/L)	SW109 (192 µg/L) SW220 (1.96 µg/L)
	PFOS	SW133 (0.04 µg/L) ^	None	SW110 (0.02 µg/L) ⁵ SW119 (0.28 µg/L) SW120 (0.04 µg/L) SW129 (0.03 µg/L) SW139 (0.55 µg/L)	SW109 (89.2 µg/L) SW220 (0.91 µg/L) SW242 (0.08 µg/L)
	PFOA	None	None	SW110 (<0.01 µg/L) ⁵ SW139 (0.03 µg/L)	SW109 (11.3 µg/L)
August – October 2022	PFOS+PFHxS	None	SW220 (2.08 µg/L) ^{2,4}	SW144 (0.12 µg/L)	SW110 (50.5 µg/L) SW233 (1.36 µg/L)
	PFOS	None	None	SW113 (0.05 µg/L) SW144 (0.05 µg/L) SW212 (0.01 µg/L)	SW109 (109 µg/L) SW110 (32.9 µg/L) ⁶
	PFOA	None	None	None	SW110 (1.51 µg/L) ⁶

Sampling Event	Compound	First-time Detection	New exceedance of guideline	New historical minimum	New historical maximum ¹
March 2023	PFOS+PFHxS	None	None	None	SW110 (70.2 µg/L) SW128 (0.34 µg/L) SW133 (0.67 µg/L) SW203 (1.8 µg/L) SW205 (0.09 µg/L) SW211 (0.09 µg/L) SW212 (0.28 µg/L) SW217 (0.06 µg/L) SW232 (0.19 µg/L) SW233 (1.93 µg/L) SW242 (0.41 µg/L)
	PFOS	None	SW128 (0.13 µg/L) ³ SW133 (0.26 µg/L) ³ SW242 (0.25 µg/L) ^{3, 4}	None	SW110 (36.9 µg/L) SW144 (0.11 µg/L) SW203 (1.05 µg/L) SW205 (0.09 µg/L) SW233 (1.12 µg/L)
	PFOA	SW133 (0.01 µg/L)	None	None	SW110 (2.67 µg/L) SW129 (0.04 µg/L) SW203 (0.04 µg/L) SW233 (0.06 µg/L)

Note:

1. New historical maximum does not include first-time detections or new exceedance of guideline.
2. HEPA (2020) Recreation use criteria exceeded
3. HEPA (2020) Freshwater and marine water (95% species protection values) criteria exceeded
4. Located in off-base Management Area
5. New maximum concentrations were reported in March 2022. The location was resampled after the main sampling round to confirm concentrations. The result presented is the result from re-sampling on 26 April 2022 which were lower than the March 2022 results and therefore not tabulated as new maximum concentrations.
6. New maximum concentrations were reported in August 2022. Location was resampled after the main sampling round to confirm concentrations. The result presented is the result from resampling completed in October 2022 which were lower than the August 2022 results but still higher than previous concentrations.^ No historical data are available for this sampling location. The first-time detection is also the first sample collected at this location.

PFAS concentrations in surface water samples collected from the A and West sub-catchment were reported at below the laboratory LOR or at low concentrations below the adopted guidelines during the monitoring period.

Within the G and Central sub-catchment, one location (SW130) collected on-base from the northern boundary recorded a first-time detection of PFOA (0.03 µg/L) close to the laboratory LOR in March 2021, subsequent rounds of sampling have not continued to report PFOA at SW130 in 2022 and 2023. A new historical maximum concentration of PFOS was recorded at this location in March 2021 however the results have not been replicated in the April 2022 and March 2023 monitoring rounds. Concentrations of PFAS in surface water from SW109 and SW110 recorded new historical maximum during the monitoring period and concentrations continue to fluctuate.

One off-base location (SW212) recorded a first-time detection of PFOA (0.02 µg/L) in August 2021. It is noted other PFAS compounds have been historically detected at this location and the concentrations continue to fluctuate close the laboratory LOR.

Within the J/K and East sub-catchment, two on-base locations near the north-eastern boundary (SW121 and SW135) exceeded the recreational use guideline value for PFOS+PFHxS during the monitoring period, as follows:

- SW121 exceeded the recreational use guideline value in October 2020. PFAS concentrations have been showing seasonal variation, since 2018. Concentrations in 2022 were reported below the recreational use guideline value.
- SW135 reported a new exceedance of the recreational use guideline value in March 2021 sampling event with concentrations decreasing below the guideline value in the subsequent monitoring event in August 2021. SW135 also recorded a first-time detection of PFOA (0.07 µg/L) in March 2021. PFOA concentrations returned to non-detect concentrations in the subsequent monitoring events.

Within the J/K and East sub-catchment, one on-base location (SW113) collected from down gradient of the Monocell recorded a first-time detection of PFOA (0.03 µg/L) and a new exceedance of the adopted ecological guideline value for PFOS in October 2020. PFOA concentrations returned to non-detect concentrations and PFOS concentrations returned to below the adopted ecological criteria in the subsequent March 2021 sampling event and the 2022 and 2023 monitoring events.

One new exceedance of PFOS+PFHxS at SW220 exceeded the recreational use guideline value for the first-time in August 2022, with concentrations fluctuating since 2018 and reported below the guideline in March 2023. Downgradient surface water monitoring locations SW242 and SW232 did not exceed the recreational use guideline.

New historical maximum concentrations in 2022 and 2023 were generally reported within the same order of magnitude as the historical results and in most cases at concentrations close to previous maximum concentrations. Where increases were recorded across the monitoring period, subsequent monitoring rounds have generally resulted in results being back within the historical range of concentrations for these locations. These changes in concentrations are inferred to be the result of seasonal fluctuations.

Historical surface water concentrations of PFOS+PFHxS and PFOA have been displayed graphically on temporal trend graphs, by catchment area, in **Appendix C** for the locations identified in **Table 14**.

Table 14 Surface Water Temporal trend graphs by Catchment Area

Plate ID in Appendix C	Sub-catchment Area	Surface water locations
2.1, Plates 19 and 20	A and West sub-catchment	SW126, SW217
2.2.1, Plates 21 and 22	G and Central sub-catchment: source area/area of interest	SW109, SW110, SW129, SW130, SW139, SW140, SW144
2.2.2, Plates 32 and 24	G and Central sub-catchment: Boundary conditions	SW128, SW132, SW133, SW134
2.2.3, Plates 25 and 26	G and Central sub-catchment: Off-base Management Area	SW203, SW205, SW211, SW212, SW233
2.3.1, Plates 27 and 28	J/K and East sub-catchment: source area/area of interest	SW113, SW119, SW120
2.3.2, Plates 29 and 30	J/K and East sub-catchment: Boundary conditions	SW121, SW135, SW136
2.3.3, Plates 31 and 32	J/K and East sub-catchment: Off-base Management Area	SW220, SW232, SW242, SW243
2.4, Plates 33 and 24	Ross River	SW227, SW244, SW245

PFAS concentrations in surface water samples collected from the A and West, G and Central and J/K and East sub-catchments were generally stable except for some key locations discussed further in **Section 8.3**.

PFAS concentration in samples collected from the Ross River were reported below the laboratory LOR and below the adopted human health and ecological guidance values.

7.3 Sediment

7.3.1 Field Observations

Field observations recorded during collection of sediments are presented in **Table T5 (Appendix B)**. Sediments generally comprised a combination of fine to coarse grained sand and gravel, low to medium plasticity clay, silt, and some cobbles, with varying organic content (including grass, roots, leaves and surface algae). These observations are generally consistent across the monitoring period.

7.3.2 Sediment Analytical Results

Available sediment analytical results are presented in **Table T6 (Appendix B)**. Monitoring locations are presented in **Figure F3 (Appendix A)** and PFOS+PFHxS and PFOA concentration maps are presented in **Figure F33 to F45 (Appendix A)**.

PFOS, PFOA and PFOS+PFHxS concentrations recorded during the monitoring period are summarised in **Table 15** below.

Table 15 Summary of PFOS, PFOA and PFOS+ PFHxS Concentrations in Sediment

Sampling Event	No. Sample Locations Analysed	Compound	Concentration Range (mg/kg)	No. of Sample Locations with Concentrations > Laboratory LOR
October 2020	29	PFOS+PFHxS	<0.0002 (various) – 0.0692 (SD121)	21
	29	PFOS	<0.0002 (various) – 0.0461 (SD121)	21
	29	PFOA	<0.0002 (various) – 0.0016 (SD121)	4
March/April 2021	31	PFOS+PFHxS	<0.0002 (SD227, SD244, SD245) – 0.361 (SD144)	28
	31	PFOS	<0.0002 (SD227, SD244, SD245) – 0.356 (SD144)	28
	31	PFOA	<0.0002 (various) – 0.001 (SD109)	6
August 2021	30	PFOS+PFHxS	<0.0002 (SD126, SD227, SD244, SD245) – 0.127 (SD109)	26
	30	PFOS	<0.0002 (SD126, SD227, SD244, SD245) – 0.122 (SD109)	26
	30	PFOA	<0.0002 (various) – 0.0018 (SD119)	8
February – April 2022	31	PFOS+PFHxS	<0.0002 (various) – 0.371 (SD109)	22
	31	PFOS	<0.0002 (various) – 0.253 (SD109)	22
	31	PFOA	<0.0002 (various) – 0.0076 (SD109)	3
August – October 2022	31	PFOS+PFHxS	<0.0002 (various) – 0.596 (SD109)	25
	31	PFOS	<0.0002 (various) – 0.566 (SD109)	25
	31	PFOA	<0.0002 (various) – 0.005 (SD109)	3
March 2023	31	PFOS+PFHxS	<0.0002 (various) – 0.410 (SD109)	26
	31	PFOS	<0.0002 (various) – 0.377 (SD109)	26
	31	PFOA	<0.0002 (various) – 0.0032 (SD109)	8

Table 16 presents details of the first-time detections of PFOS+PFHxS, and PFOA during the monitoring period as well as new historical maximum and minimum concentrations reported.

Table 16 Summary – First-time detections and new historical minimums and maximums of PFOA and PFOS+PFHxS in sediment

Sampling Event	Compound	First-time Detection	New historical minimum	New historical maximum ¹
October 2020	PFOS+PFHxS	SD113 (0.0005 mg/kg) SD119 (0.0333 mg/kg) SD121^ (0.0565 mg/kg) SD126^ (0.0003 mg/kg) SD128^ (0.001 mg/kg) SD129^ (0.0005 mg/kg) SD130^ (0.0021 mg/kg) SD133^ (0.0007 mg/kg) SD134^ (0.0003 mg/kg) SD135 (0.0005 mg/kg) SD136 (0.0018 mg/kg) SD212 (0.005 mg/kg) ² SD233 (0.0022 mg/kg) SD242 (0.0010 mg/kg) ²	SD109 (0.0374 mg/kg) SD110 (0.0417 mg/kg) SD132 (0.0039 mg/kg) SD203 (<0.0002 mg/kg) ² SD220 (0.0155 mg/kg) ²	SD139 (0.0481 mg/kg) SD232 (0.0025 mg/kg) ²
	PFOA	SD119 (0.0011 mg/kg) SD121^ (0.0016 mg/kg)	SD109 (0.0007 mg/kg) SD110 (0.0012 mg/kg)	None
March/April 2021	PFOS+PFHxS	SD120 (0.0014 mg/kg) SD144^ (0.365 mg/kg) SD205^ (0.007 mg/kg) ² SD211 (0.0015 mg/kg) ² SD243 (0.0009 mg/kg) ²	SD110 (0.009 mg/kg) SD119 (0.0009 mg/kg) SD121 (0.0277 mg/kg) SD132 (0.0037 mg/kg)	SD113 (0.0012 mg/kg) SD128 (0.0044 mg/kg) SD130 (0.0095 mg/kg) SD133 (0.001 mg/kg) SD134 (0.0018 mg/kg) SD135 (0.0031 mg/kg) SD136 (0.0059 mg/kg) SD139 (0.0894 mg/kg) SD140 (0.0547 mg/kg) SD220 (0.1031 mg/kg) ² SD233 (0.029 mg/kg) ² SD242 (0.0034 mg/kg) ²
	PFOA	SD139 (0.0005 mg/kg) SD140 (0.0004 mg/kg) SD233 (0.0002 mg/kg) ²	SD110 (0.0002 mg/kg) SD121 (0.004 mg/kg)	None

Sampling Event	Compound	First-time Detection	New historical minimum	New historical maximum ¹
August 2021	PFOS+PFHxS	None	SD121 (0.0194 mg/kg) SD126 (<0.0002 mg/kg) SD144 (0.006 mg/kg) SD212 (0.0002 mg/kg) ²	SD119 (0.0365 mg/kg) SD120 (0.0037 mg/kg) SD129 (0.0007 mg/kg) SD136 (0.0122 mg/kg)
	PFOA	SD136 (0.0002 mg/kg) SD205 (0.0002 mg/kg) ² SD220 (0.0003 mg/kg) ²	None	SD119 (0.0018 mg/kg)
February – April 2022	PFOS+PFHxS	None	SD121 (0.0095 mg/kg) SD129 (0.0004 mg/kg) SD133 (0.0006 mg/kg) SD134 (<0.0002 mg/kg) SD212 (<0.0002 mg/kg) ² SD220 (0.005 mg/kg) ²	SD109 (0.371 mg/kg) * SD110 (0.191 mg/kg)
	PFOA	None	SD121 (<0.0002 mg/kg)	SD109 (0.0076 mg/kg) SD110 (0.0017 mg/kg)
August – October 2022	PFOS+PFHxS	None	None	SD109 (0.596 mg/kg) * SD126 (0.0036 mg/kg) SD129 (0.0012 mg/kg) SD133 (0.002 mg/kg) SD242 (0.0053 mg/kg) ²
	PFOA	None	None	SD121 (0.002 mg/kg)

Sampling Event	Compound	First-time Detection	New historical minimum	New historical maximum ¹
March 2023	PFOS+PFHxS	None	None	SD120 (0.0042 mg/kg) SD121 (0.118 mg/kg) SD128 (0.0131 mg/kg) SD129 (0.0014 mg/kg) SD133 (0.0123 mg/kg) SD139 (0.101 mg/kg) SD232 (0.0035 mg/kg) ²
	PFOA	SD144 (0.0012 mg/kg) SD128 (0.0002 mg/kg)	None	SD139 (0.0017 mg/kg)

Note:

1. New historical maximum concentrations do not include first-time detections.
 2. Located in off-base Management Area.
- ^ No historical data are available for this sediment sampling location. The first-time detection is also the first sample collected at this location.

In October 2020, of the six locations with historical data that had first-time detects of PFOS+PFHxS, five were located within the J/K and East sub-catchment (SD113, SD119, SD135, SD136 and SD242) and one was located with the G and Central sub-catchment (SD233). Three of these locations reported PFOS+PFHxS concentrations, one or more orders of magnitude above the laboratory LOR:

- SD119 (with a detection of 0.0333 mg/kg) located on-base, within J/K and East sub-catchment, near the north-eastern Base boundary reported a new historical maximum in October 2020. Subsequent monitoring at this location reported a new historical maximum in August 2021 followed by a reduction in the order of magnitude of reported results to May 2023.
- SD136 (with a detection of 0.0018 mg/kg) is located on-base, within J/K and East sub-catchment, near the north-eastern Base boundary. PFOS+PFHxS concentrations at the co-located surface water sample were also above the historical range in July 2019. Concentrations of PFOS+PFHxS and sum of PFAS at this location continue to fluctuate and further monitoring as part of the OMP is required to understand longer term trends. Similar observations are made of SD113, SD135 and SD242 where concentrations have fluctuated across the monitoring period since the initial detection in October/November 2020.
- SD233 (with a detection of 0.0022 mg/kg) is located within the off-base Management Area in G and Central sub-catchment. Concentrations increased initially but were reported back within the historical range in the most recent sampling event in March 2023.

In March/April 2021, of the four locations with historical data that had first-time detects of PFOS+PFHxS, two were located within the J/K and East sub-catchment (SD120 and SD243) and two were located with the G and Central sub-catchment (SD211 and SD212). Three of these locations reported concentrations, one order of magnitude above the laboratory LOR:

- SD120 (with a detection of 0.0014 mg/kg) is located on-base, near the north-eastern Base boundary. PFOS+PFHxS and PFOA concentrations in the co-located surface water sample (SW120) fluctuated between 2018 and 2022 but remain below the recreational criteria.
- SD243 (with a detection of 0.0009 mg/kg) is located within the off-base Management Area. Fluctuating concentrations of PFAS (within an order of magnitude) have been observed in the results within the monitoring period for this location. PFAS has historically been detected in the co-located surface water sample (SW243) and PFOS+PFHxS concentrations at SW243 remained within the historical range during the monitoring period.
- SD211 (with a detection of 0.0015 mg/kg) and SD212 (0.005 mg/kg) are both located within the off-base Management Area. PFOS+PFHxS and PFOA concentrations in the co-located surface water samples (SW211 and SW212) remained below or close to LOR throughout the monitoring period with similar observations true for the sediment samples at these locations.

All first-time detections of PFOA were close to the laboratory LOR with the exception of SD119 (0.0011 mg/kg) in October 2020. As discussed above, there has been a reduction in the magnitude of the concentrations of PFAS at this location and PFOA results for the last three sampling events have been reported below the LOR.

New historical maximum concentrations were generally reported within the same order of magnitude and at concentrations close to previous maximum concentrations or close to the laboratory limit of reporting. Where increases were recorded in the early monitoring rounds of October 2020 and March/April 2021, concentrations in the subsequent monitoring rounds were generally back within the historical range of concentrations for these locations.

First-time detections of PFOS+PFHxS and PFOA at some locations in October 2020 and October 2021 were attributed to the first-time these locations were sampled. The applicable sediment locations to which this applies are annotated in the table above.

8.0 Interpretive Analysis

8.1 Hydrogeology

The SWLs were measured in the groundwater monitoring wells to evaluate the groundwater elevations (m AHD) across the Management Area. Depth to groundwater measurements collected during the current monitoring period and historical data are presented in **Table T1** (in **Appendix B**) and the inferred potentiometric contours are presented on **Figure 4** (October 2020), **Figure F5** (April 2021), **Figure F6** (August 2021), **Figure F7** (February – April 2022), **Figure F8** (August – October 2022) and **Figure F9** (April 2023) (**Appendix A**).

Most of the wells showed a decrease in groundwater elevation between the post wet and post dry season sampling events in shallow monitoring wells, screened in the Quaternary alluvium aquifer. Conversely, the groundwater elevation generally increased between the post dry season sampling events and the post wet season sampling event.

The majority of wells in the post-wet season event conducted in March 2023 recorded new historical maximums of groundwater elevation above historical ranges. The new maximum groundwater elevations in March 2023 may be associated with the generally above average rainfall through the 2022 dry season and early 2022/2023 wet season. Groundwater elevation response in line with seasonal rainfall is evident in the shallow monitoring wells.

Inferred groundwater flow directions in the shallow aquifer during the monitoring period were consistent with the flow presented in previous investigations (RPS and Wood, 2019b and 2019c), with groundwater from the base flowing north and northeast towards the Ross River floodplain.

8.2 Groundwater Results

Groundwater results for PFAS compared to assessment criteria are presented in **Table T2** in **Appendix B**.

PFAS concentrations were generally consistent with previous (historical) results undertaken since the DSI (RPS and Wood, 2019b).

The highest PFAS concentrations in the monitoring period were detected adjacent to the source areas of the Former Fire Station, and the Monocell/former fire training area both representing previously identified source areas. The maximum concentrations of PFOS+PFHxS during the monitoring period were as follows:

- Former Fire Station: 1,300 µg/L at MW128
- Monocell / Former Fire Training Area: 315 µg/L at MW072.

PFOS, PFOA or PFHxS concentrations were detected in monitoring wells down-hydraulic gradient from the identified PFAS source areas listed above and suggest that the groundwater impacts are associated with these areas.

Within the monitoring period PFAS concentrations did not exceed previous maximum concentrations except for the monitoring wells summarised in **Table 17**.

Table 17 Monitoring well locations with concentrations exceeding historical range in March 2023

Location	On-base (source area/area of interest)	Off-base
A and West Sub-catchment	<ul style="list-style-type: none"> MW125I (Base boundary) 	None
G and Central Sub-catchment	<ul style="list-style-type: none"> MW121 (Sporting fields) MW123I (Lavarack golf course) MW131 (Former Fire Training Area) MW138 (Middle Dam) 	<ul style="list-style-type: none"> MW233
J/K and East Sub-catchment	<ul style="list-style-type: none"> MW114 (Eastern PFAS Contamination Area) MW106 (Monocell) MW002 (base boundary), MW119 (Base boundary) 	<ul style="list-style-type: none"> None

New historical maximum concentrations were reported during the post wet-season sampling in 2022 and 2023. New maximum concentrations exceeded historical concentrations by less than or within the same order of magnitude, except at MW123I (base boundary adjacent to the Lavarack Barracks golf course) and MW131 (Former Fire Training Area). The mass flux study (WSP Golder, 2023) identified MW123S (next to MW123I) as being down-hydraulic gradient of the Former Fire Station and within the catchment (Catchment G) contributing the majority (approximately 75%) of off-base PFAS mass discharged at the base boundary. This well was also identified as having a higher degree of hydraulic conductivity when compared to other boundary wells. Similarly, MW002 in Catchment K exhibited high hydraulic conductivity and was identified as contributing the second highest annual groundwater PFOS+PFHxS mass flux after MW123S.

MW123I concentrations are within the same order of magnitude as adjacent boundary well MW123S and potentially attributed to generally above average rainfall in the preceding 12 months with similar groundwater elevations (within 0.2 m). Historically, the elevation difference between MW123I and MW123S has been an average of 0.6 m. The closure of the golf course, where these wells are located may also influence groundwater elevations due to reduced irrigation and mowing of this area potentially resulting in changes to the surface water runoff and infiltration in the area.

MW131 is of the same order of magnitude as MW072 and MW074 in the adjacent source area. New maximum concentrations were recorded at MW131 in October 2022 and further increased in the following event in March 2023 coinciding with above average monthly rainfall prior to both events.

PFOS was detected for the first time at off-base well MW235S in November 2020 and PFOS+PFHxS concentrations reported a new exceedance of adopted drinking water guidelines values in August 2021. Other PFAS compounds have previously been detected at this location and at two nearby monitoring wells (MW205S and MW236S). At downgradient locations, MW236S, PFOS+PFHxS remain at concentrations above the adopted drinking water guideline values, which is consistent with historical results.

The sampling was completed during a period where the rainfall fluctuated compared to the long-term average. The relative stability within each of the sub-catchment areas suggests the PFAS plume extent, particularly the lateral extent has not changed compared to the historical results.

8.3 Surface Water

Surface water results for PFAS compared to assessment criteria are presented in **Table T4** in **Appendix B** and graphically on **Graph 19 to 34 (Appendix C)** for PFOS+PFHxS and PFOA.

PFAS concentrations were generally consistent with previous (historical) results undertaken since the DSI (RPS and Wood, 2019b), except for those summarised in **Table 17**. The highest PFAS concentrations were detected adjacent to the Former Fire Station, a previously identified source area. The maximum concentration of PFOS+PFHxS was recorded in March 2022, post wet season, at SW109 (192 µg/L).

Table 18 Surface water locations with concentrations above historical range in March 2023

Location	On-base (source area/area of interest)	Off-base
A and West Sub-catchment	None	<ul style="list-style-type: none"> SW217
G and Central Sub-catchment	<ul style="list-style-type: none"> SW109, SW110 (Former Fire Station) SW144 (Top Dam) SW129 and SW130 (Lavarack golf course and sporting fields) SW139 (Middle Dam) SW128, SW132, SW133 (Base Boundary) 	<ul style="list-style-type: none"> SW203 SW205 SW211 SW233
J/K and East Sub-catchment	<ul style="list-style-type: none"> SW119, SW121 (Eastern PFAS Contamination Area) SW113, SW120 (on-base drainage line) SW135 (Base boundary) 	<ul style="list-style-type: none"> SW220 SW232 SW242
Ross River	N/A	<ul style="list-style-type: none"> None

Generally, PFAS compounds are lower in off-base monitoring locations compared to on-base monitoring locations.

SW113 reported a new exceedance of adopted ecological guideline for PFOS in October 2020, returning concentrations below this guideline in the following events. SW242 and SW128 reported new exceedances of the adopted ecological guideline value for PFOS in March 2023. Potentially the new maximum PFOS concentrations in March 2023 are associated with the generally above historic average rainfall resulting in increased concentrations in surface water runoff from potential PFAS source areas on-base.

There were also new exceedances of the adopted recreational guideline value for PFOS+PFHxS at SW119, SW121, SW132, SW135, SW139 and SW220 which were isolated with subsequent events detecting concentrations below this guideline.

New maximum PFOS+PFHxS concentrations at locations SW203 (1.8 µg/L) and SW233 (1.93 µg/L) with the G and Central sub-catchment are marginally below the adopted recreational guideline value of 2.0 µg/L. Both locations have historically exceeded the adopted ecological guideline values.

These new maximum concentrations and exceedances correlate with the findings of the mass flux study summarised in Section 6.1 which identified surface water in catchment G and to a lesser extent catchment K as the dominant mass discharge mechanisms for PFAS migrating off-base.

8.4 Sediment

Sediment results are presented in **Table T5 (Appendix B)**. PFAS concentrations were generally consistent with previous (historical) results undertaken since the DSI (RPS and Wood, 2019b), except for new maximums concentrations summarised in **Table 19**.

Table 19 Sediment locations with concentrations above historical range

Location	On-base (source area/area of interest)	Off-base
A and West Sub-catchment	<ul style="list-style-type: none"> SD126 (Base Boundary) 	<ul style="list-style-type: none"> None
G and Central Sub-catchment	<ul style="list-style-type: none"> SD109, SD110 (Former Fire Station) SD129 (Lavarack Golf Course & Sporting Field) SD128, SD133 (Base Boundary) SD139 (Middle Dam) SD144 (Top Dam) 	<ul style="list-style-type: none"> SD242

Location	On-base (source area/area of interest)	Off-base
J/K and East Sub-catchment	<ul style="list-style-type: none"> SD120, SD121 (Eastern PFAS Contamination Area) 	<ul style="list-style-type: none"> SD232
Ross River	N/A	<ul style="list-style-type: none"> None

First-time detections were reported during the current monitoring period as a result of first-time sampling of sediment at these locations. All locations which were sampled for the first time were within the existing catchment boundaries considered in the DSI (RPS and Wood, 2019b).

Generally, PFAS compounds are lower in off-base monitoring locations compared to on-base monitoring locations.

Some locations in the monitoring period with historical data available had new historical maximum concentrations, although data variability is expected at the low concentrations detected. The highest PFAS concentrations in sediment samples were at SD109 and SD110 located adjacent to the Former Fire Station source area.

Based on the concentrations of PFAS in sediment there is no significant change to the risk to human health and the environment. The frequency and locations of sampling remains sufficient.

9.0 Conceptual Site Model

The CSM was developed during the previous investigation stages (RPS and Wood, 2019a and 2020a) and summarised in the OMP as part of the PMAP (Defence, 2020). The CSM summarises the linkages between PFAS sources, exposure pathways and receptors.

The sampling completed over the monitoring period (October 2020 to April 2023) has provided additional data to further understand the nature and extent of PFAS concentrations in groundwater, surface water and sediment. Comparison to the available historical dataset indicates that PFAS concentrations in groundwater and surface water are relatively stable since the CSM was developed, as part of the DSI, (RPS and Wood, 2019b) and the plume extent has not changed.

Key observations in relation to the CSM include:

- PFAS concentrations were generally within historical ranges.
- Despite new maximums and first-time detects, the inferred PFAS transport mechanisms (of overland flow, leaching to groundwater and groundwater/surface water interaction) and the groundwater, surface water and sediment concentrations are generally similar to those reported in (RPS and Wood, 2019a), (RPS and Wood, 2019b) and (RPS and Wood, 2020a). Some localised increases were noted which are inconsistent with the CSM, at MW131 (located in a source area) and MW123I (located on the base boundary) which reported new maximum concentrations. Off-base well MW235S reported a new exceedance of adopted drinking water guidelines for PFOS+PFHxS that was isolated to a single event in August 2021. Subsequent results were below this guideline. Groundwater is not extracted or used on-base so there is no new exposure pathway at MW131. MW123I and MW235S are within the plume extent previously considered for the CSM and the downgradient off-base well MW236S has consistently reported exceedances of the drinking water guidelines. No new exposure pathways for groundwater were identified.
- On-base surface water location at SW119, SW121, SW132, SW135 and SW139 had new exceedances of the adopted recreational guideline value for PFOS+PFHxS which were isolated with subsequent events detecting concentrations below this guideline. Other on-base surface water locations have historically exceeded the adopted recreational guideline value and were considered in the previous CSM.
- Off-base surface water location SW220 (at Gordon Creek) in Catchment J/K reported an isolated new exceedance of adopted recreational guidelines value for PFOS+PFHxS in August 2022 and concentrations were reported below the adopted guideline, in the subsequent event in March 2023. SW220 has consistently reported concentrations above the adopted ecological guideline values since 2017. Concentrations in further downstream location SW242 (Idalia Lake) and SW232 continue to fluctuate below the adopted recreational guideline value. SW242 exceeded the adopted ecological guideline value for the first-time in March 2023 however the downgradient sample SW232 was reported below the ecological guideline. Human health and ecological receptors in the Ross River and associated tributaries were identified in the CSM and the exposure pathways associated with these receptors remain the same and precautionary advice (and the associated signage) for consumption of fish from Idalia Lakes remains in place.
- Off-base surface water locations SW203 and SW233 have historically exceeded the adopted ecological guideline values and concentrations in the most recent monitoring round are approaching the adopted recreational guideline value. However, concentrations at downstream location SW205 have remained stable. Therefore, the exposure pathways previously considered in the CSM remain unchanged and no new exposure pathways have been identified.
- Newly sampled sediment locations are within sub-catchments on-base and off-base with sediment data already considered in the HHRA (RPS and Wood, 2019a) and ERA (RPS and Wood, 2020a) and the exposure pathways and transport mechanisms associated with sediment have not changed.

The pathways for PFAS exposure and risks to human health and ecological receptors presented in the HHRA (RPS and Wood, 2019a) and the ERA (RPS and Wood, 2020a) are considered to remain relevant and data presented in this report does not suggest any significant changes to these mechanisms.

The data presented in this report do not change the understanding of the CSM. Future monitoring will continue to contribute to an evaluation of any potential changes to the CSM understanding.

10.0 Discussion

10.1 Risk Profile

The risk profile to human health and ecological receptors within the Management Area is unchanged, based on the data assessment which identified that:

- The overall PFAS plume extent of groundwater has not changed compared to historical results.
- Groundwater PFAS concentrations are relatively stable, except for MW123I and MW131 with new maximum concentrations although nearby wells within the same area have concentrations of the same order of magnitude off-base well MW235S recorded an isolated spike in August 2021, but subsequent events are with the same order of magnitude as historical results. Off-base groundwater well MW236S has consistently reported concentrations exceeding the drinking water guideline. The risk assessment previously identified that off-Base groundwater was not used for drinking and was limited to non-potable uses. Recreational use of sporting fields irrigated with groundwater was considered in the risk assessment and as the exposure pathways and transport mechanisms and receptors have not changed, the risk profile remains the same.
- PFAS concentrations in surface water bodies were generally consistent with historical results with some locations off-base (specifically at SW220, in Gordon Creek) and on-base which had isolated new exceedances of adopted recreational guideline for PFOS+PFHxS concentrations. Off-base surface water locations have historically not exceeded the adopted recreational guideline value and on this basis the HHRA considered the exposure pathway for off-base human health receptors to be low and acceptable (RPS and Wood, 2020a). Due to the condition of Gordon Creek (i.e., a swampy area and located next to the main road), it is not considered suitable for recreational purposes such as swimming and fishing. The area is part of the Townsville Connection Road works. An observation during sampling in March 2023 showed early works has commenced. As these exceedances were not sustained over the monitoring period and pathways to recreational receptors are unlikely to be complete for Gordon Creek, the CSM and risk profile are unchanged and further monitoring is required to assess the completeness of the exposure pathway, particularly for off-base recreational receptors. Sediment concentrations have remained stable and consistent with historical results of the respective sub-catchment area either on-base or off-base with SD109 (on-base adjacent to the former fire station) consistently exhibiting the highest concentrations. The risk profile to on-base receptors has not changed.
- Precautionary advice issued by the Queensland Government for the consumption of fish caught from Idalia Lakes remains in place.

Based on a review of the OMP data, AECOM considers that the conclusions made in the HHRA (RPS and Wood, 2019a) and ERA (RPS and Wood, 2020a) still apply and there are no changes to the risk profile.

10.2 Assessment of current OMP

Based on the above review of the data collected during the monitoring period, there are no changes to the understanding of the nature, extent or risks associated with PFAS within the Management Area. The need for monitoring of additional media was not identified as required at this time. Based on this, there are currently no triggers for review of the OMP.

11.0 Conclusions

Groundwater, surface water and sediment monitoring were completed for the OMP between October 2020 and March 2023 in general accordance with the SAQP (AECOM, 2023b). Data from the DSI (RPS and Wood, 2019b) and Seasonal Monitoring Reports completed in 2019 and 2020 (RPS and Wood, 2019c and 2020b) were included in this report to assess changes from historical conditions.

The data collected has met the objectives of the OMP (Defence, 2020) and SAQP (AECOM, 2023b).

Groundwater PFAS concentrations are relatively stable and overall, the data indicate that the nature and extent of PFAS in groundwater off-base has not changed from the understanding presented in the investigation phases and the PMAP (Defence, 2020).

PFAS concentrations in surface water bodies were generally consistent with historical results with some locations off-base and on-base which had isolated new exceedances of adopted recreational guideline for PFOS+PFHxS. Off-base surface water locations have historically not exceeded this guideline, although given the exceedance was isolated and not sustained over the monitoring period, the risk profile is considered unchanged. Continued monitoring is required to assess if this exposure pathway is complete and to confirm if the reported exceedances are sustained over both wet and dry seasonal conditions. The on-base risk profile is unchanged. Whilst some fluctuation in PFAS concentrations in sediment was reported during the monitoring period the distribution of PFAS in sediments has not changed and the concentrations do not present a change to the risk profile.

The CSM was reviewed, and no changes were identified to the sources, pathways or receptors at the base and within the Management Area.

Based on the data reviewed, there were no changes to the risk profile, and there are no triggers to review the ongoing monitoring program. Based on the data, AECOM considers that the conclusions made in the HHRA (RPS and Wood, 2019a) and ERA (RPS and Wood, 2020a) still apply.

12.0 References

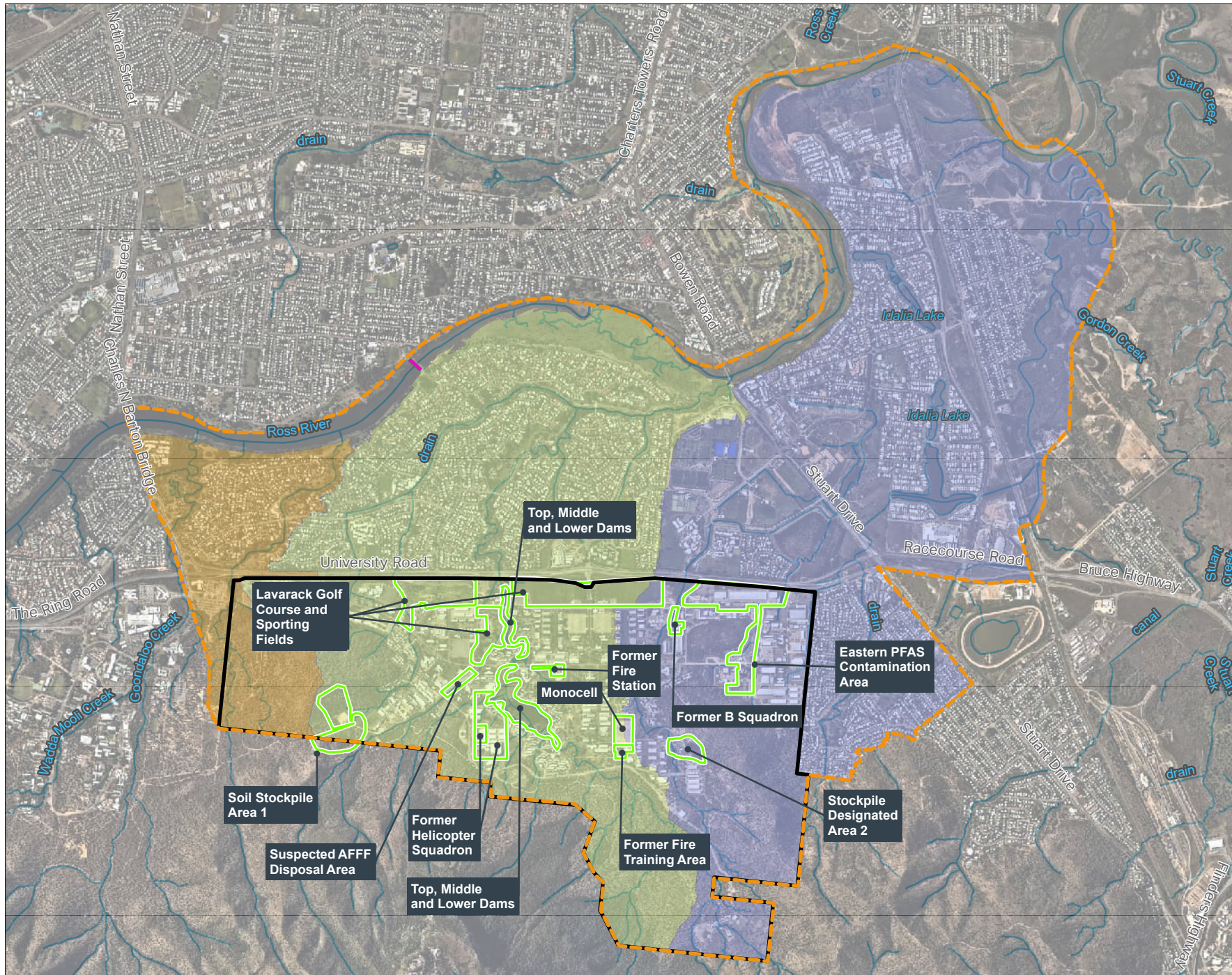
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Appendix A

Figures

Legend

- Base Boundary
- Management Area
- Aplin's Weir
- Source Areas
- Sub-catchments**
 - A and West
 - G and Central
 - J/K and East
 - Watercourse



**FIGURE F1:
MANAGEMENT AREA**

PROJECT NAME:
PFAS OMP
REPORT NAME:
Ongoing Monitoring Interpretive
Report (October 2020 - March 2023) -
Lavarack Barracks
CLIENT NAME:
Department of Defence
PROJECT NUMBER:
60612487

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Legend

- Base Boundary
- Management Area
- Aplin's Weir
- Source Areas
- Sub-catchments**
- A and West
- G and Central
- J/K and East
- Watercourse
- On-Base Monitoring Well
- Off-Base Monitoring Well
- Tidally Influenced Groundwater Sample Location

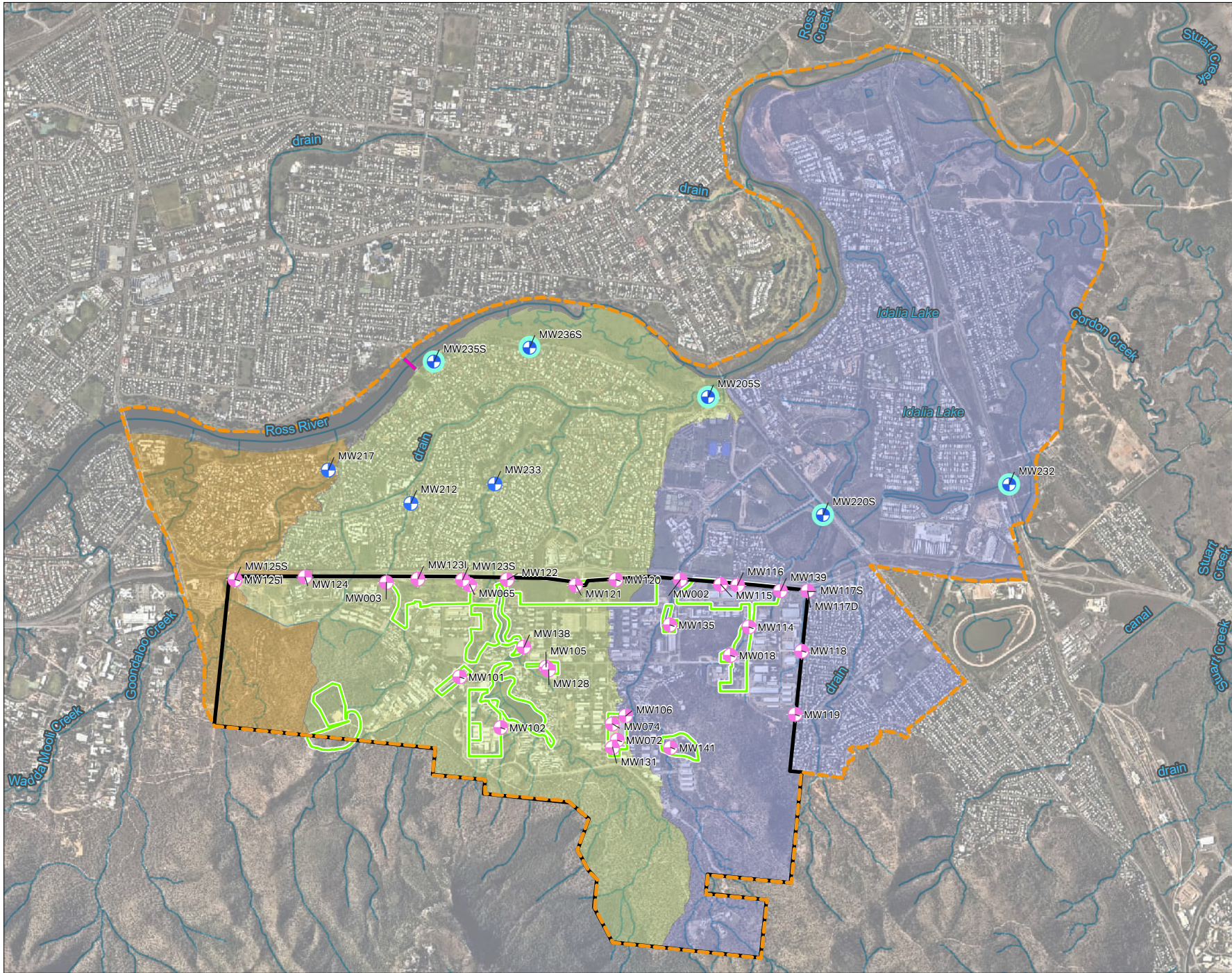
**FIGURE F2:
GROUNDWATER
SAMPLING LOCATIONS**

PROJECT NAME:
PFAS OMP
REPORT NAME:
Ongoing Monitoring Interpretive Report (October 2020 - March 2023) - Lavarack Barracks
CLIENT NAME:
Department of Defence
PROJECT NUMBER:
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Legend

- Base Boundary
- Management Area
- Aplin's Weir
- Source Areas
- Sub-catchments**
- A and West
- G and Central
- J/K and East
- Watercourse
- On-Base Co-located Surface Water and Sediment Sample Location
- Off-Base Co-located Surface Water and Sediment Sample Location

**FIGURE F3:
SURFACE WATER
AND SEDIMENT
SAMPLING LOCATIONS**

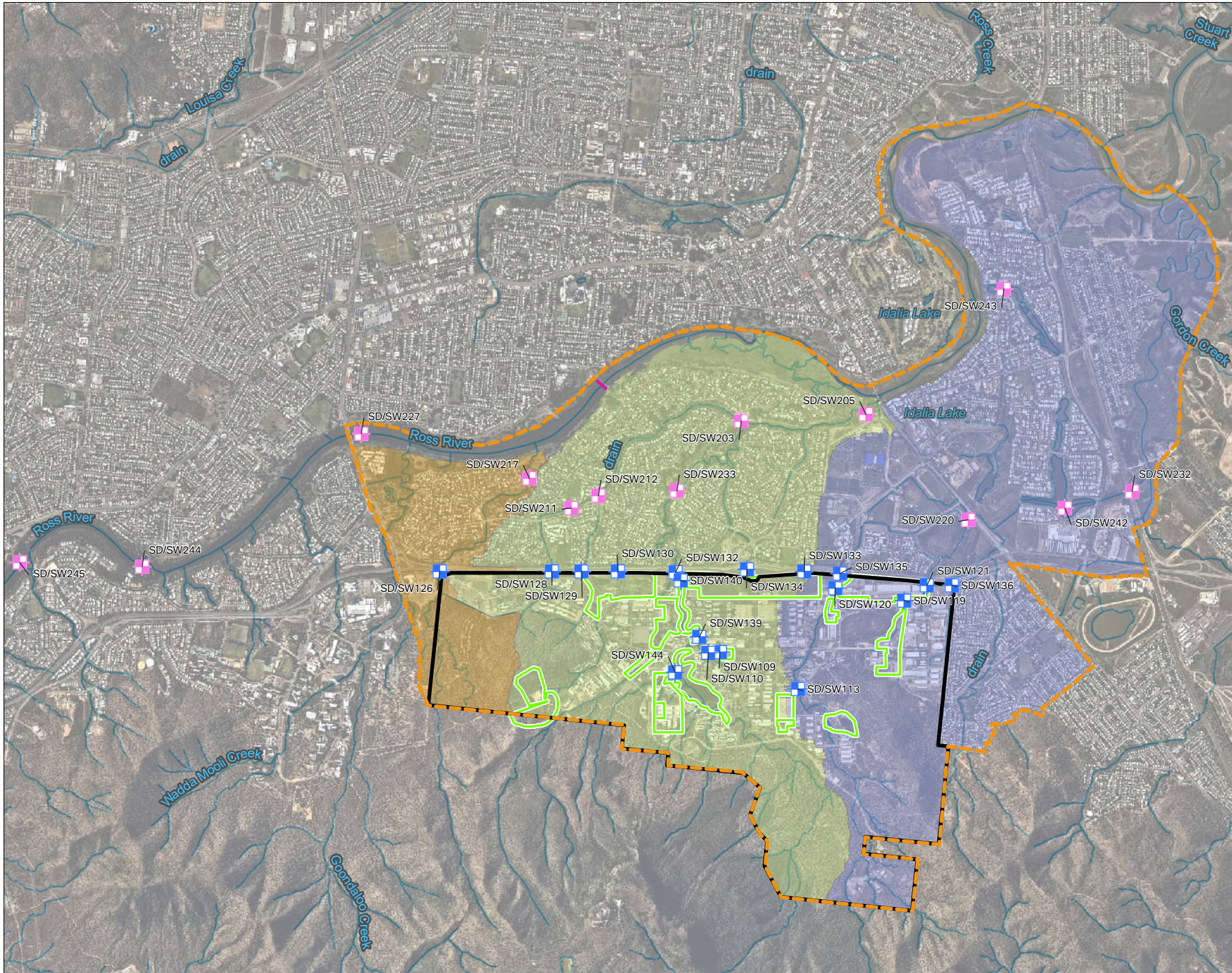
PROJECT NAME:
PFAS OMP
REPORT NAME:
Ongoing Monitoring Interpretive
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Legend

- Base boundary
- Sub-Management Area Boundary
- Aplin's Weir
- Source Areas
- Watercourses
- Groundwater Contour
- Inferred Groundwater Flow Direction
- Groundwater Monitoring Well

Note: All elevations are in m AHD

**FIGURE F4:
INFERRED
GROUNDWATER
CONTOURS- SHALLOW
AQUIFER (ALLUVIUM):
OCTOBER 2020**

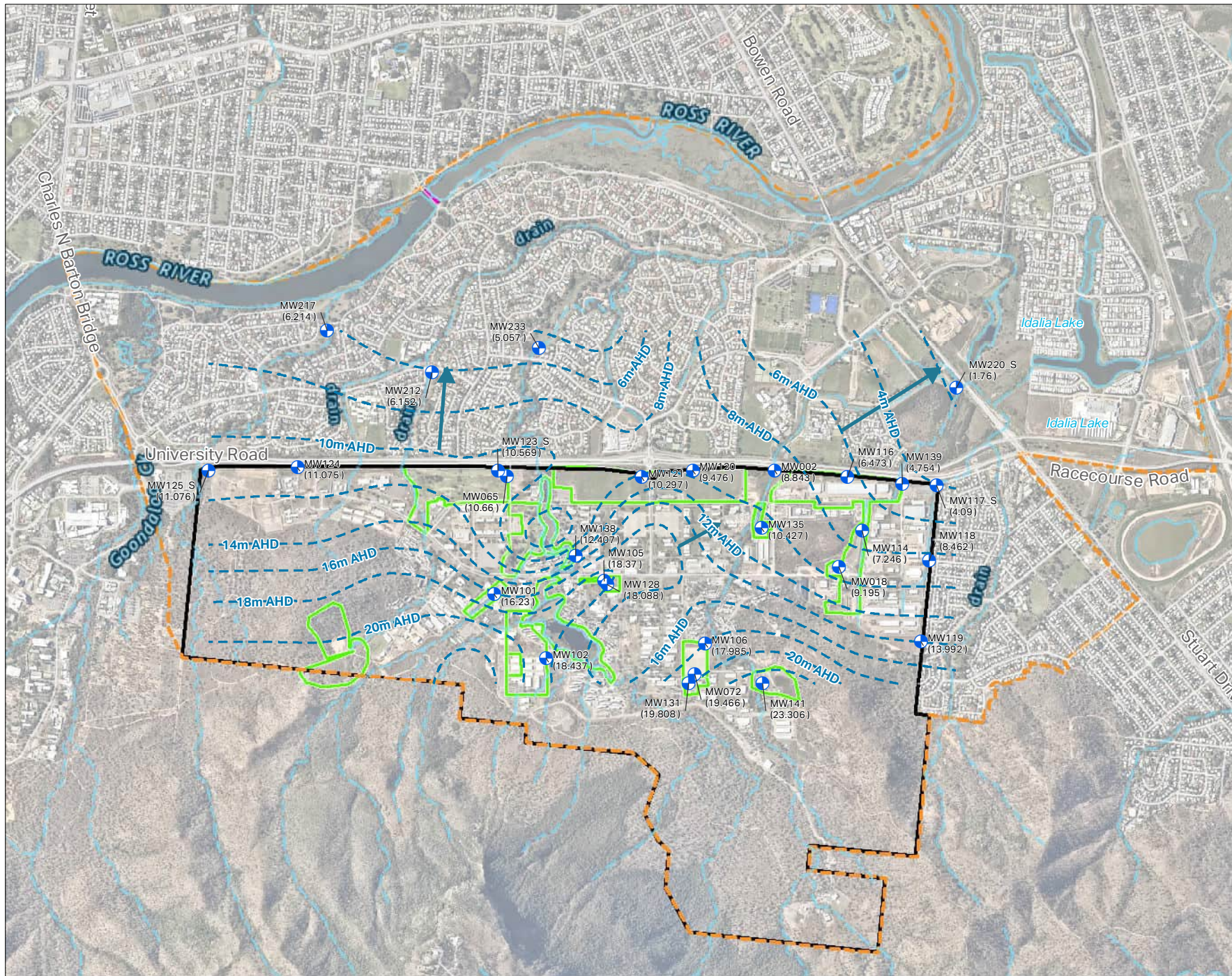
PROJECT NAME:
PFAS OMP
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Legend

- Base Boundary
- Management Area
- Aplin's Weir
- Source Areas
- Watercourses
- Groundwater Contour
- Inferred Groundwater Flow Direction
- Groundwater Monitoring Well

Note: All elevations are in m AHD

**FIGURE F5:
INFERRED
GROUNDWATER
CONTOURS- SHALLOW
AQUIFER (ALLUVIUM):
APRIL 2021**

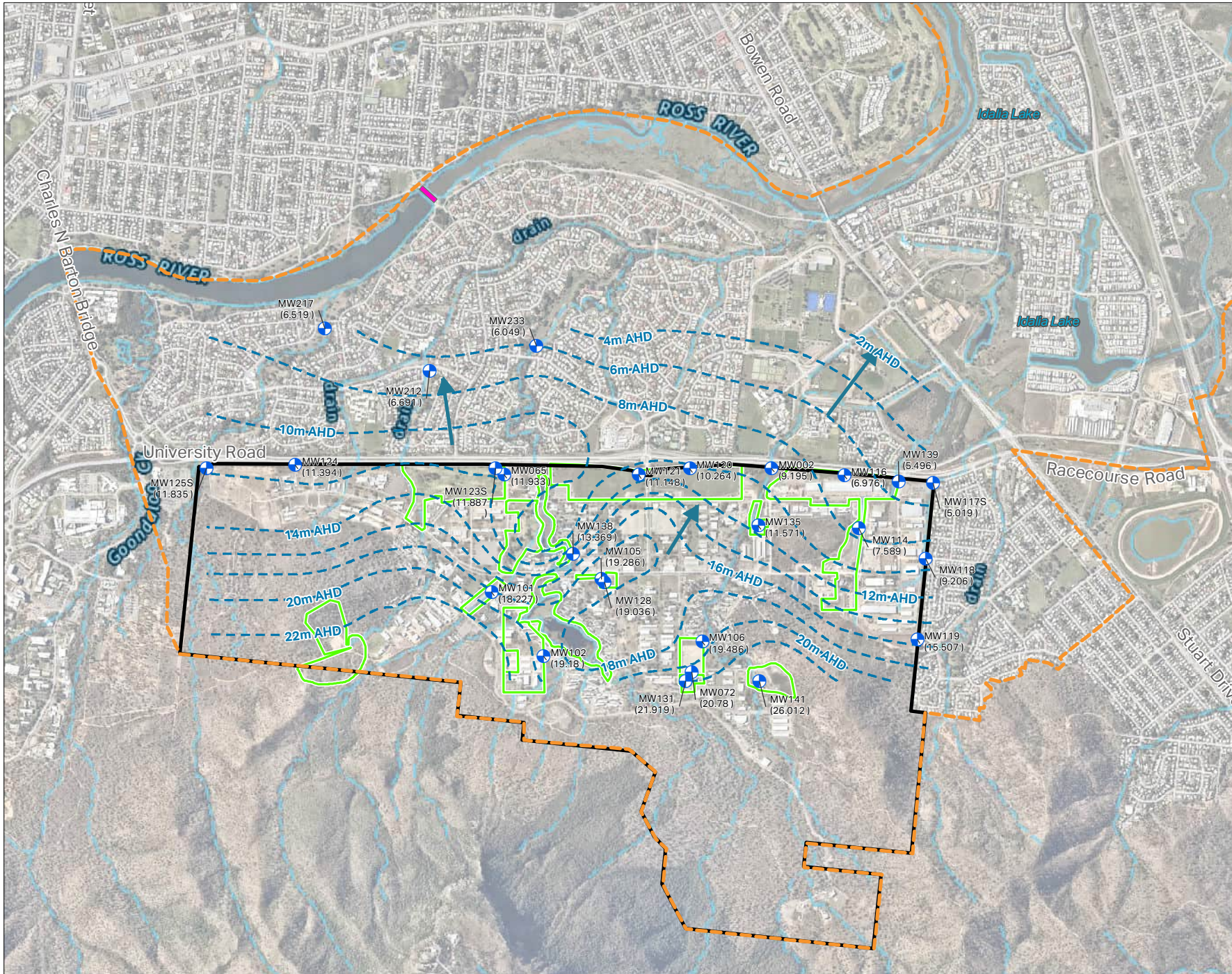
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Legend

- Base Boundary
- Management Area
- Aplin's Weir
- Source Areas
- Watercourses
- Groundwater Contour
- Inferred Groundwater Flow Direction
- Groundwater Monitoring Well

Note: All elevations are in m AHD

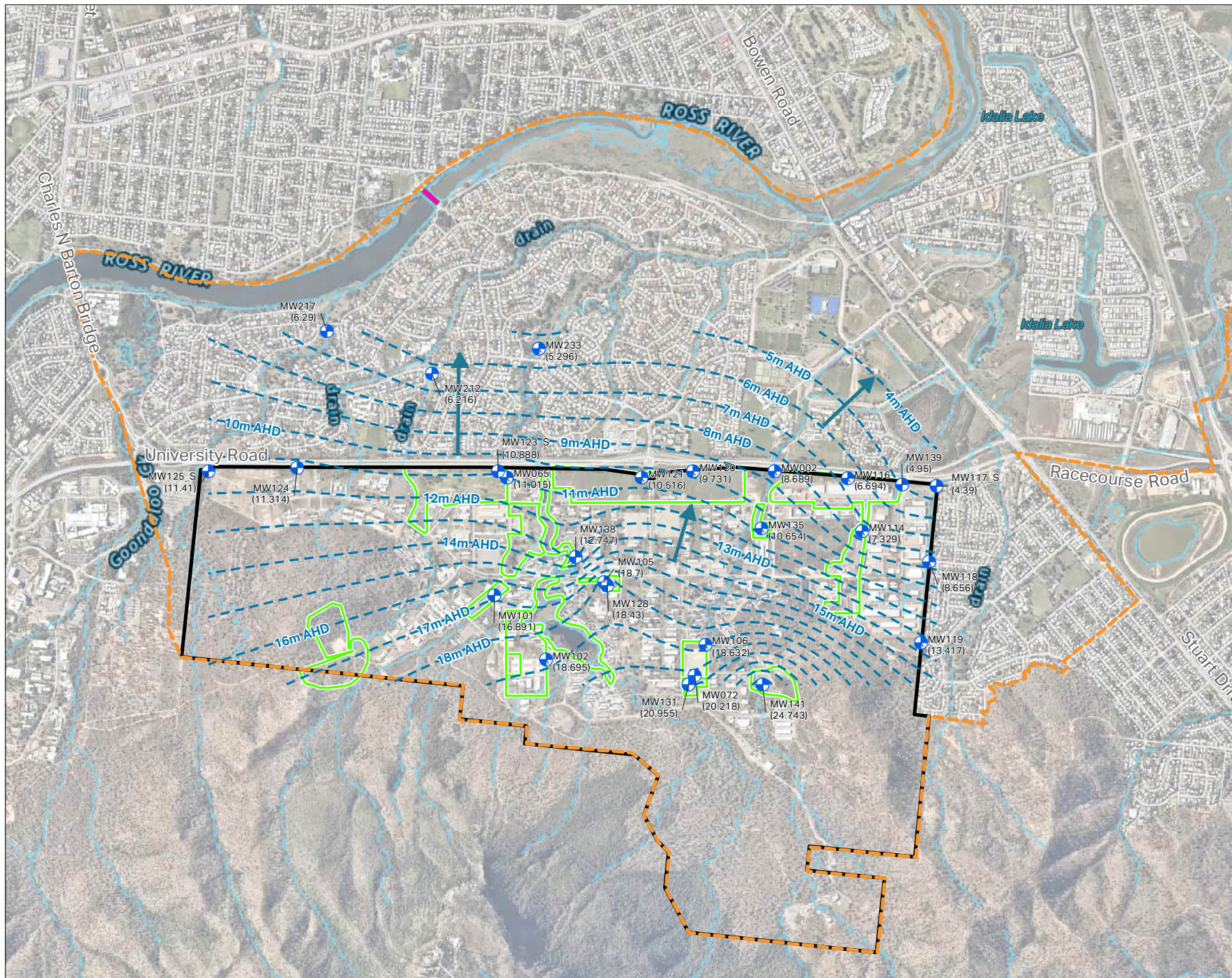


FIGURE F6:
INFERRED
GROUNDWATER
CONTOURS- SHALLOW
AQUIFER (ALLUVIUM):
AUGUST 2021

PROJECT NAME:
 PFAS OMP
REPORT NAME:
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CLIENT NAME:
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PROJECT NUMBER:
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Legend

- Base Boundary
- Management Area
- Aplin's Weir
- Source Areas
- Sub-catchments**
- A and West
- G and Central
- J/K and East
- Watercourse
- Groundwater Contour
- Inferred Groundwater Flow Direction
- On-Base Monitoring Well
- Off-Base Monitoring Well

FIGURE F7: INFERRED GROUNDWATER CONTOURS- SHALLOW AQUIFER (ALLUVIUM): FEBRUARY - APRIL 2022

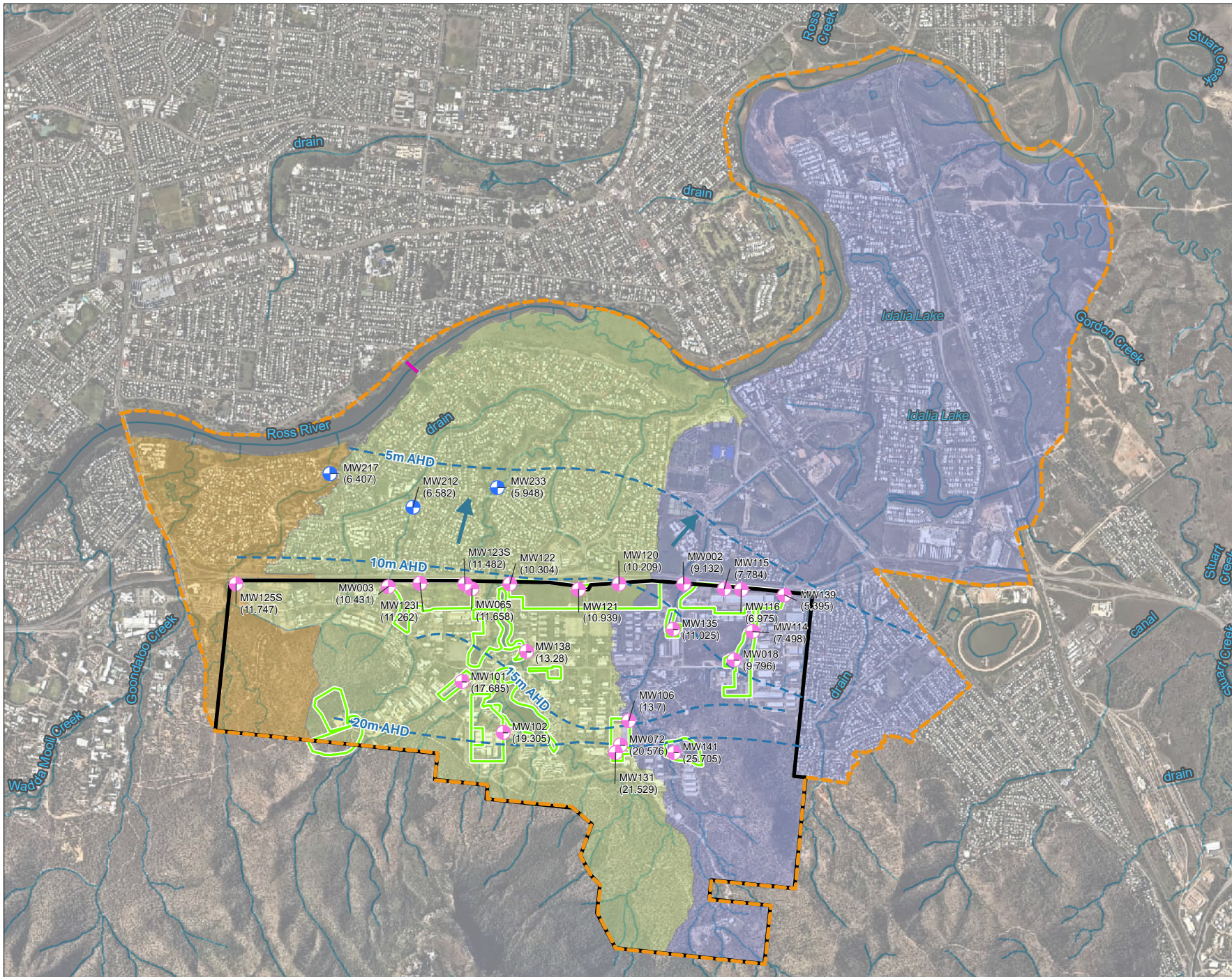
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PFAS OMP
REPORT NAME:
Ongoing Monitoring Interpretive Report (October 2020 - March 2023) - Lavarack Barracks
CLIENT NAME:
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Legend

- Base Boundary
- Management Area
- Aplin's Weir
- Source Areas
- Sub-catchments**
- A and West
- G and Central
- J/K and East
- Watercourse
- Inferred Groundwater Contour
- Groundwater Flow Direction
- On-Base Monitoring Well
- Off-Base Monitoring Well

FIGURE F8: INFERRED GROUNDWATER CONTOURS- SHALLOW AQUIFER (ALLUVIUM); AUGUST - OCTOBER 2022

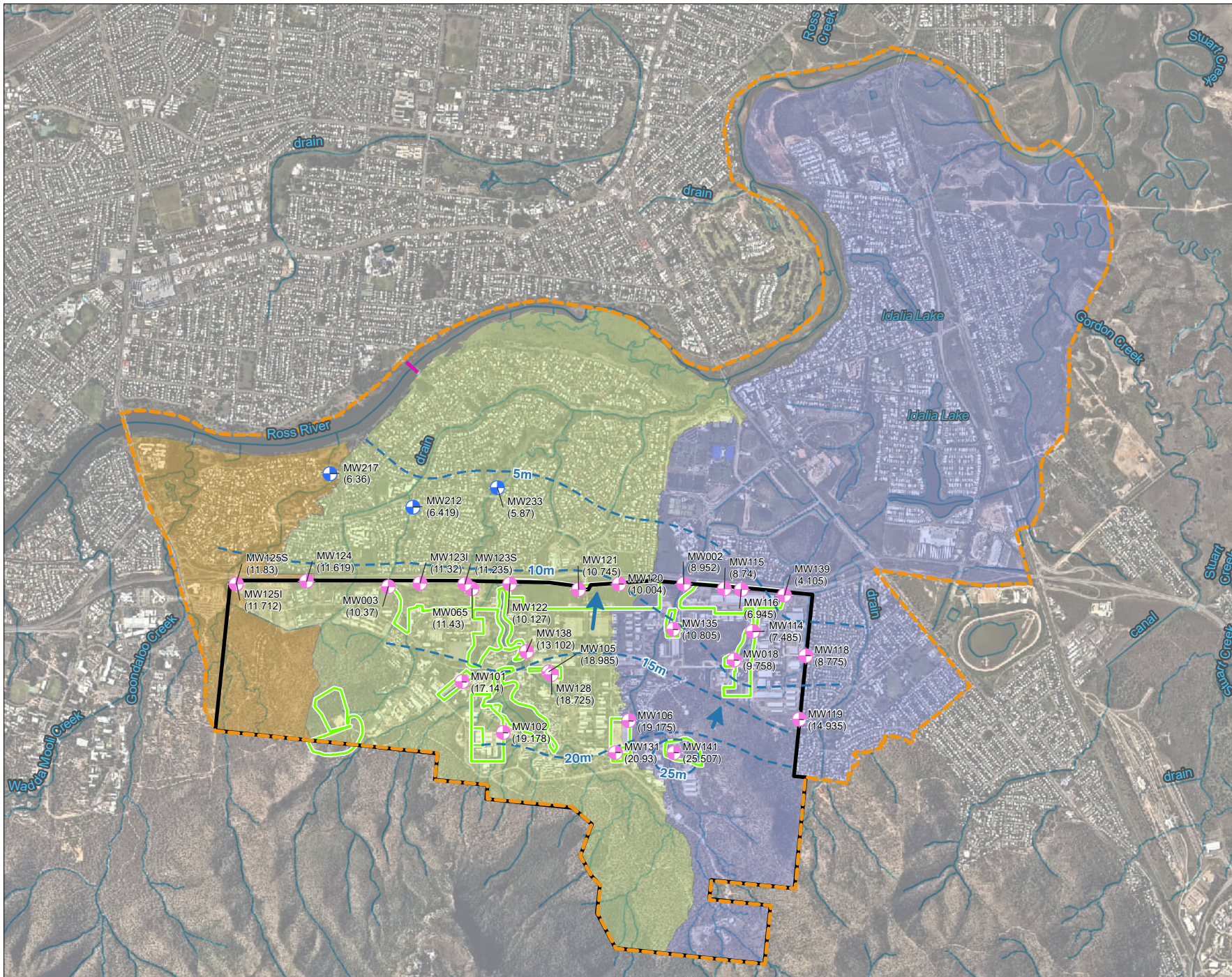
PROJECT NAME:
PFAS OMP
REPORT NAME:
Ongoing Monitoring Interpretive Report (October 2020 - March 2023) - Lavarack Barracks
CLIENT NAME:
Department of Defence
PROJECT NUMBER:
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Legend

- Base Boundary
- Management Area
- Aplin's Weir
- Source Areas
- Sub-catchments**
- A and West
- G and Central
- J/K and East
- Watercourse
- Inferred Groundwater Contour
- Groundwater Flow Direction
- On-Base Monitoring Well
- Off-Base Monitoring Well

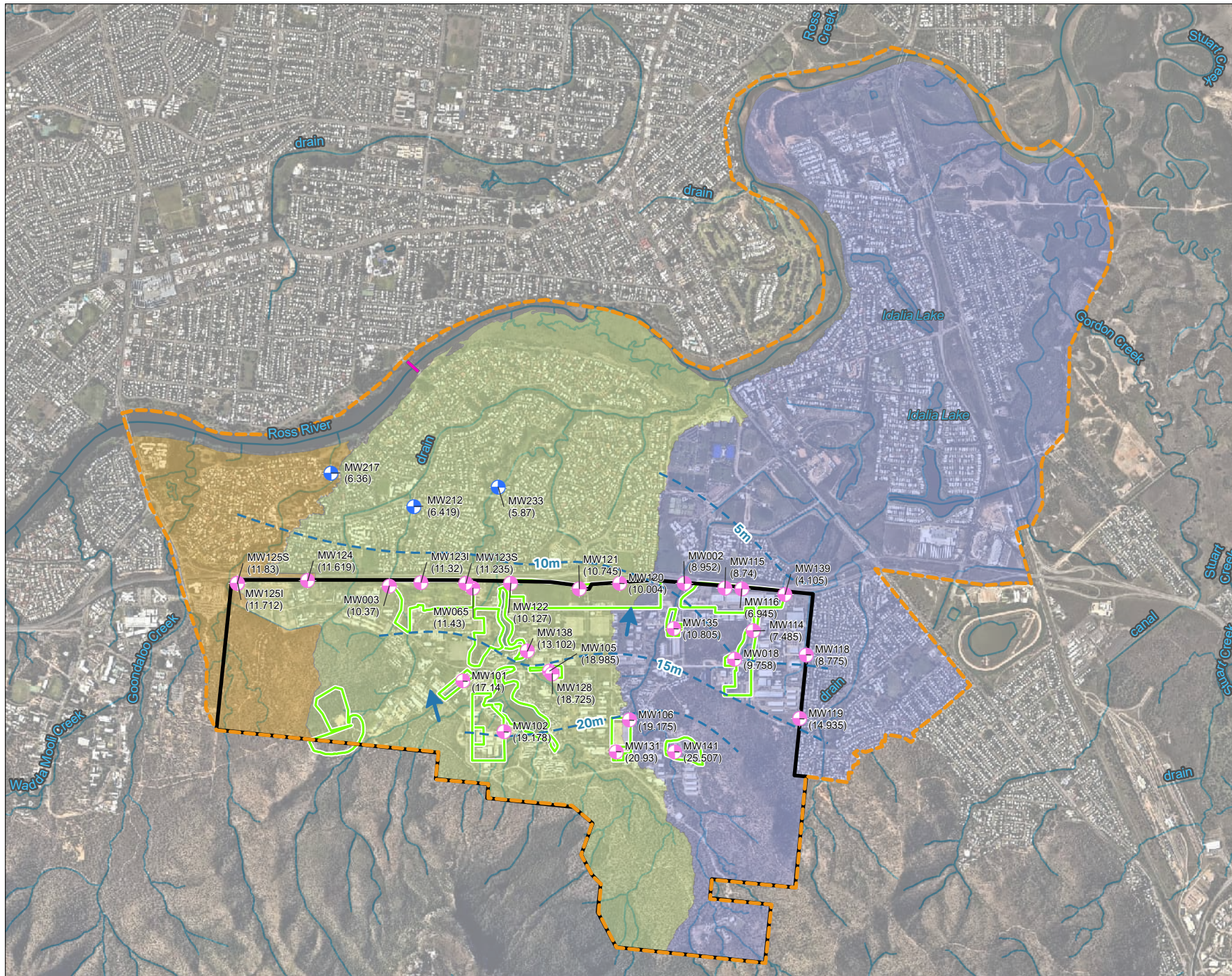
FIGURE F9: INFERRED GROUNDWATER CONTOURS- SHALLOW AQUIFER (ALLUVIUM): MARCH 2023

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REPORT NAME:
Ongoing Monitoring Interpretive Report (October 2020 - March 2023) - Lavarack Barracks
CLIENT NAME:
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PROJECT NUMBER:
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Legend

- Base Boundary
- Management Area
- Aplin's Weir
- Source Areas
- Sub-catchments**
 - A and West
 - G and Central
 - J/K and East

Concentrations of PFOS+PFHxS (µg/L)

- > 50
- > 10 - 50
- > 0.07 - 10
- > LOR - 0.07
- < LOR

**FIGURE F10:
GROUNDWATER
CONCENTRATIONS OF
PFOS+PFHXS –
OCTOBER 2020**

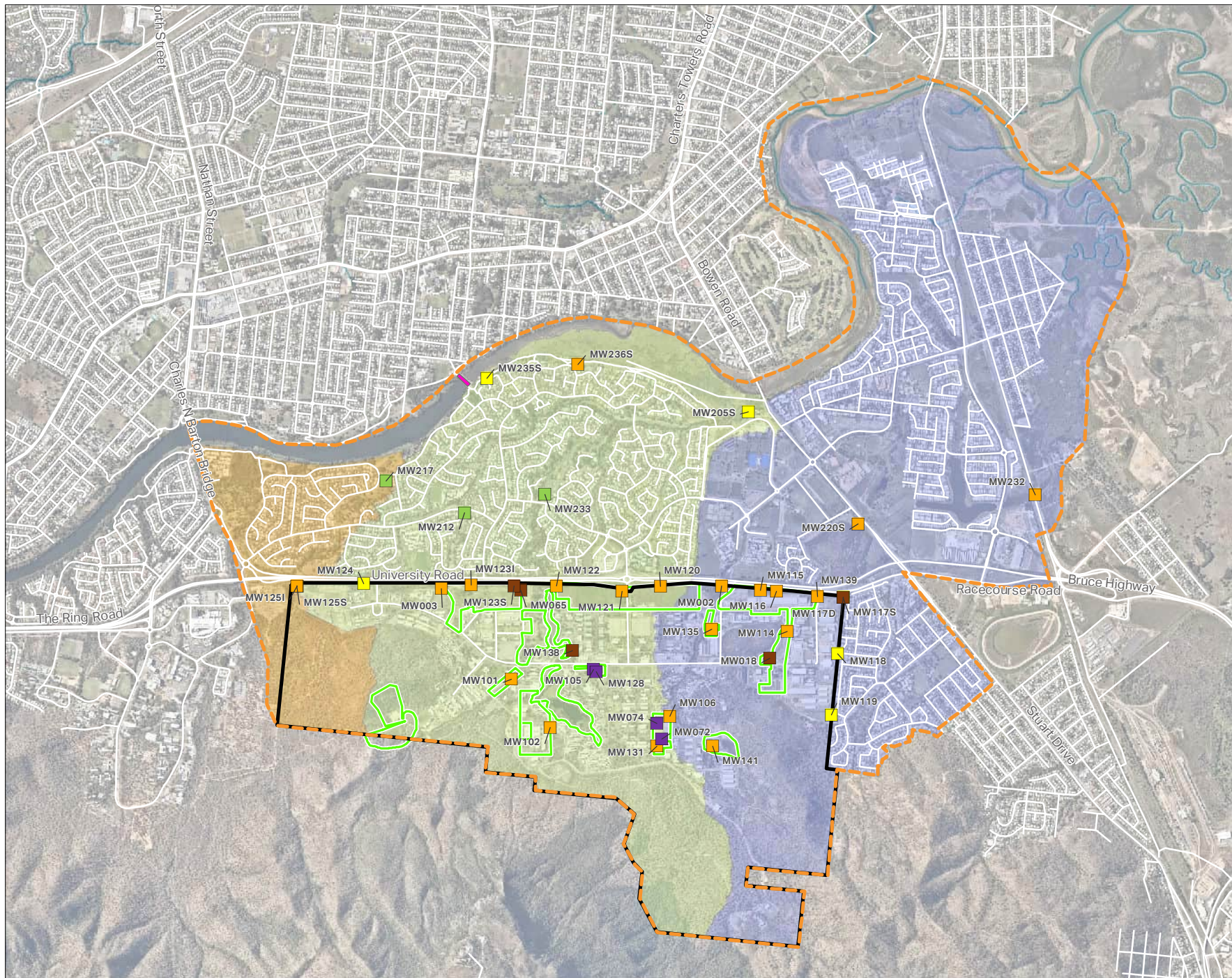
PROJECT NAME:
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REPORT NAME:
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Legend

- Base Boundary
- Management Area
- Aplin's Weir
- Source Areas
- Sub-catchments**
 - A and West
 - G and Central
 - J/K and East

PFOA (µg/L)

- > 50
- > 10 - 50
- > 0.56 - 10
- > LOR - 0.56
- < LOR

**FIGURE F11:
GROUNDWATER
CONCENTRATIONS OF
PFOA – OCTOBER
2020**

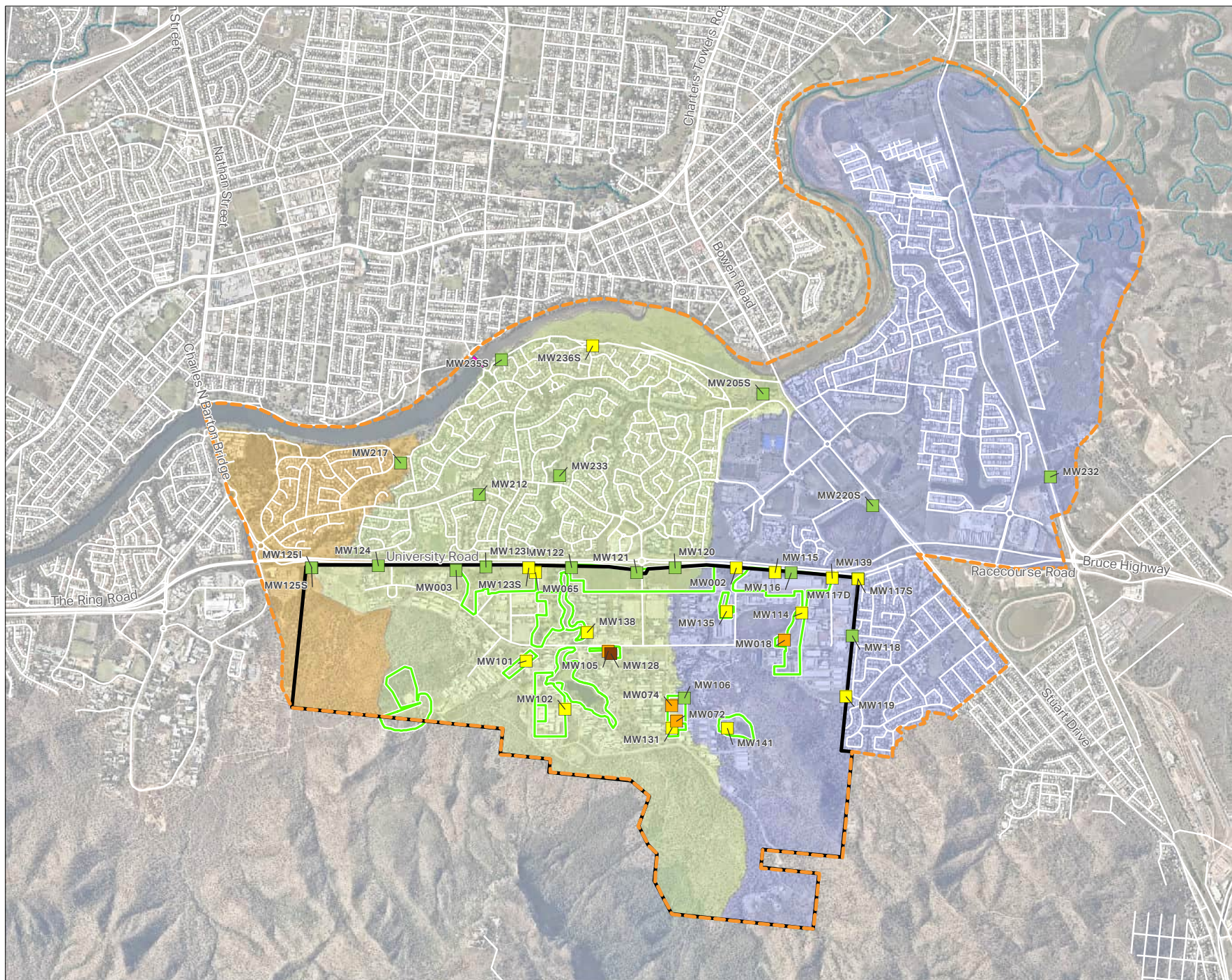
PROJECT NAME:
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REPORT NAME:
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Legend

- Base Boundary
- Management Area
- Aplin's Weir
- Source Areas
- Sub-catchments**
 - A and West
 - G and Central
 - J/K and East

Concentrations of PFOS + PFHxS (µg/L)

- > 50
- > 10 - 50
- > 0.07 - 10
- > LOR - 0.07
- <LOR

**FIGURE F12:
GROUNDWATER
CONCENTRATIONS OF
PFOS+PFHxS –
MARCH-APRIL 2021**

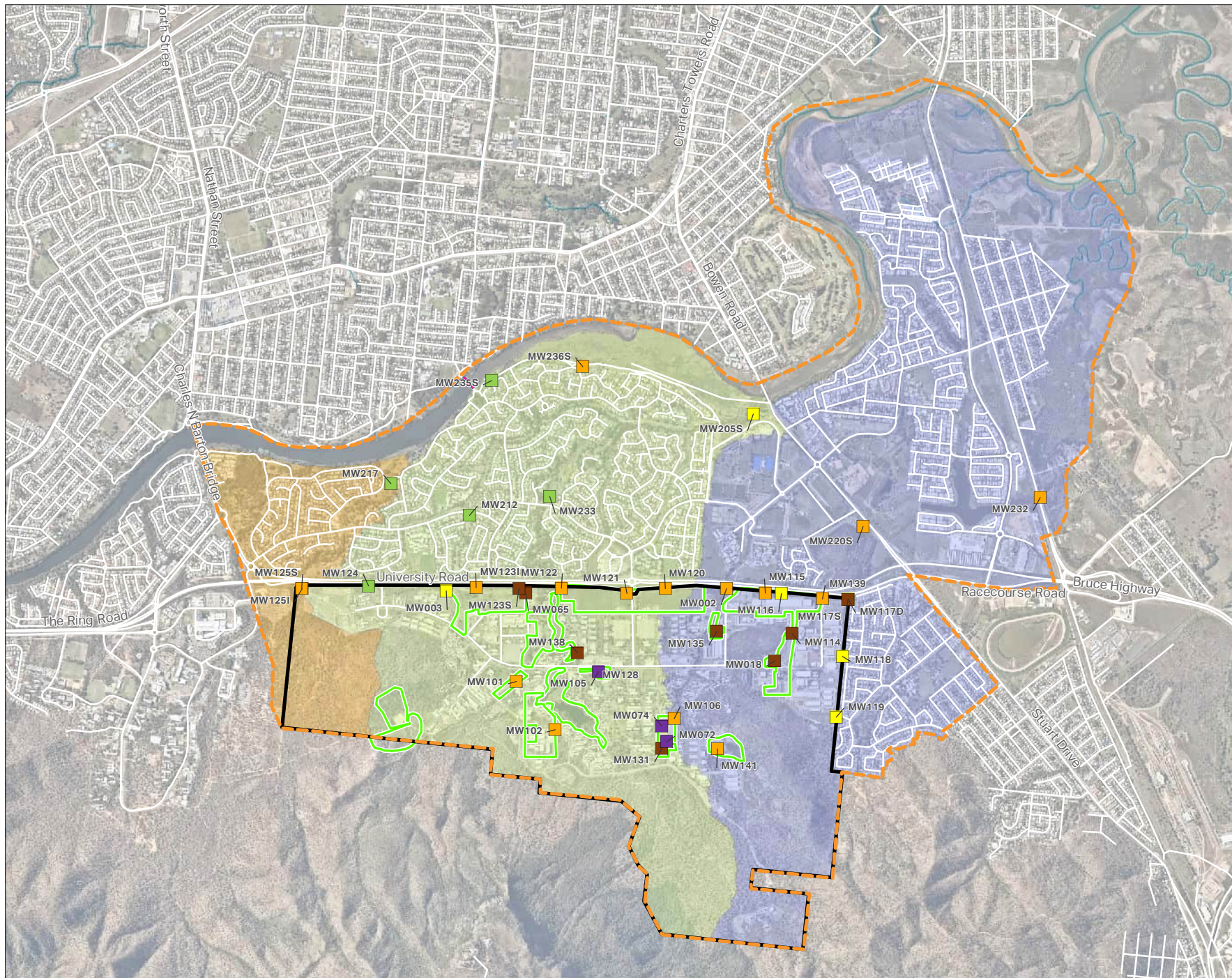
PROJECT NAME:
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Legend

- Base Boundary
- Management Area
- Aplin's Weir
- Source Areas

Sub-catchments

- A and West
- G and Central
- J/K and East

PFOA (µg/L)

- > 50
- > 10 - 50
- > 0.56 - 10
- > LOR - 0.56
- < LOR

**FIGURE F13:
GROUNDWATER
CONCENTRATIONS OF
PFOA – MARCH-APRIL
2021**

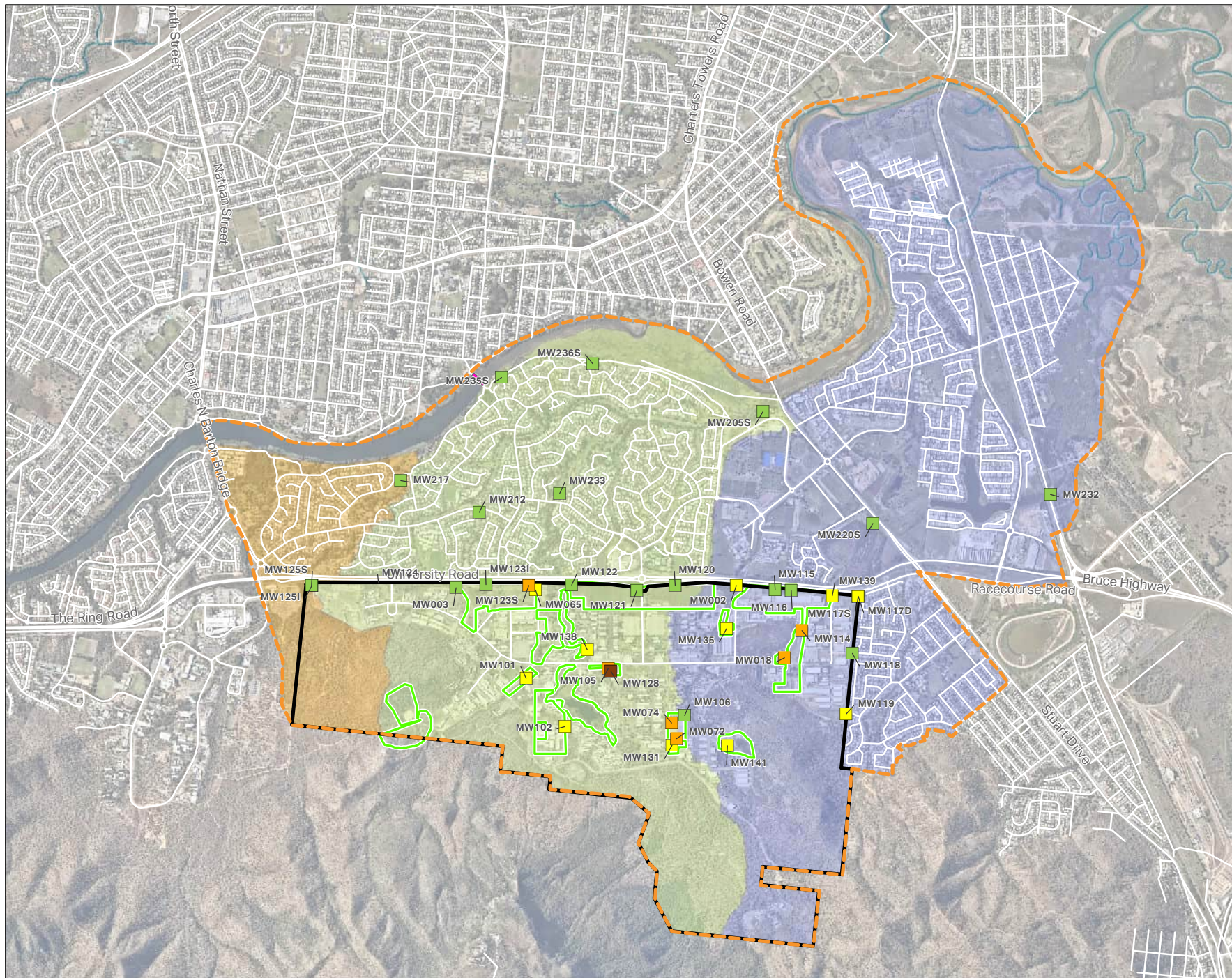
PROJECT NAME:
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Legend

- Base Boundary
- Management Area
- Aplin's Weir
- Source Areas
- Sub-catchments**
- A and West
- G and Central
- J/K and East

Concentrations of PFOS+PFHxS (µg/L)

- > 50
- > 10 - 50
- > 0.07 - 10
- > LOR - 0.07
- < LOR

**FIGURE F14:
GROUNDWATER
CONCENTRATIONS OF
PFOS+PFHxS –
AUGUST 2021**

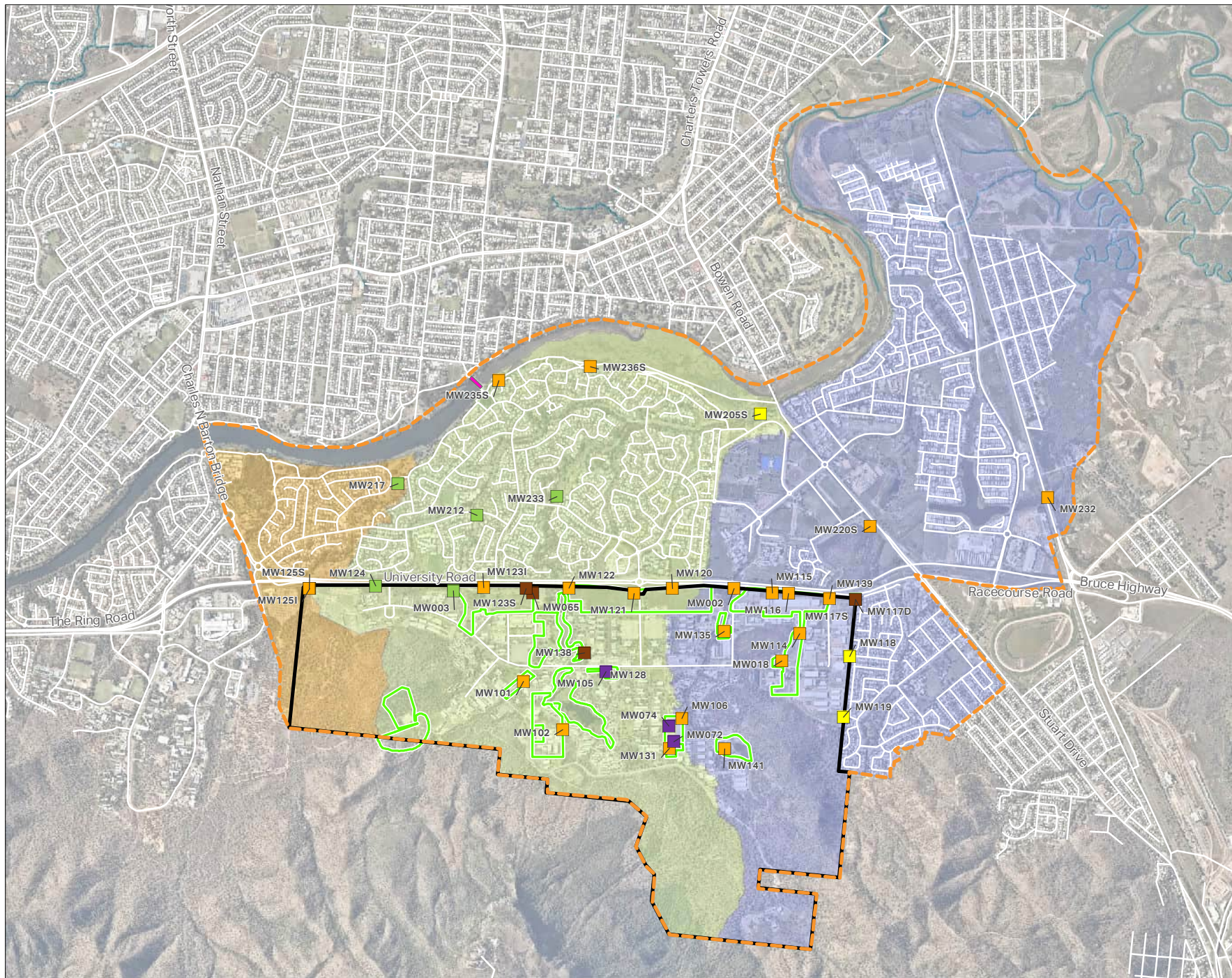
PROJECT NAME:
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REPORT NAME:
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Legend

- Base Boundary
- Management Area
- Aplin's Weir
- Source Areas
- Sub-catchments**
- A and West
- G and Central
- J/K and East

PFOA (µg/L)

- > 50
- > 10 - 50
- > 0.56 - 10
- < LOR - 0.56
- < LOR

**FIGURE F15:
GROUNDWATER
CONCENTRATIONS OF
PFOA – AUGUST 2021**

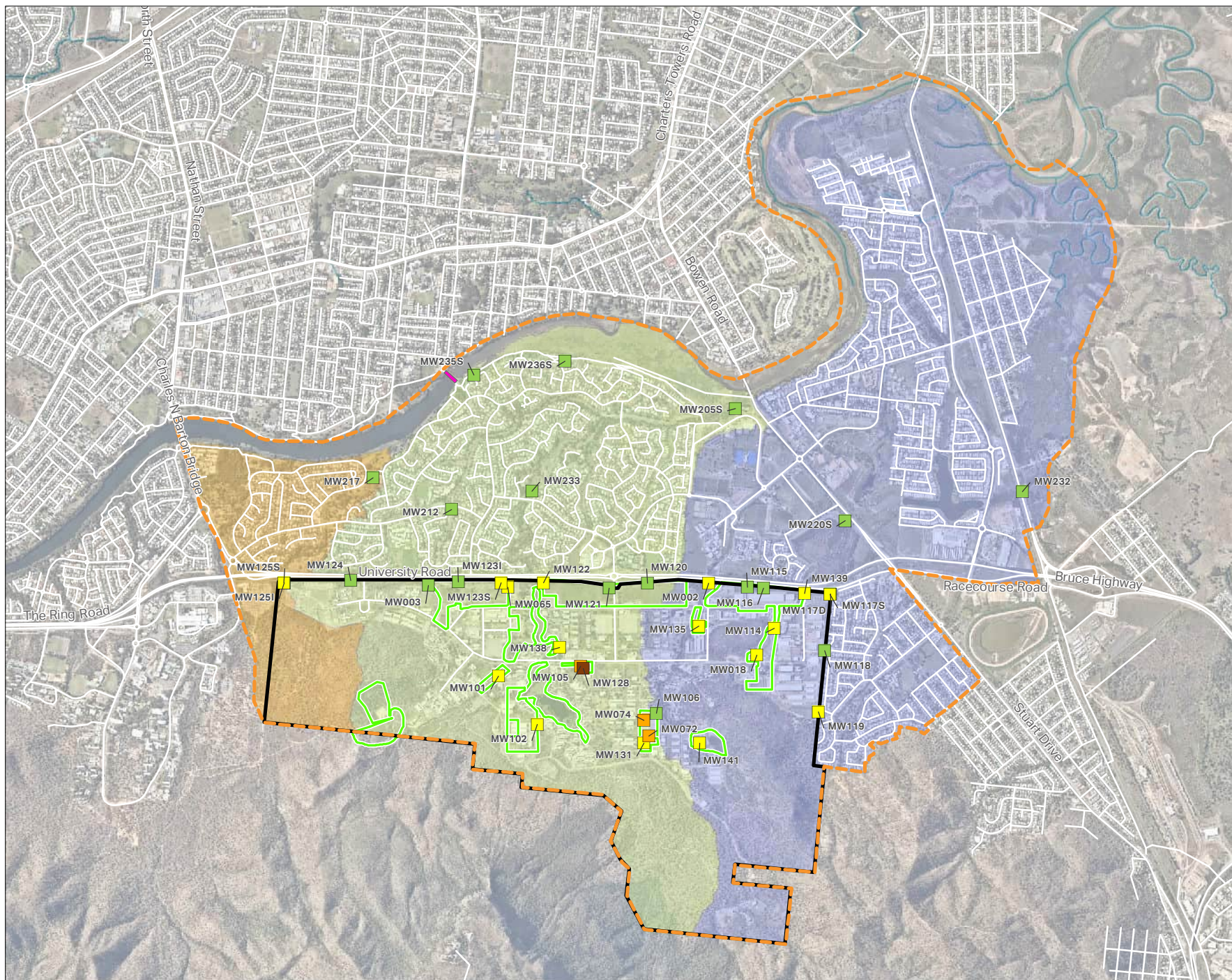
PROJECT NAME:
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Legend

- Base Boundary
- Management Area
- Aplin's Weir
- Source Areas
- Sub-catchments**
- A and West
- G and Central
- J/K and East
- Watercourse

Concentrations of PFOS + PFHxS (µg/L)

- > 50
- > 10 - 50
- > 0.07 - 10
- > LOR - 0.07
- < LOR

**FIGURE F16:
GROUNDWATER
CONCENTRATIONS OF
PFOS+PFHxS –
FEBRUARY - APRIL 2022**

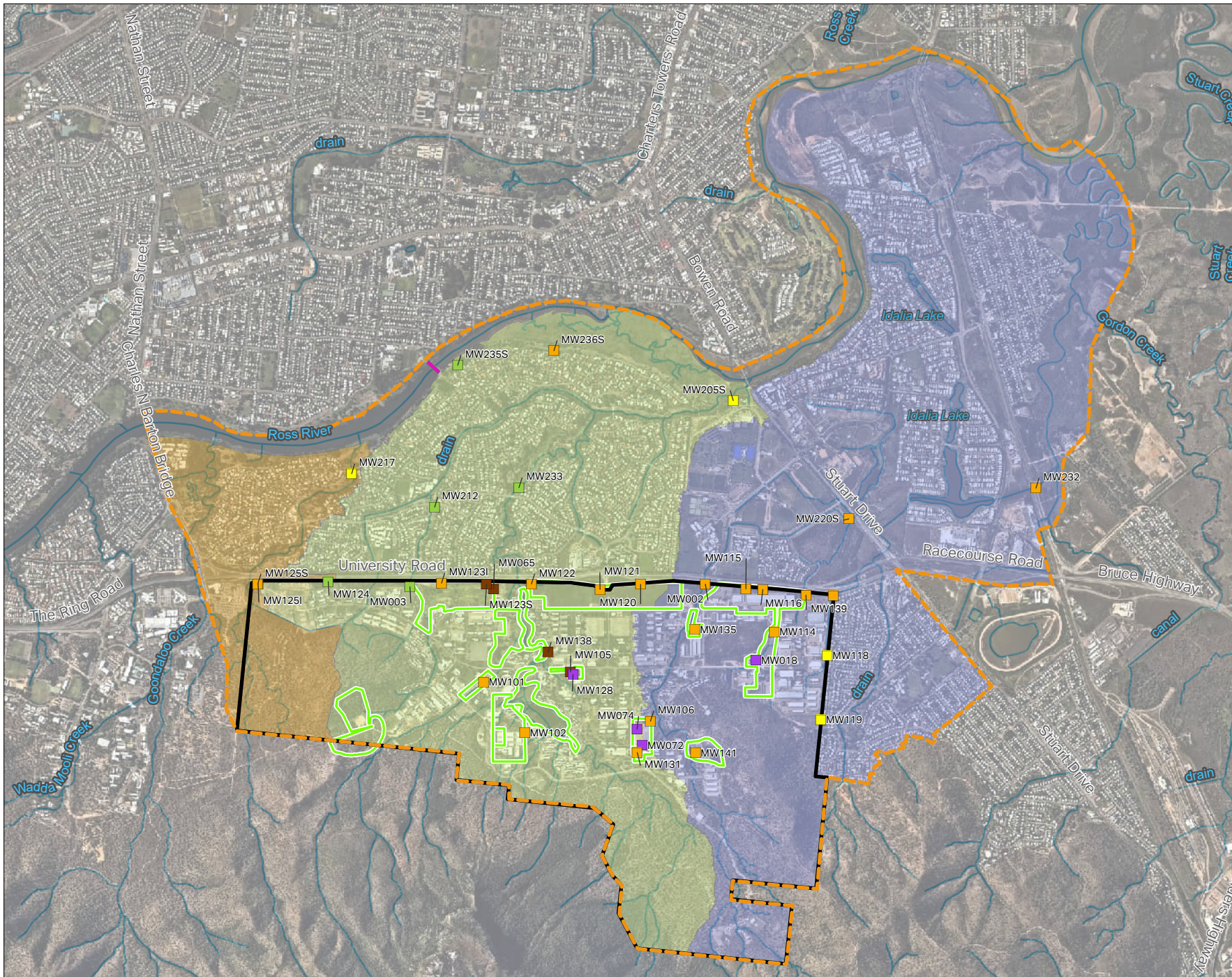
PROJECT NAME:
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PROJECT NUMBER:
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Legend

- Base Boundary
- Management Area
- Aplin's Weir
- Source Areas
- Sub-catchments**
- A and West
- G and Central
- J/K and East
- Watercourse

Concentrations of PFOA (µg/L)

- >50
- >10 - 50
- > 0.56 - 10
- > LOR - 0.56
- < LOR

**FIGURE F17:
GROUNDWATER
CONCENTRATIONS OF
PFOA –
FEBRUARY - APRIL 2022**

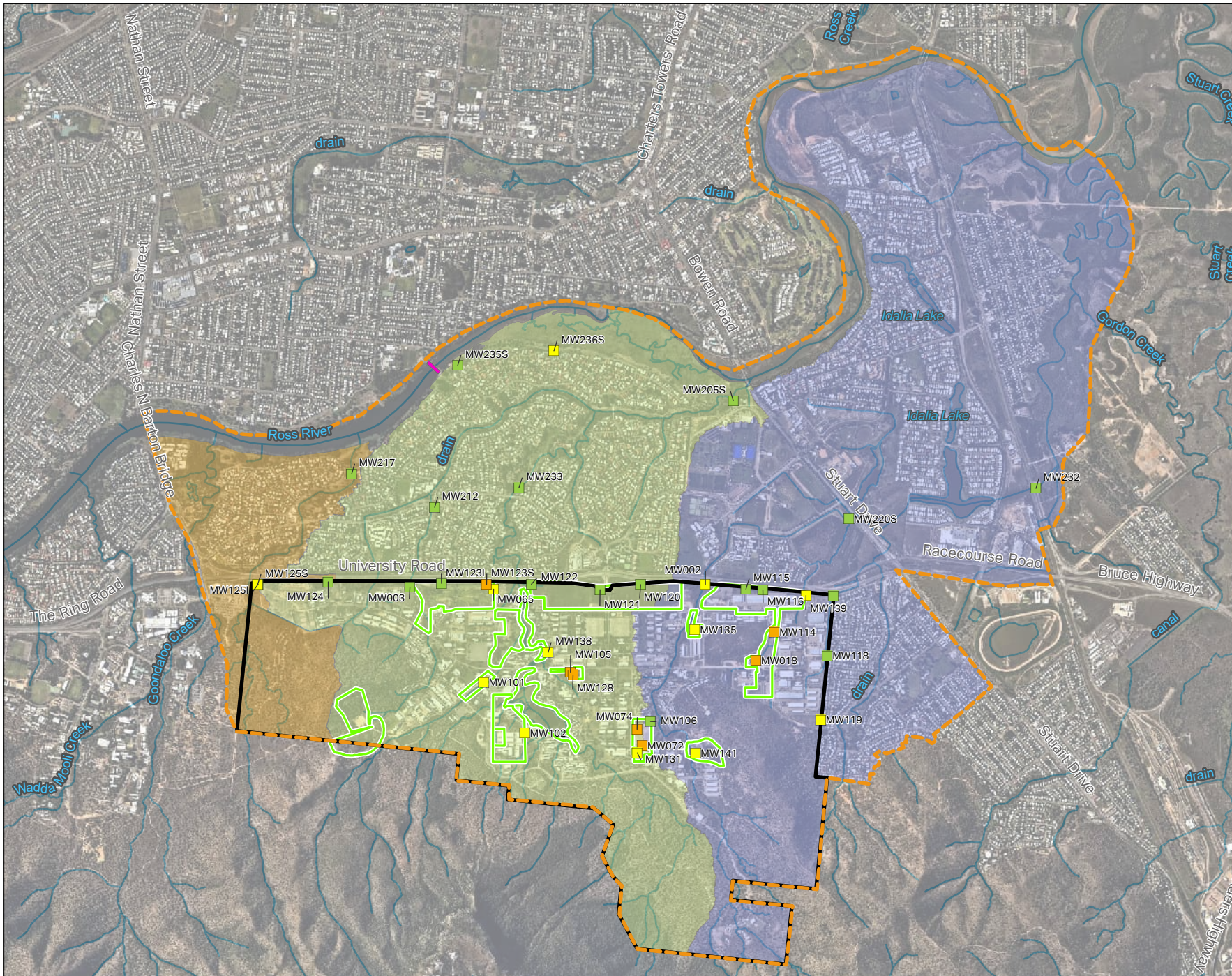
PROJECT NAME:
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Legend

- Base Boundary
- Management Area
- Aplin's Weir
- Source Areas
- Sub-catchments**
- A and West
- G and Central
- J/K and East
- Watercourse
- Concentrations of PFOS +PFHxS (µg/L)**
- > 50
- > 10 - 50
- > 0.07 - 10
- > LOR - 0.07
- < LOR
- Location not sampled

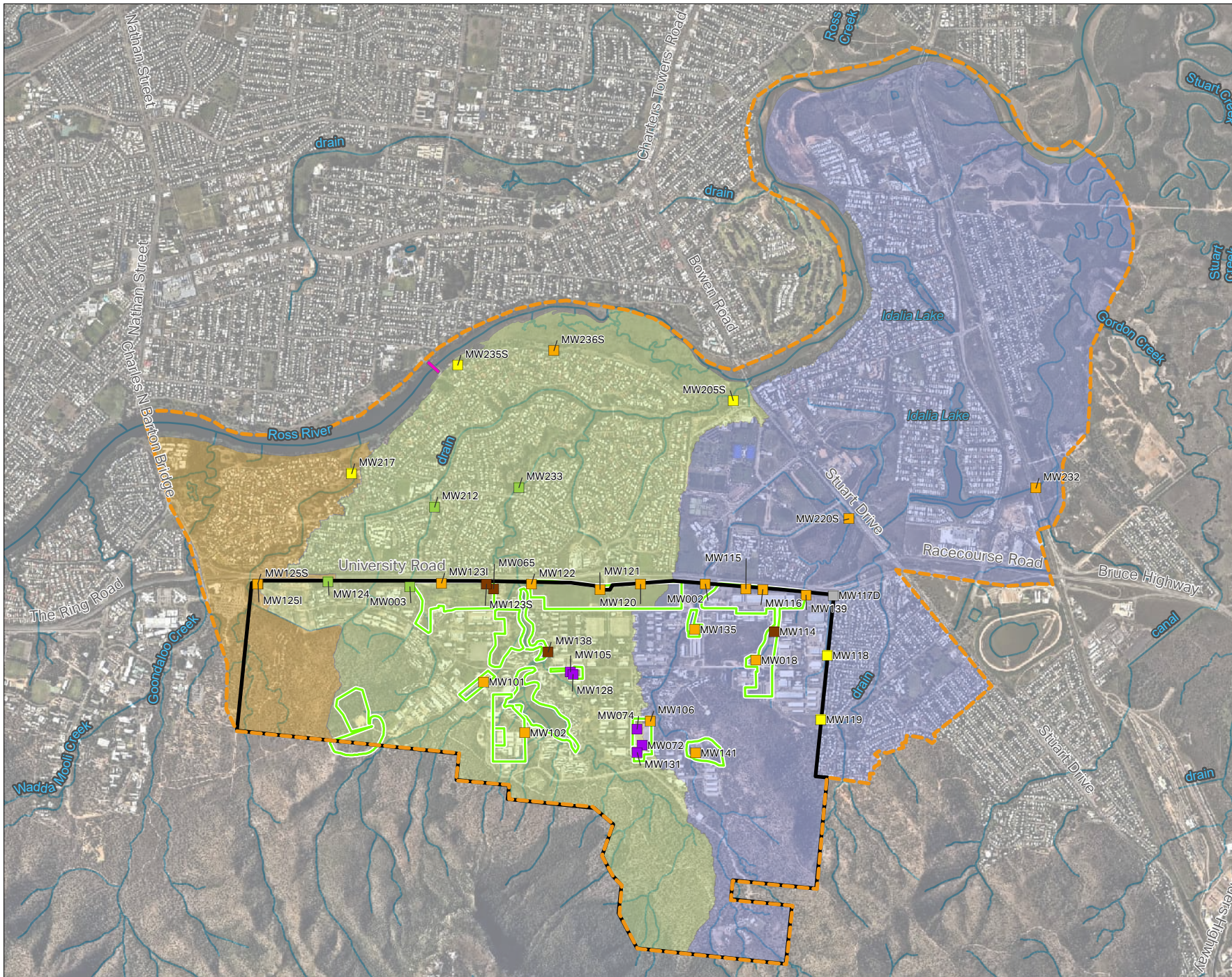
**FIGURE F18:
GROUNDWATER
CONCENTRATIONS OF
PFOS+PFHxS –
AUGUST - OCTOBER 2022**

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Legend

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- Management Area
- Aplin's Weir
- Source Areas
- Sub-catchments**
- A and West
- G and Central
- J/K and East
- Watercourse

Concentrations of PFOA (µg/L)

- > 50
- > 10 - 50
- > 0.56 - 10
- > LOR - 0.56
- < LOR
- Location not sampled

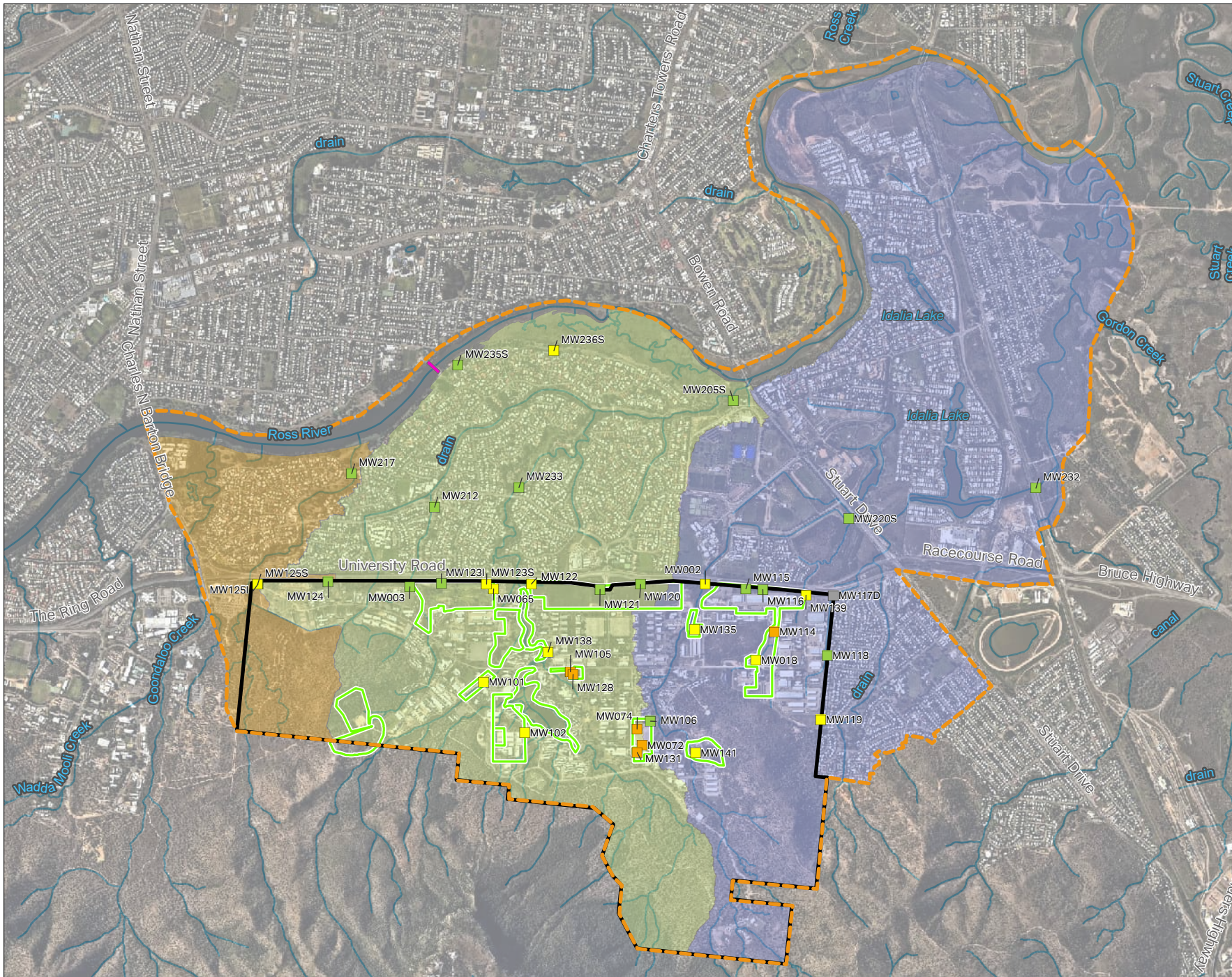
**FIGURE F19:
GROUNDWATER
CONCENTRATIONS OF
PFOA –
AUGUST - OCTOBER 2022**

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Legend

- Base Boundary
- Management Area
- Aplin's Weir
- Source Areas
- Sub-catchments**
- A and West
- G and Central
- J/K and East
- Watercourse

Concentrations of PFOS +PFHxS (µg/L)

- > 50
- > 10 - 50
- > 0.07 - 10
- > LOR - 0.07
- < LOR
- Location not sampled

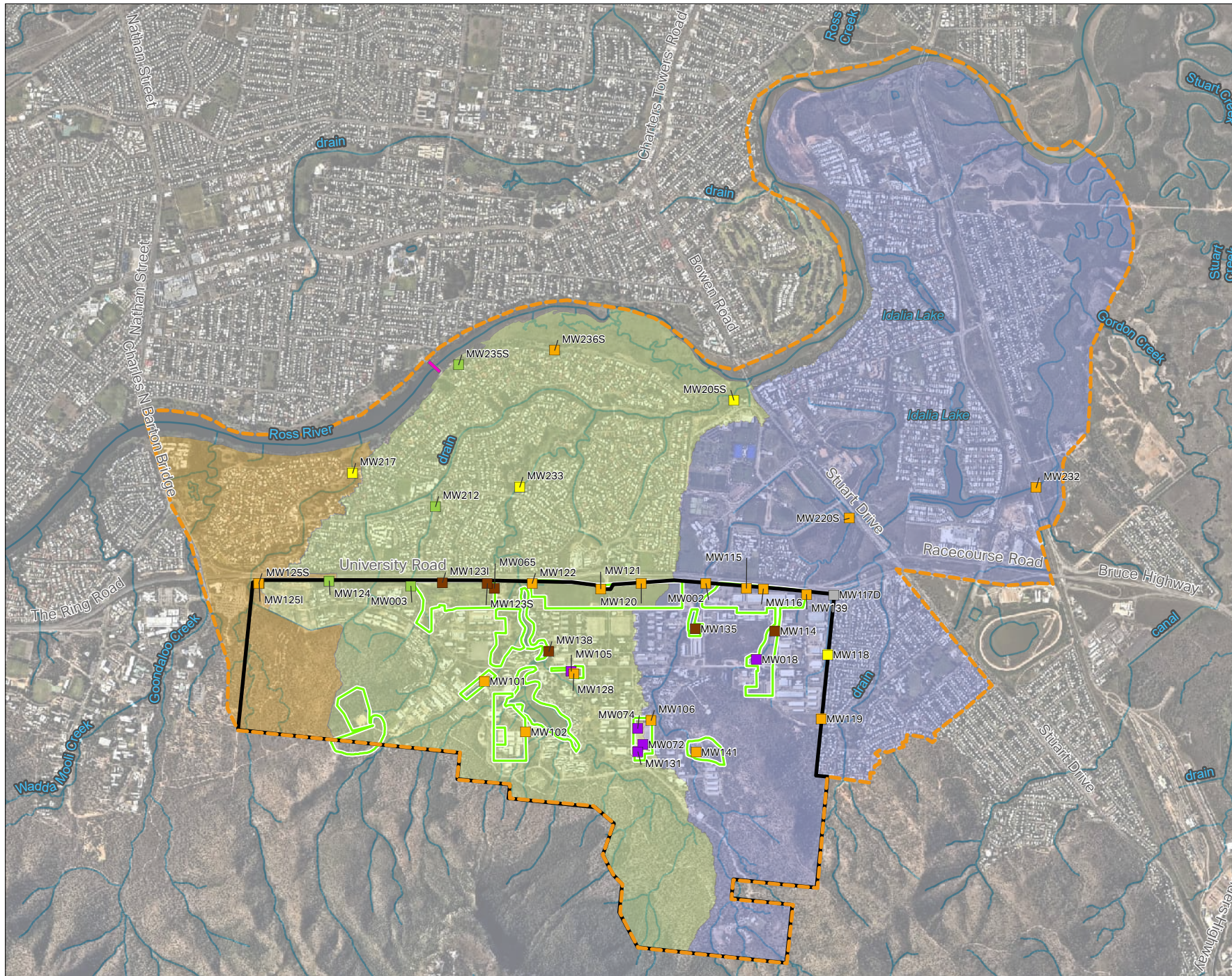
FIGURE F20: GROUNDWATER CONCENTRATIONS OF PFOS+PFHxS – MARCH 2023

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Legend

- Base Boundary
- Management Area
- Aplin's Weir
- Source Areas
- Sub-catchments**
- A and West
- G and Central
- J/K and East
- Watercourse

Concentrations of PFOA (µg/L)

- > 50
- > 10 - 50
- > 0.56 - 10
- > LOR - 0.56
- < LOR
- Location not sampled

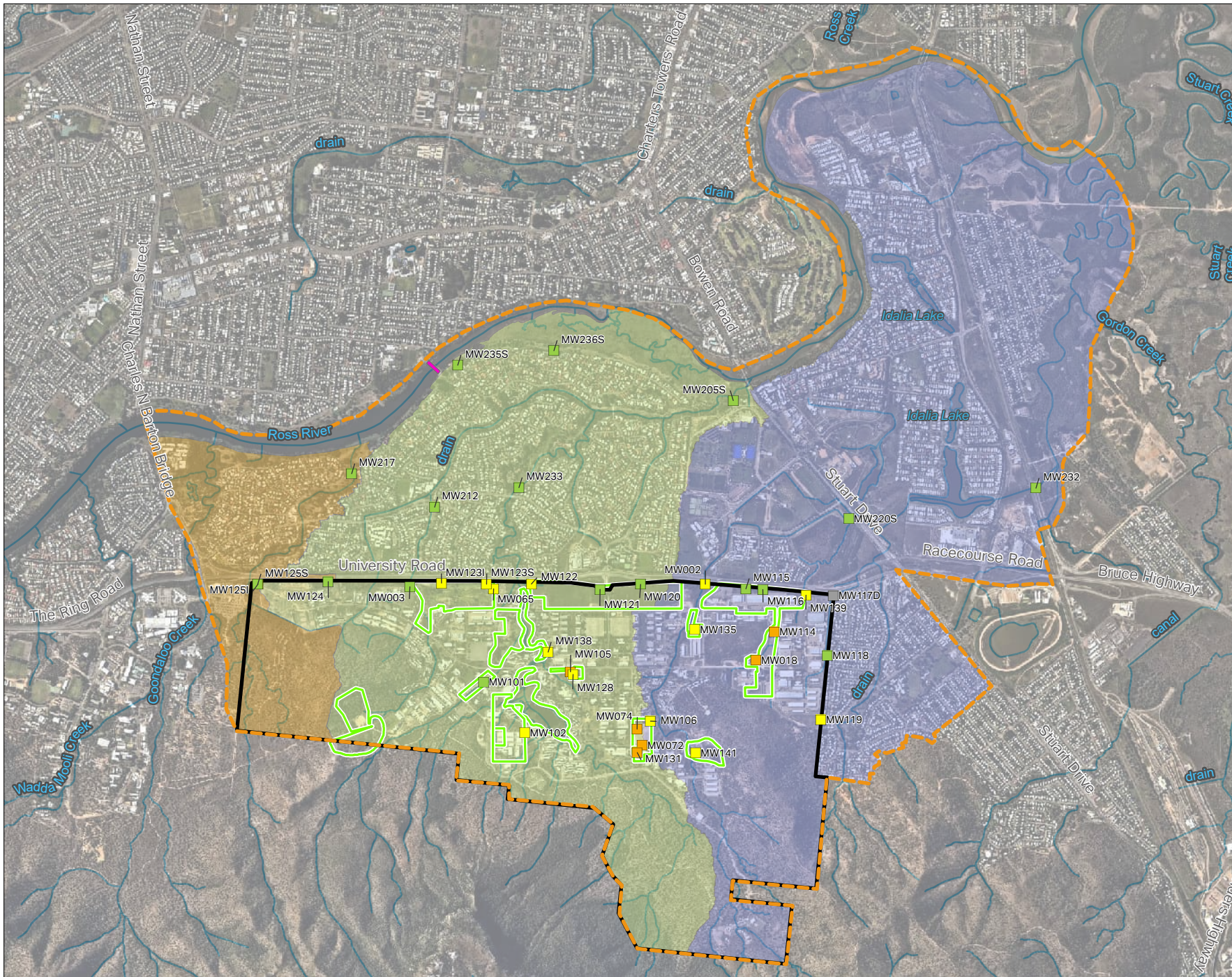
FIGURE F21:
GROUNDWATER
CONCENTRATIONS OF
PFOA –
MARCH 2022

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Legend

- Base Boundary
- Management Area
- Aplin's Weir
- Source
- Sub-catchments**
 - A and West
 - G and Central
 - J/K and East
- Concentrations of PFOS +PFHxS (µg/L)**
 - > 50
 - > 10 - 50
 - > 0.07 - 10
 - > LOR - 0.07
 - < LOR
 - Location not sampled

**FIGURE F22:
SURFACE WATER
CONCENTRATIONS OF
PFOS+PFHXS –
OCTOBER 2020**

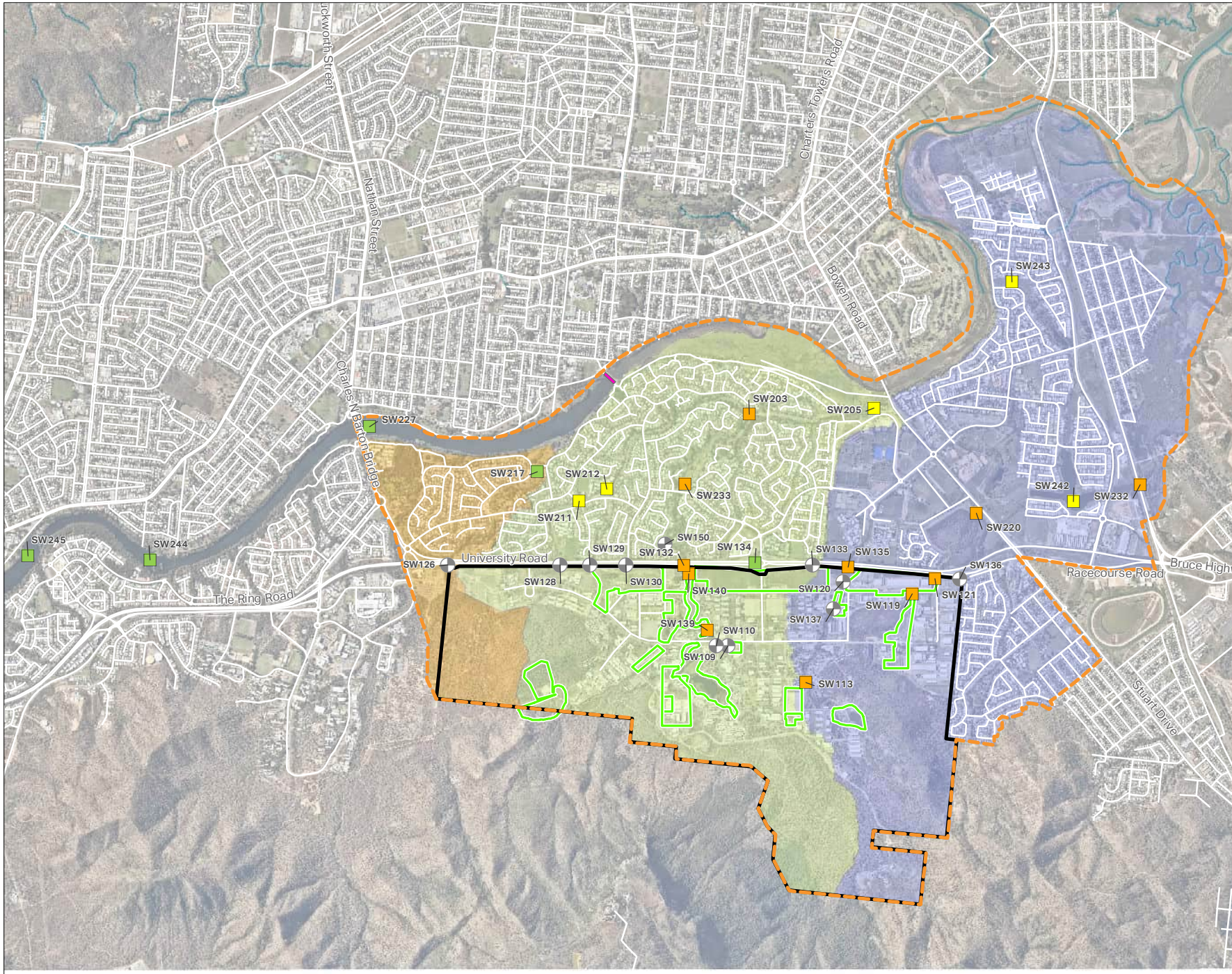
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Legend

- Base Boundary
- Management
- Aplin's Weir
- Source Areas
- Sub-catchments**
- A and West
- G and Central
- J/K and East
- Concentrations of PFOA (µg/L)**
- > 50
- > 10 - 50
- > 0.56 - 10
- > LOR - 0.56
- < LOR
- Location not sampled

**FIGURE F23:
SURFACE WATER
CONCENTRATIONS OF
PFOA – OCTOBER
2020**

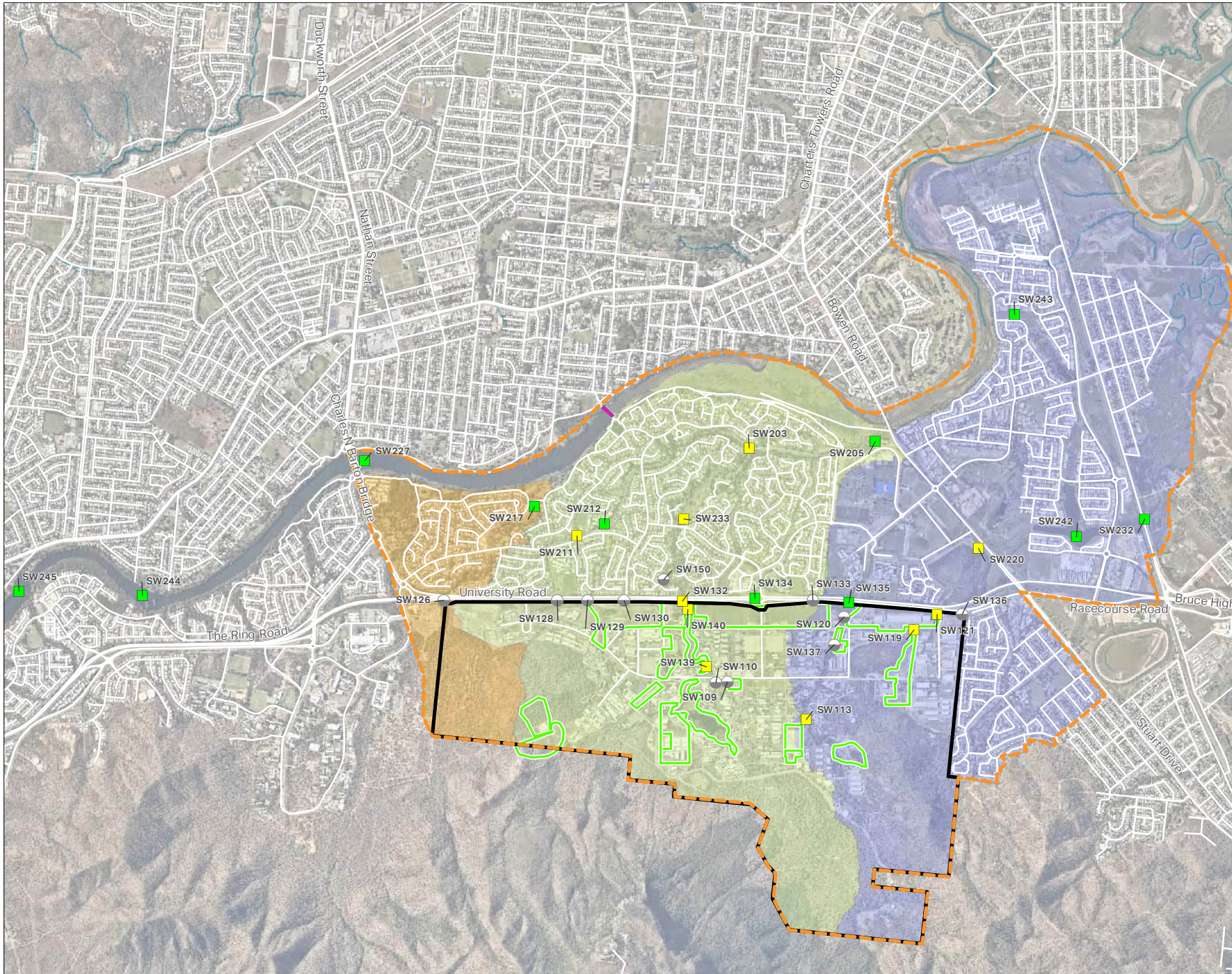
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Lavarack Barracks
CLIENT NAME:
Department of Defence
PROJECT NUMBER:
60612487

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Legend

Base Boundary

Management

Aplin's Weir

Source

Sub-catchments

A and West

G and Central

J/K and East

Concentrations of PFOS +PFHxS (µg/L)

> 50

> 10 - 50

> 0.07 - 10

> LOR - 0.07

< LOR

Location not sampled

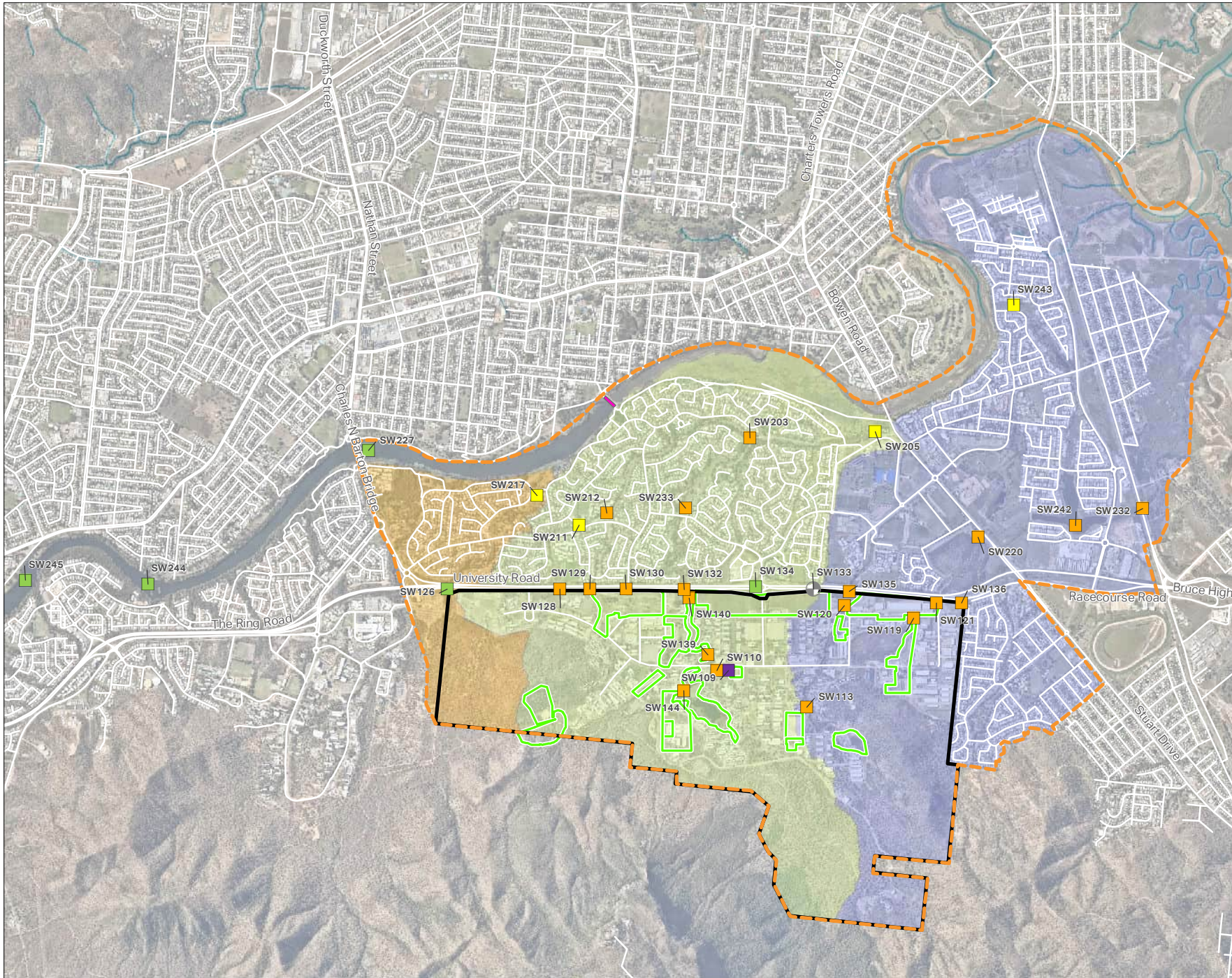


FIGURE F24:
SURFACE WATER
CONCENTRATIONS OF
PFOS+PFHxS –
MARCH-APRIL 2021

PROJECT NAME:
 PFAS OMP
REPORT NAME:
 Ongoing Monitoring Interpretive
 Report (October 2020 - March 2023) -
 Lavarack Barracks
CLIENT NAME:
 Department of Defence
PROJECT NUMBER:
 60612487

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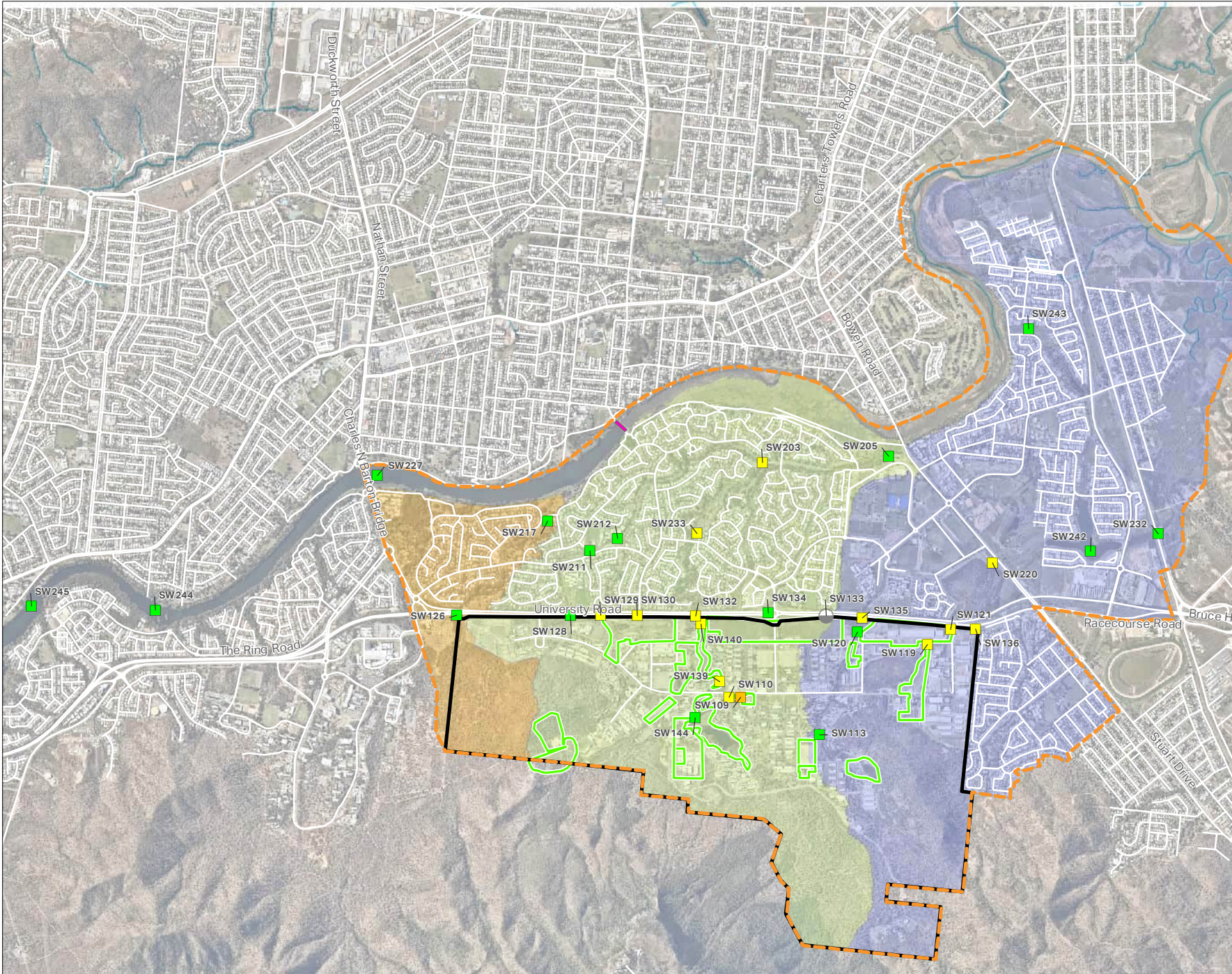
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Source:
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Legend

- Base Boundary
- Management
- Aplin's Weir
- Source Areas
- Sub-catchments**
- A and West
- G and Central
- J/K and East
- Concentration of PFOA (µg/L)**
- > 50
- > 10 - 50
- > 0.56 - 10
- > LOR - 0.56
- < LOR
- Location not sampled



**FIGURE F25:
SURFACE WATER
CONCENTRATIONS OF
PFOA – MARCH-APRIL
2021**

PROJECT NAME:
PFAS OMP
REPORT NAME:
Ongoing Monitoring Interpretive
Report (October 2020 - March 2023) -
Lavarack Barracks
CLIENT NAME:
Department of Defence
PROJECT NUMBER:
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Legend

Base Boundary

Management

Aplin's Weir

Source Areas

Sub-catchments

A and West

G and Central

J/K and East

Concentrations of PFOS +PFHxS (µg/L)

> 50

> 10 - 50

> 0.07 - 10

> LOR - 0.07

< LOR

Location not sampled

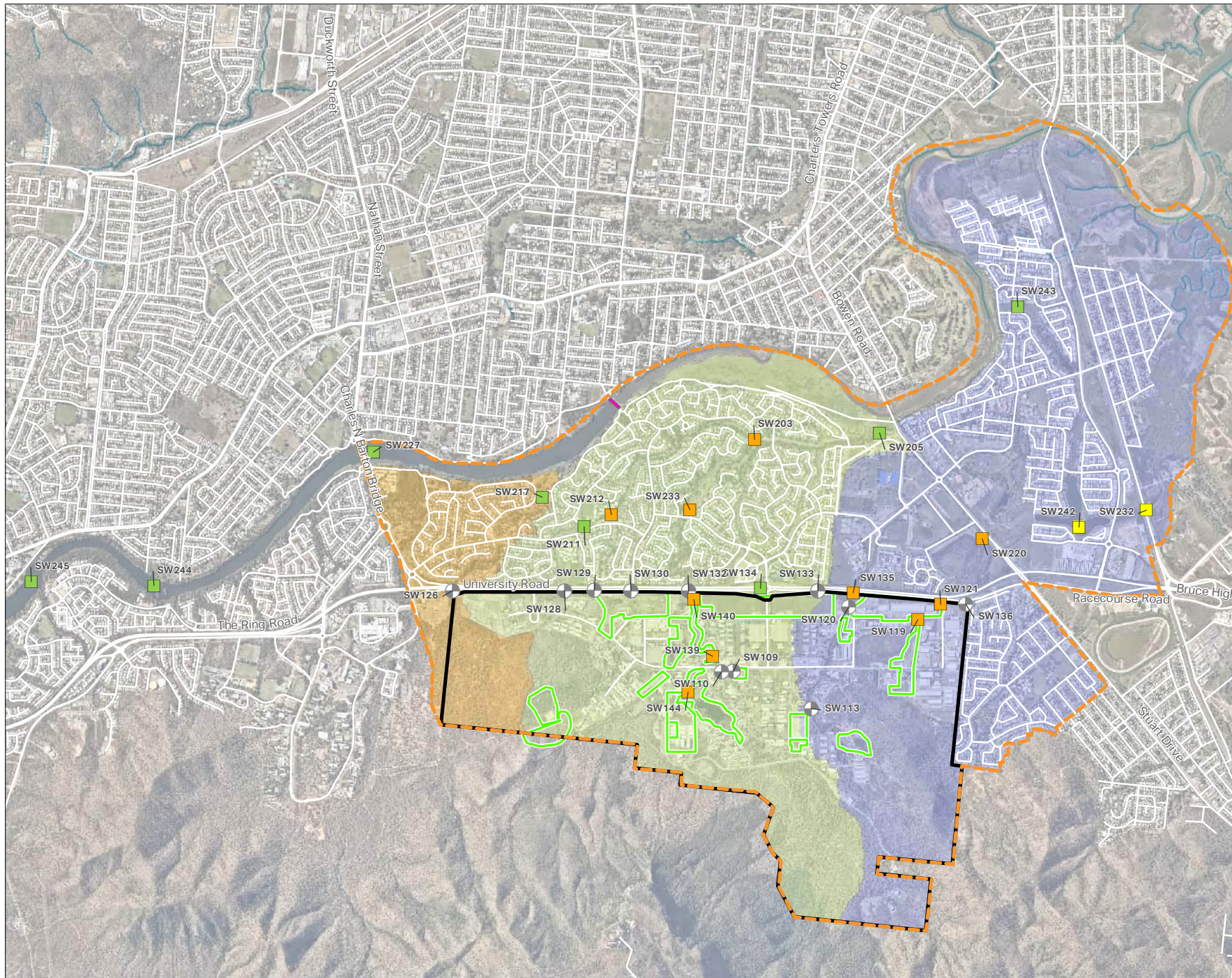


FIGURE F26:
SURFACE WATER
CONCENTRATIONS OF
PFOS+PFHxS –
AUGUST 2021

PROJECT NAME:
 PFAS OMP
REPORT NAME:
 Ongoing Monitoring Interpretive
 Report (October 2020 - March 2023) -
 Lavarack Barracks
CLIENT NAME:
 Department of Defence
PROJECT NUMBER:
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Legend

- Base Boundary
- Management
- Aplin's Weir
- Source Areas
- Sub-catchments**
- A and West
- G and Central
- J/K and East
- Concentration of PFOA (µg/L)**
- > 50
- > 10 - 50
- > 0.56 - 10
- > LOR - 0.56
- < LOR
- Location not sampled

FIGURE F27:
SURFACE WATER
CONCENTRATIONS OF
PFOA – AUGUST 2021

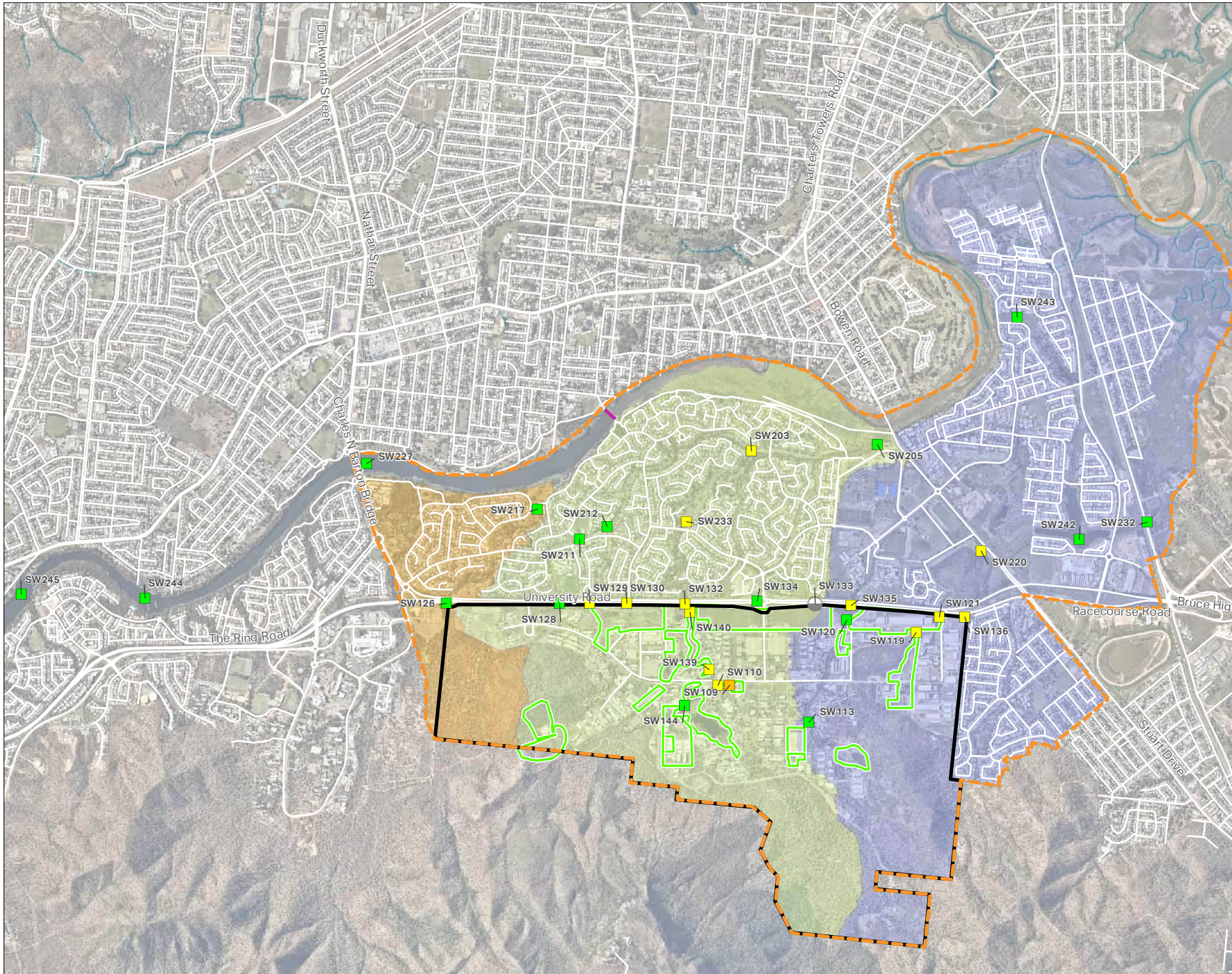
PROJECT NAME:
 PFAS OMP
REPORT NAME:
 Ongoing Monitoring Interpretive
 Report (October 2020 - March 2023) -
 Lavarack Barracks
CLIENT NAME:
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PROJECT NUMBER:
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Legend

- Base Boundary
- Management Area
- Aplin's Weir
- Source Areas
- Sub-catchments**
 - A and West
 - G and Central
 - J/K and East
 - Watercourse

Concentrations of PFOS +PFHxS (µg/L)

- >50
- >10 - 50
- > 0.07 - 10
- >LOR - 0.07
- < LOR

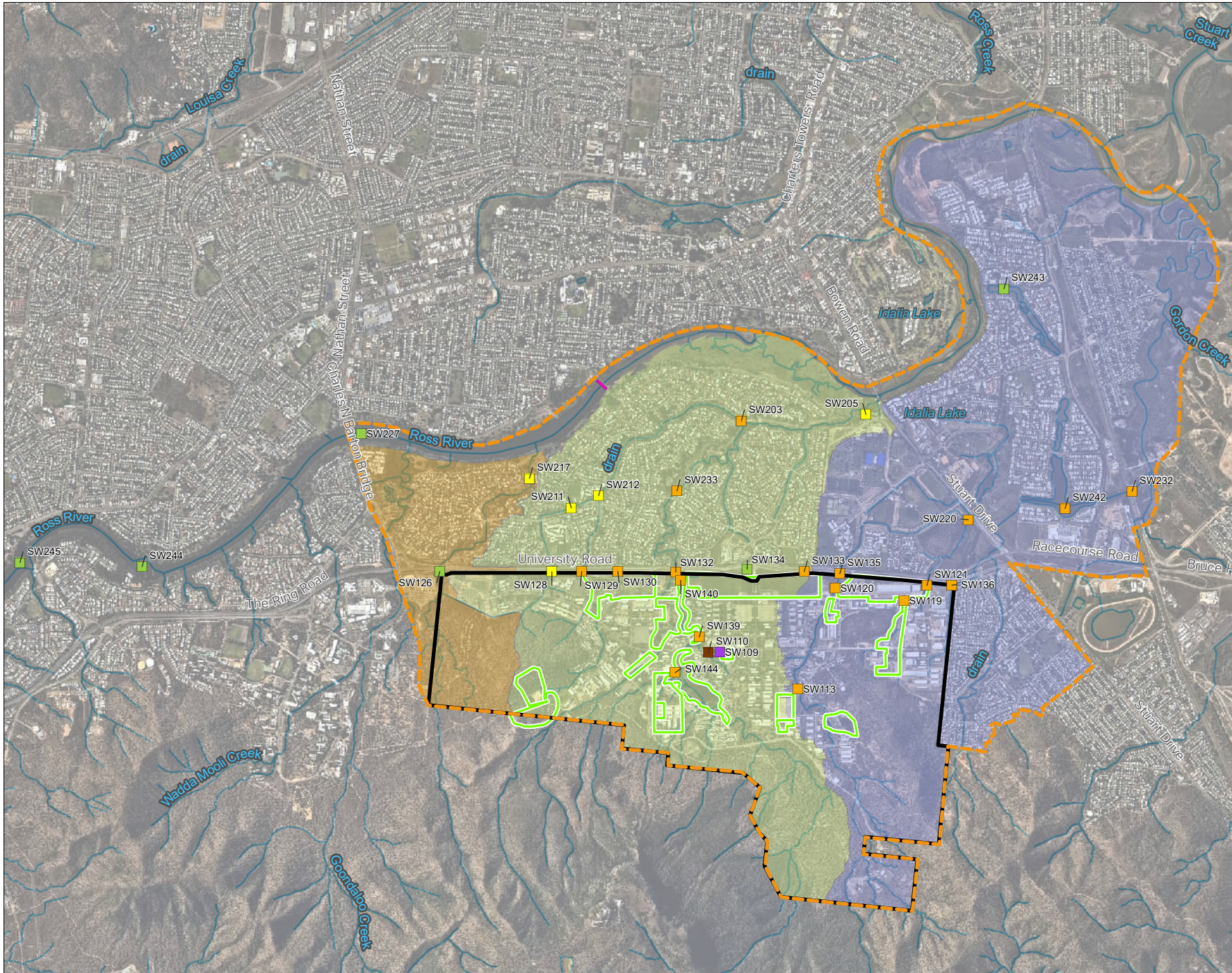
FIGURE F28:
SURFACE WATER
CONCENTRATIONS OF
PFOS+PFHxS –
FEBRUARY - APRIL 2022

PROJECT NAME:
 PFAS OMP
REPORT NAME:
 Ongoing Monitoring Interpretive
 Report (October 2020 - March 2023) -
 Lavarack Barracks
CLIENT NAME:
 Department of Defence
PROJECT NUMBER:
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Legend

- Base Boundary
- Management Area
- Aplin's Weir
- Source Areas
- Sub-catchments**
- A and West
- G and Central
- J/K and East
- Watercourse

Concentrations of PFOA (µg/L)

- > 50
- > 10 - 50
- > 0.56 - 10
- > LOR - 0.56
- < LOR

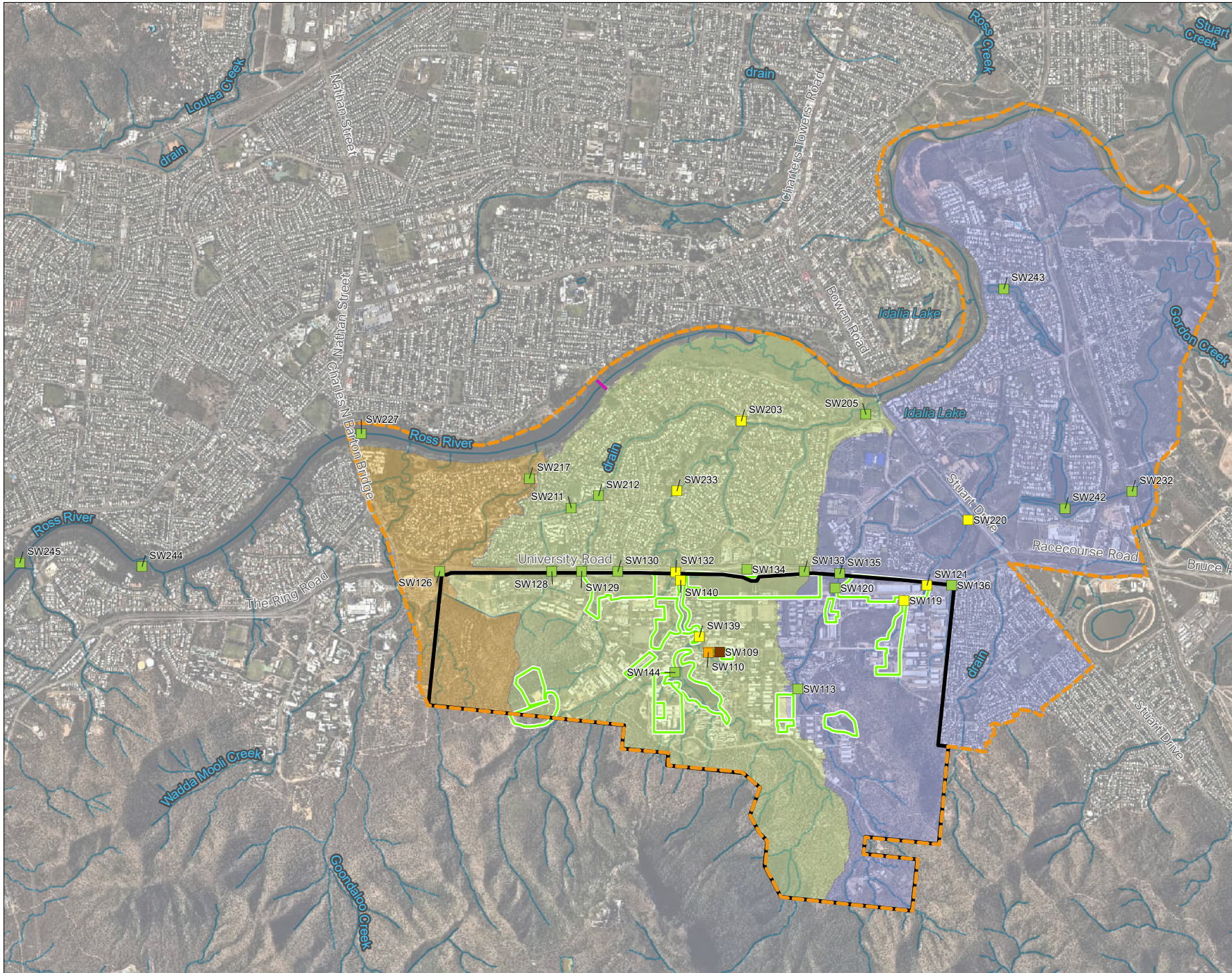
**FIGURE F29:
SURFACE WATER
CONCENTRATIONS OF
PFOA –
FEBRUARY - APRIL 2022**

PROJECT NAME:
PFAS OMP
REPORT NAME:
Ongoing Monitoring Interpretive
Report (October 2020 - March 2023) -
Lavarack Barracks
CLIENT NAME:
Department of Defence
PROJECT NUMBER:
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Legend

- Base Boundary
- Management Area
- Aplin's Weir
- Source Areas
- Sub-catchments**
 - A and West
 - G and Central
 - J/K and East
 - Watercourse

Concentrations of PFOS + PFHxS (µg/L)

- > 50
- > 10 - 50
- > 0.07 - 10
- > LOR - 0.07
- < LOR
- Location not sampled

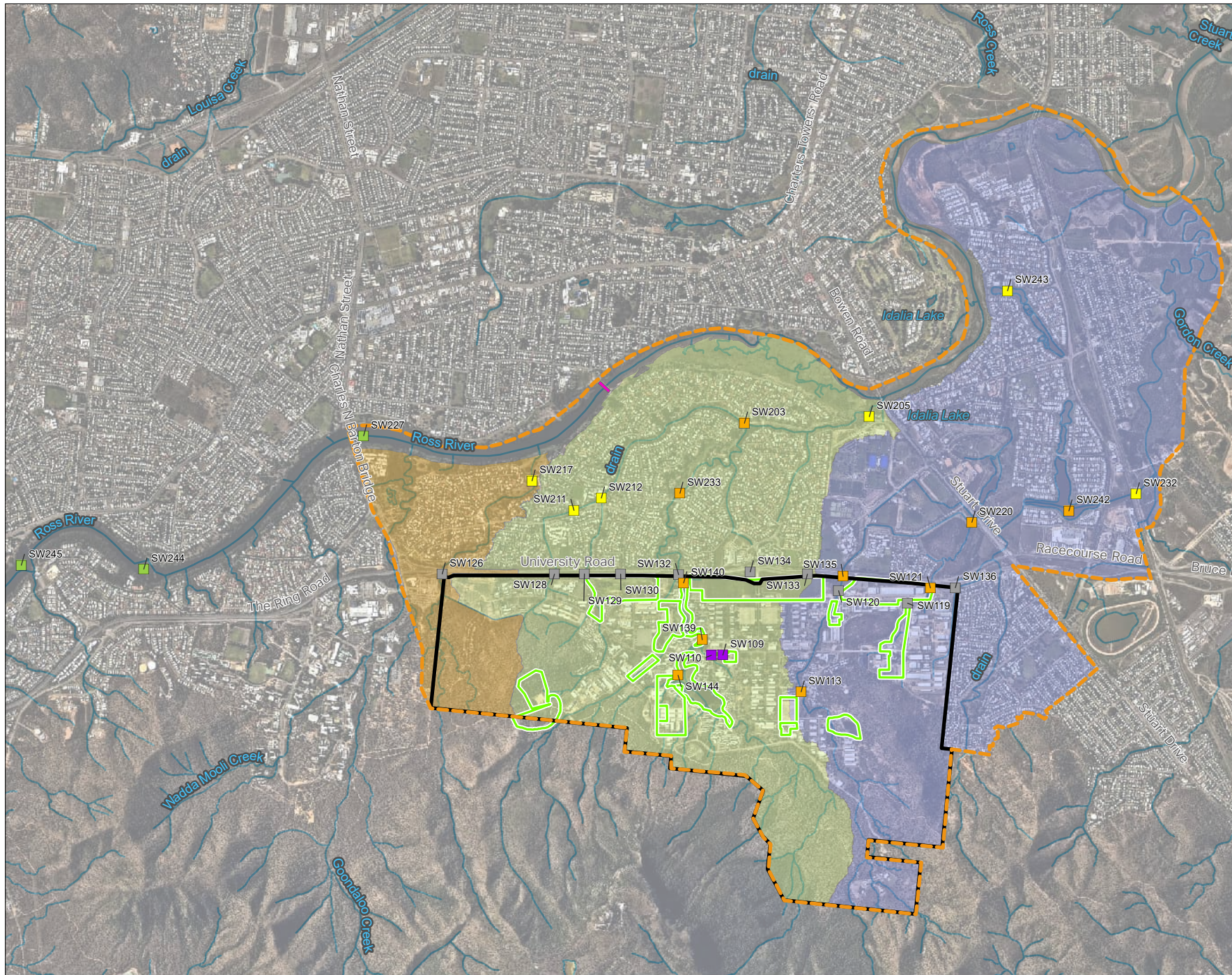
**FIGURE F30:
SURFACE WATER
CONCENTRATIONS OF
PFOS+PFHxS –
AUGUST - OCTOBER 2022**

PROJECT NAME:
PFAS OMP
REPORT NAME:
Ongoing Monitoring Interpretive
Report (October 2020 - March 2023) -
Lavarack Barracks
CLIENT NAME:
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Legend

- Base Boundary
- Management Area
- Aplin's Weir
- Source Areas
- Sub-catchments**
 - A and West
 - G and Central
 - J/K and East
- Watercourse

Concentrations of PFOA (µg/L)

- > 50
- > 10 - 50
- > 0.56 - 10
- > LOR - 0.56
- < LOR
- Location not sampled

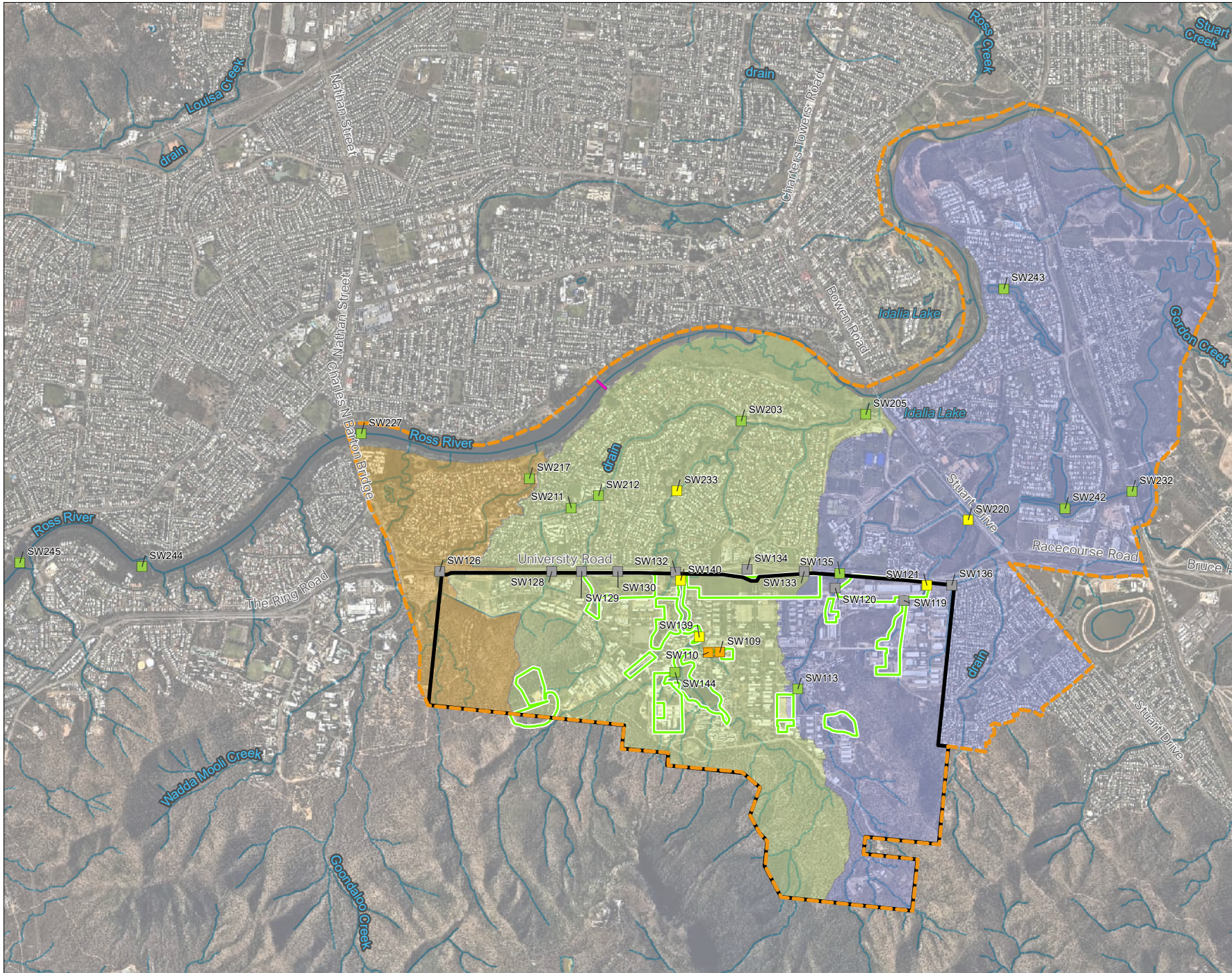
FIGURE F31:
SURFACE WATER
CONCENTRATIONS OF
PFOA –
AUGUST - OCTOBER 2022

PROJECT NAME:
 PFAS OMP
REPORT NAME:
 Ongoing Monitoring Interpretive
 Report (October 2020 - March 2023) -
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CLIENT NAME:
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Legend

- Base Boundary
- Management Area
- Aplin's Weir
- Source Areas
- Sub-catchments**
- A and West
- G and Central
- J/K and East
- Watercourse

Concentrations of PFOS + PFHxS (µg/L)

- > 50
- > 10 - 50
- > 0.07 - 10
- > LOR - 0.07
- < LOR
- Location not sampled

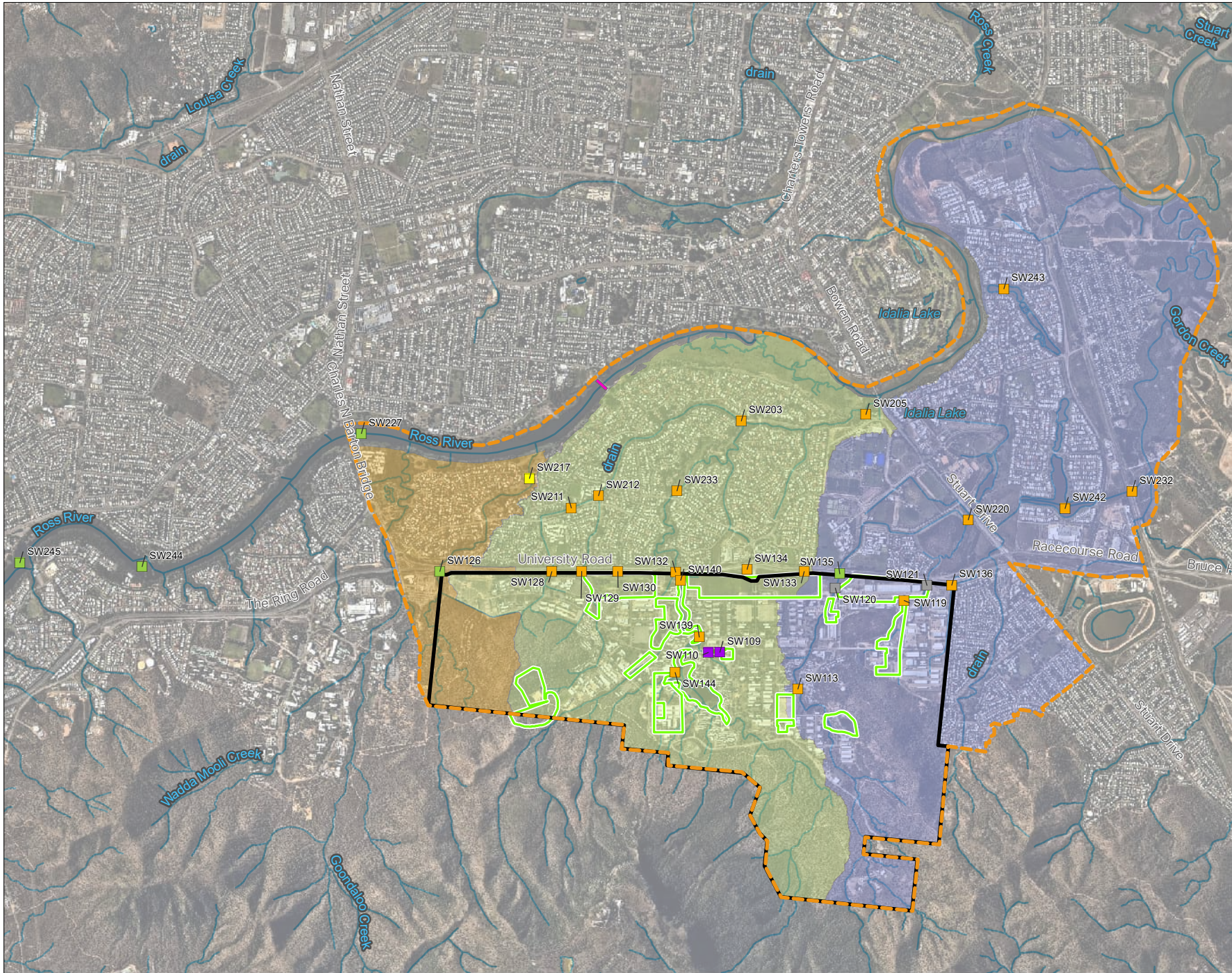
**FIGURE F32:
SURFACE WATER
CONCENTRATIONS OF
PFOS+PFHxS –
MARCH 2023**

PROJECT NAME:
PFAS OMP
REPORT NAME:
Ongoing Monitoring Interpretive
Report (October 2020 - March 2023) -
Lavarack Barracks
CLIENT NAME:
Department of Defence
PROJECT NUMBER:
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Legend

- Base Boundary
- Management Area
- Aplin's Weir
- Source Areas
- Sub-catchments**
- A and West
- G and Central
- J/K and East
- Watercourse
- Concentrations of PFOA (µg/L)**
- > 50
- > 10 - 50
- > 0.56 - 10
- > LOR - 0.56
- < LOR
- Location not sampled

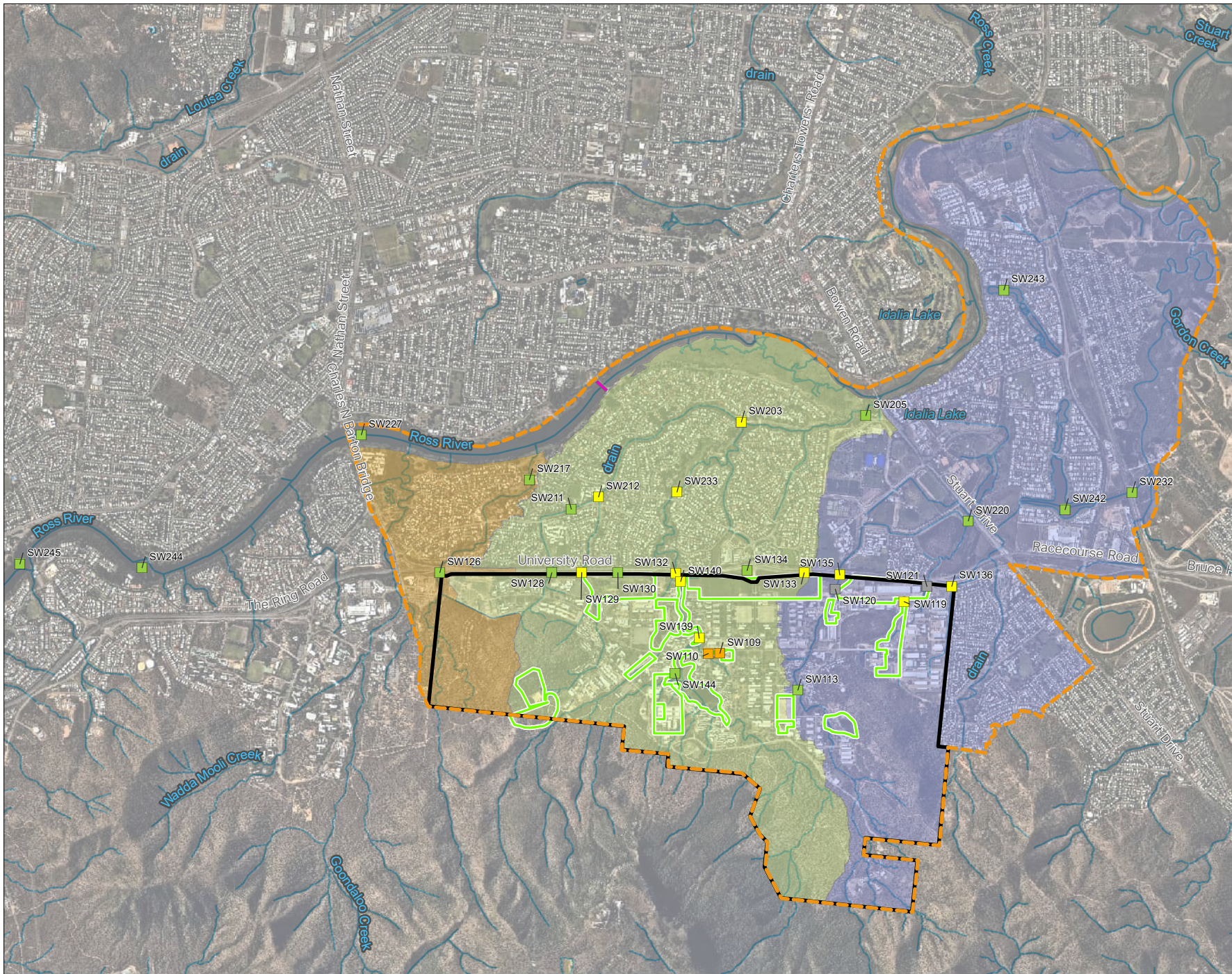
**FIGURE F33:
SURFACE WATER
CONCENTRATIONS OF
PFOA – MARCH 2023**

PROJECT NAME:
PFAS OMP
REPORT NAME:
Ongoing Monitoring Interpretive
Report (October 2020 - March 2023) -
Lavarack Barracks
CLIENT NAME:
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PROJECT NUMBER:
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Legend

- Base Boundary
- Management Area
- Aplin's Weir
- Source Areas
- Sub-catchments**
 - A and West
 - G and Central
 - J/K and East
- Concentrations of PFOS +PFHxS (mg/kg)**
 - > 1
 - > 0.01 - 1
 - > 0.001 - 0.01
 - > LOR - 0.001
 - < LOR

**FIGURE F34:
SEDIMENT
CONCENTRATIONS OF
PFOS+PFHxS –
OCTOBER 2020**

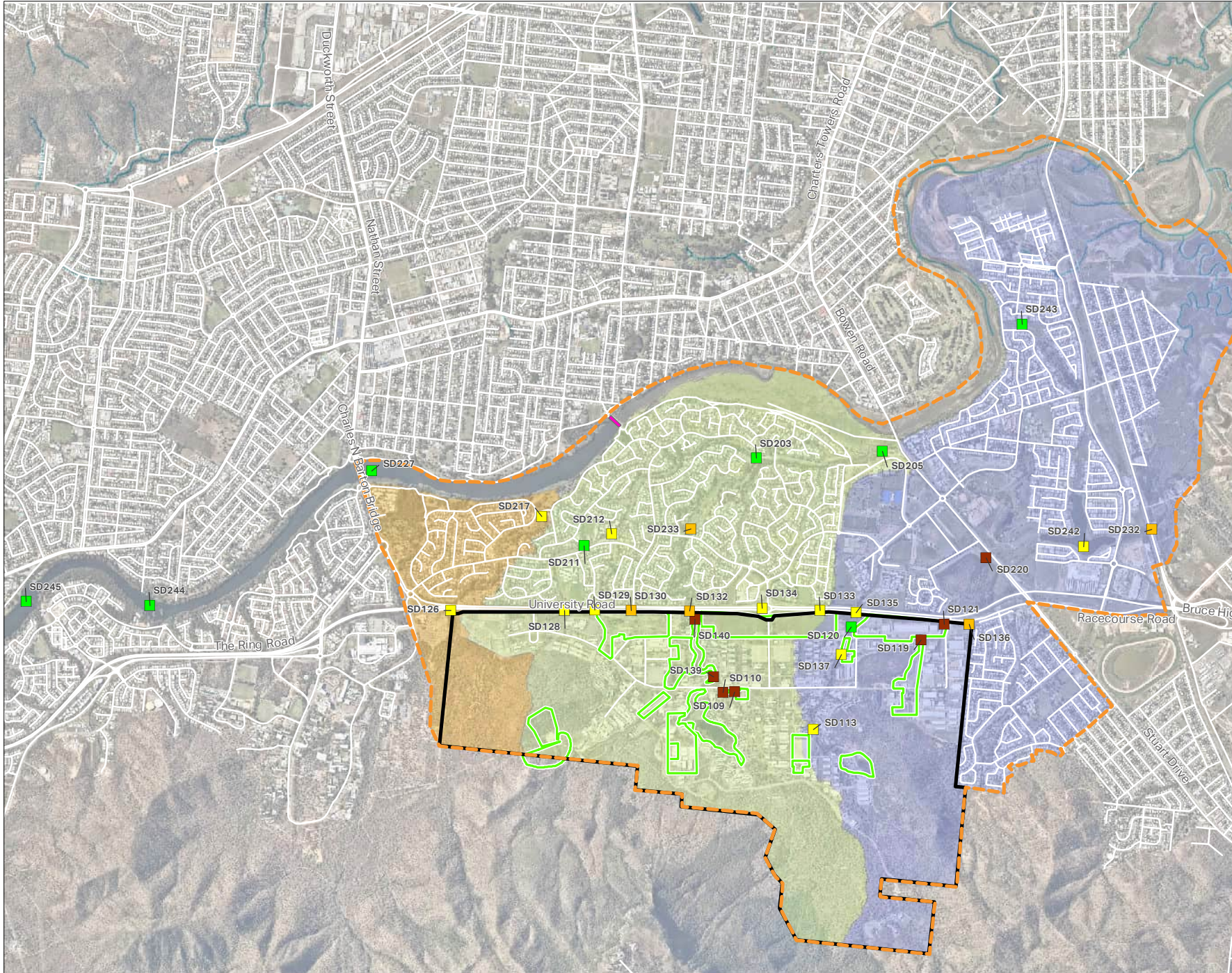
PROJECT NAME:
PFAS OMP
REPORT NAME:
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Legend

- Base Boundary
- Management Area
- Aplin's Weir
- Source Areas
- Sub-catchments**
- A and West
- G and Central
- J/K and East
- PFOA (mg/kg)**
- > 1
- > 0.01 - 1
- > 0.001 - 0.01
- > LOR - 0.001
- < LOR

**FIGURE F35:
SEDIMENT
CONCENTRATIONS OF
PFOA – OCTOBER 2020**

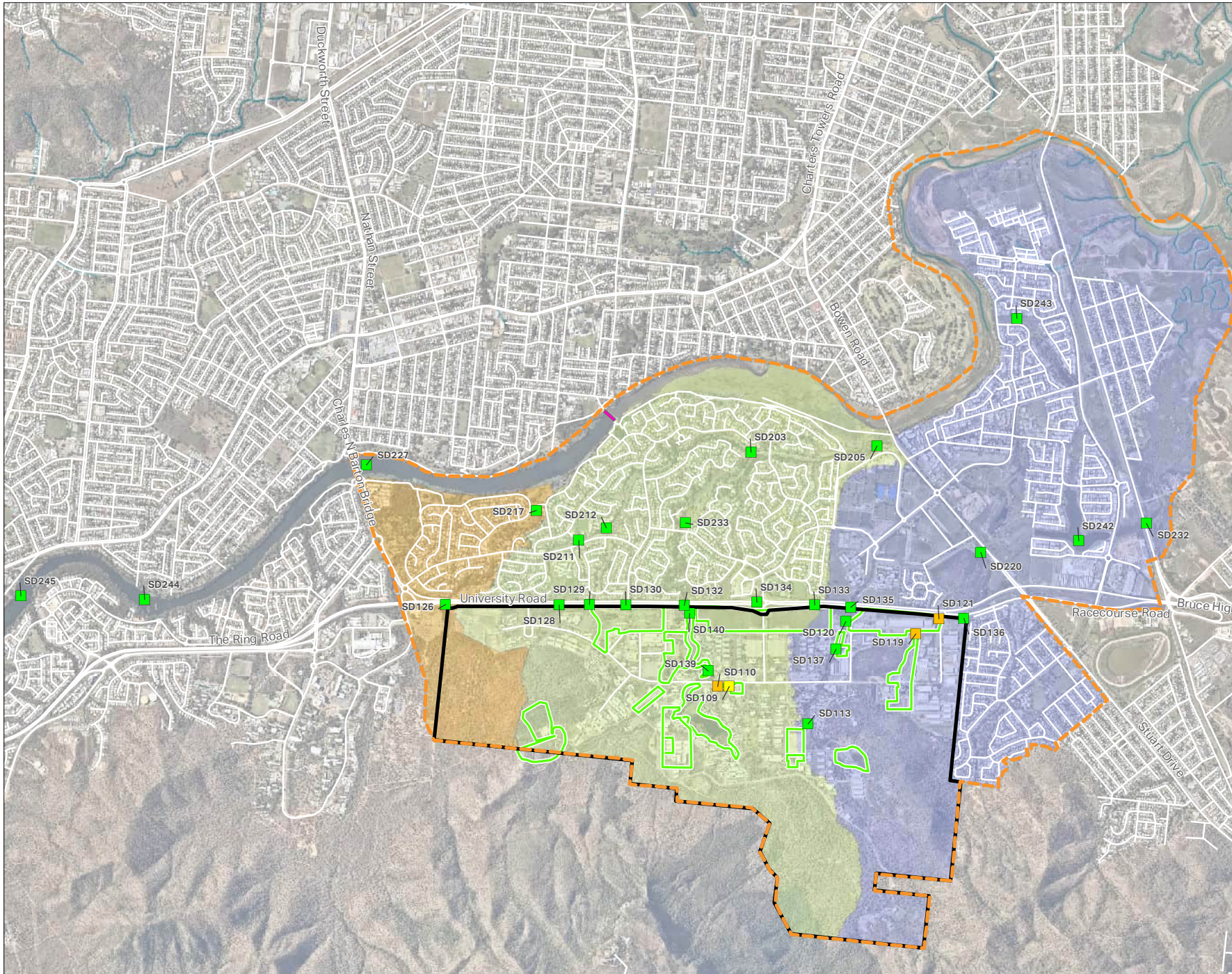
PROJECT NAME:
PFAS OMP
REPORT NAME:
Ongoing Monitoring Interpretive
Report (October 2020 - March 2023) -
Lavarack Barracks
CLIENT NAME:
Department of Defence
PROJECT NUMBER:
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Legend

- Base Boundary
- Management Area
- Aplin's Weir
- Source Areas
- Sub-catchments**
- A and West
- G and Central
- J/K and East

Concentrations of PFOS +PFHxS (mg/kg)

- > 1
- > 0.01 - 1
- > 0.001 - 0.01
- > LOR - 0.001
- < LOR

**FIGURE F36:
SEDIMENT
CONCENTRATIONS OF
PFOS+PFHxS –
MARCH-APRIL 2021**

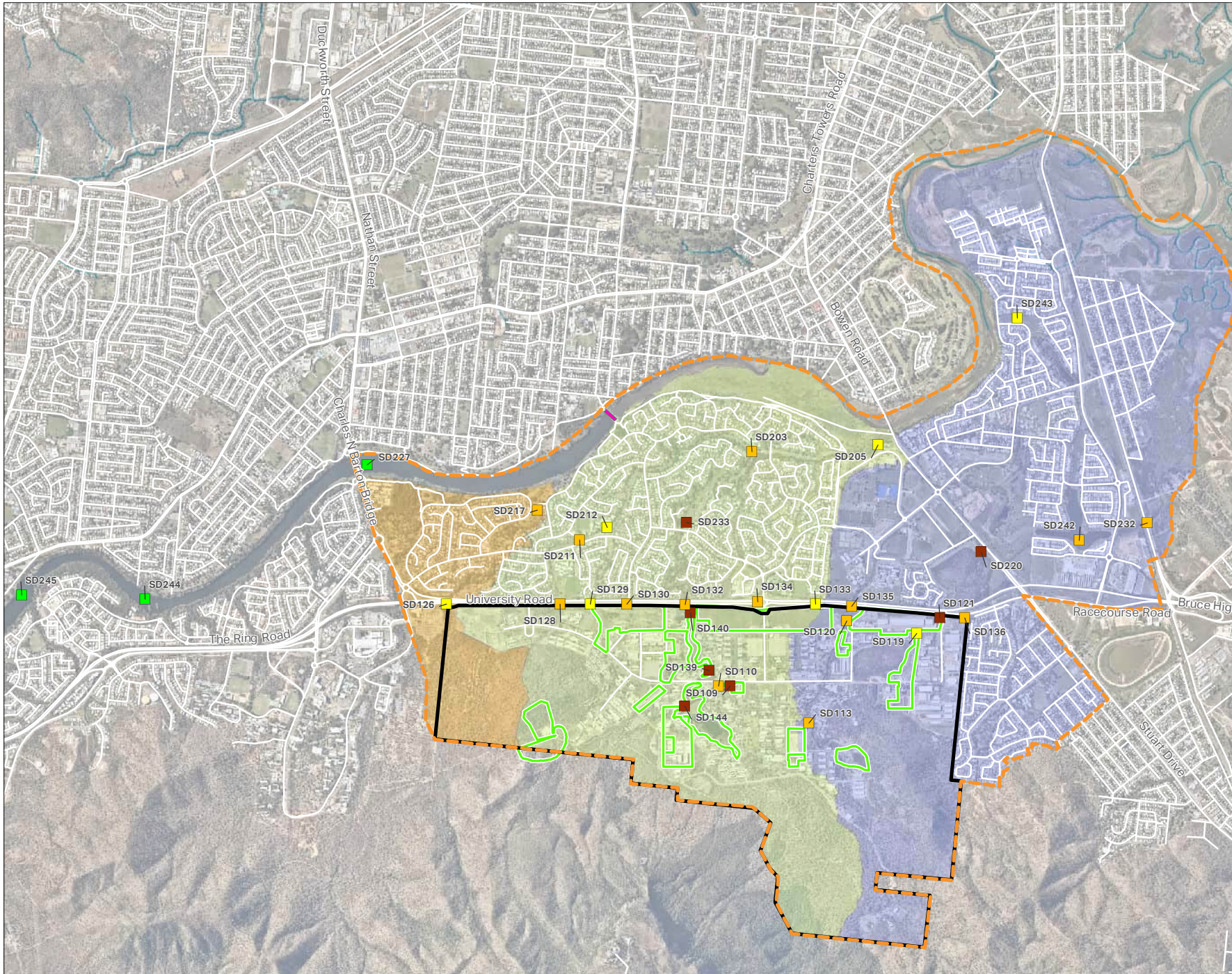
PROJECT NAME:
PFAS OMP
REPORT NAME:
Ongoing Monitoring Interpretive
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Department of Defence
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Legend

- Base Boundary
- Management Area
- Aplin's Weir
- Source Areas
- Sub-catchments**
 - A and West
 - G and Central
 - J/K and East
- PFOA (mg/kg)**
 - > 1
 - > 0.01 - 1
 - > 0.001 - 0.01
 - > LOR - 0.001
 - < LOR
 - Location not sampled

**FIGURE F37:
SEDIMENT
CONCENTRATIONS OF
PFOA – MARCH-APRIL
2021**

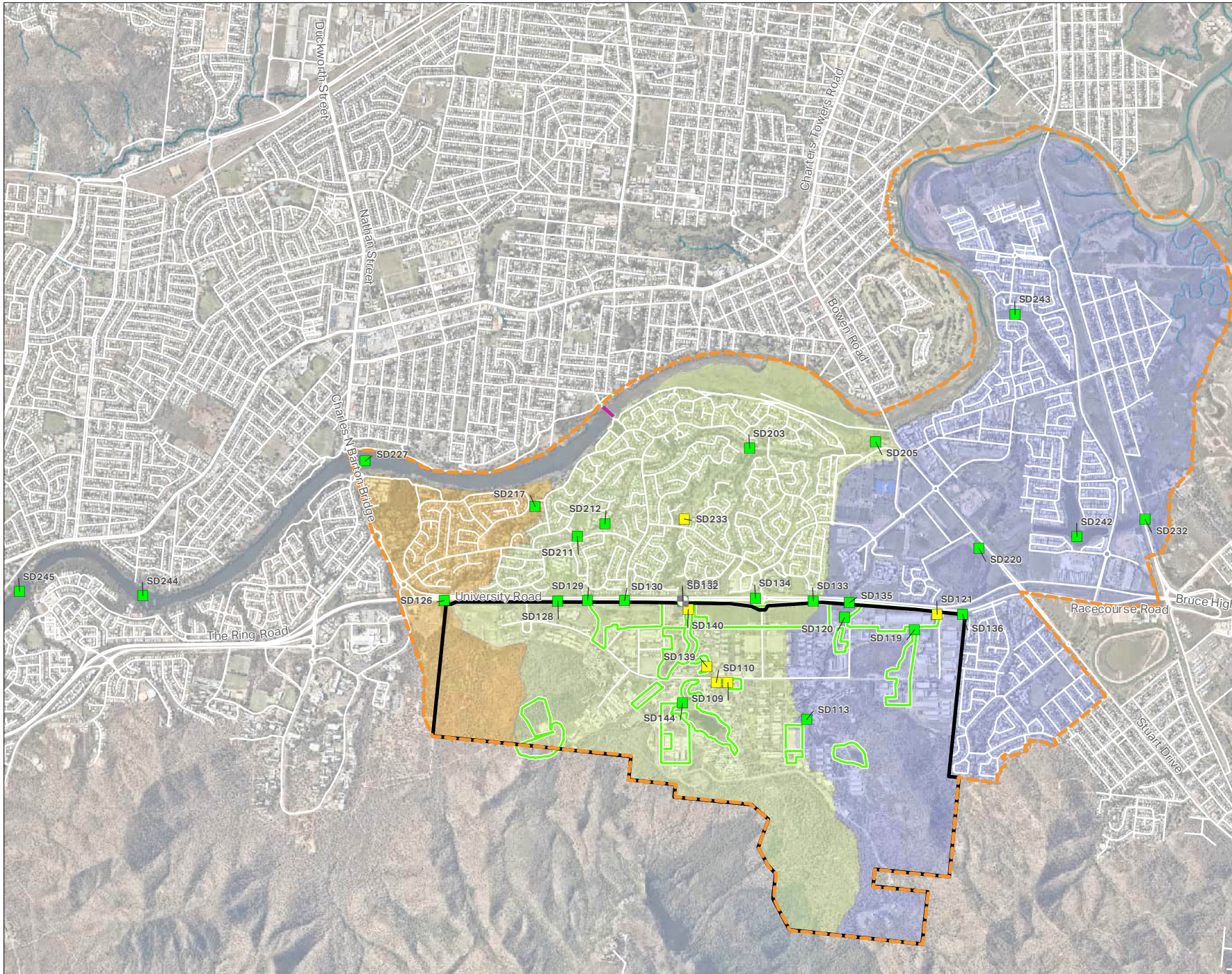
PROJECT NAME:
PFAS OMP
REPORT NAME:
Ongoing Monitoring Interpretive
Report (October 2020 - March 2023) -
Lavarack Barracks
CLIENT NAME:
Department of Defence
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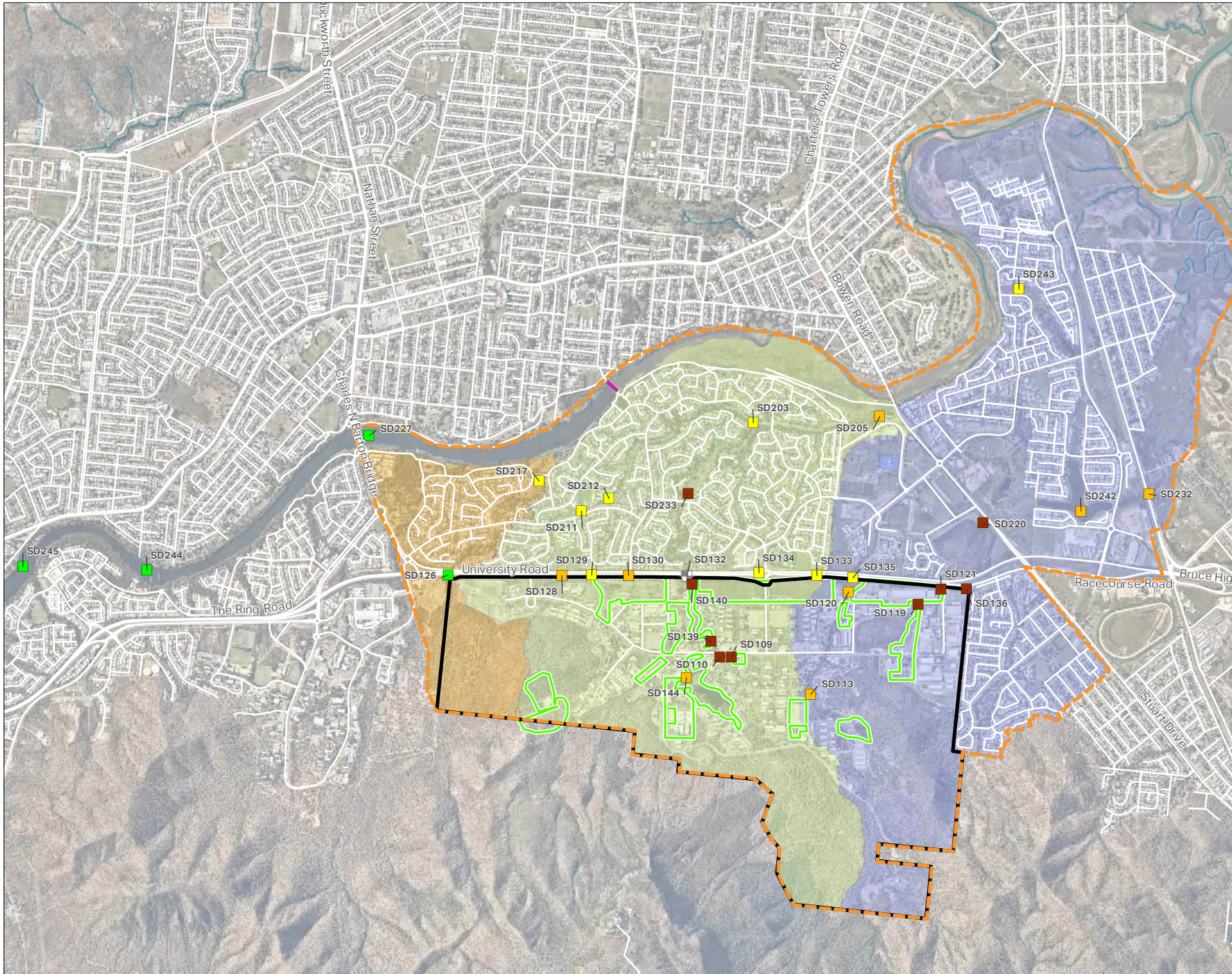
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Legend

- Base Boundary
- Management Area
- Aplin's Weir
- Source Areas
- Sub-catchments**
 - A and West
 - G and Central
 - J/K and East
- Concentrations of PFOS +PFHxS (mg/kg)**
 - > 1
 - > 0.01 - 1
 - > 0.001 - 0.01
 - > LOR - 0.001
 - < LOR
 - Location not sampled



**FIGURE F38:
SEDIMENT
CONCENTRATIONS OF
PFOS+PFHxS –
AUGUST 2021**

PROJECT NAME:
PFAS OMP
REPORT NAME:
Ongoing Monitoring Interpretive
Report (October 2020 - March 2023) -
Lavarack Barracks
CLIENT NAME:
Department of Defence
PROJECT NUMBER:
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Legend

- Base Boundary
- Management Area
- Aplin's Weir
- Source Areas
- Sub-catchments**
 - A and West
 - G and Central
 - J/K and East
- PFOA (mg/kg)**
 - > 1
 - > 0.01 - 1
 - > 0.001 - 0.01
 - > LOR - 0.001
 - < LOR
 - Location not sampled

**FIGURE F39:
SEDIMENT
CONCENTRATIONS OF
PFOA – AUGUST 2021**

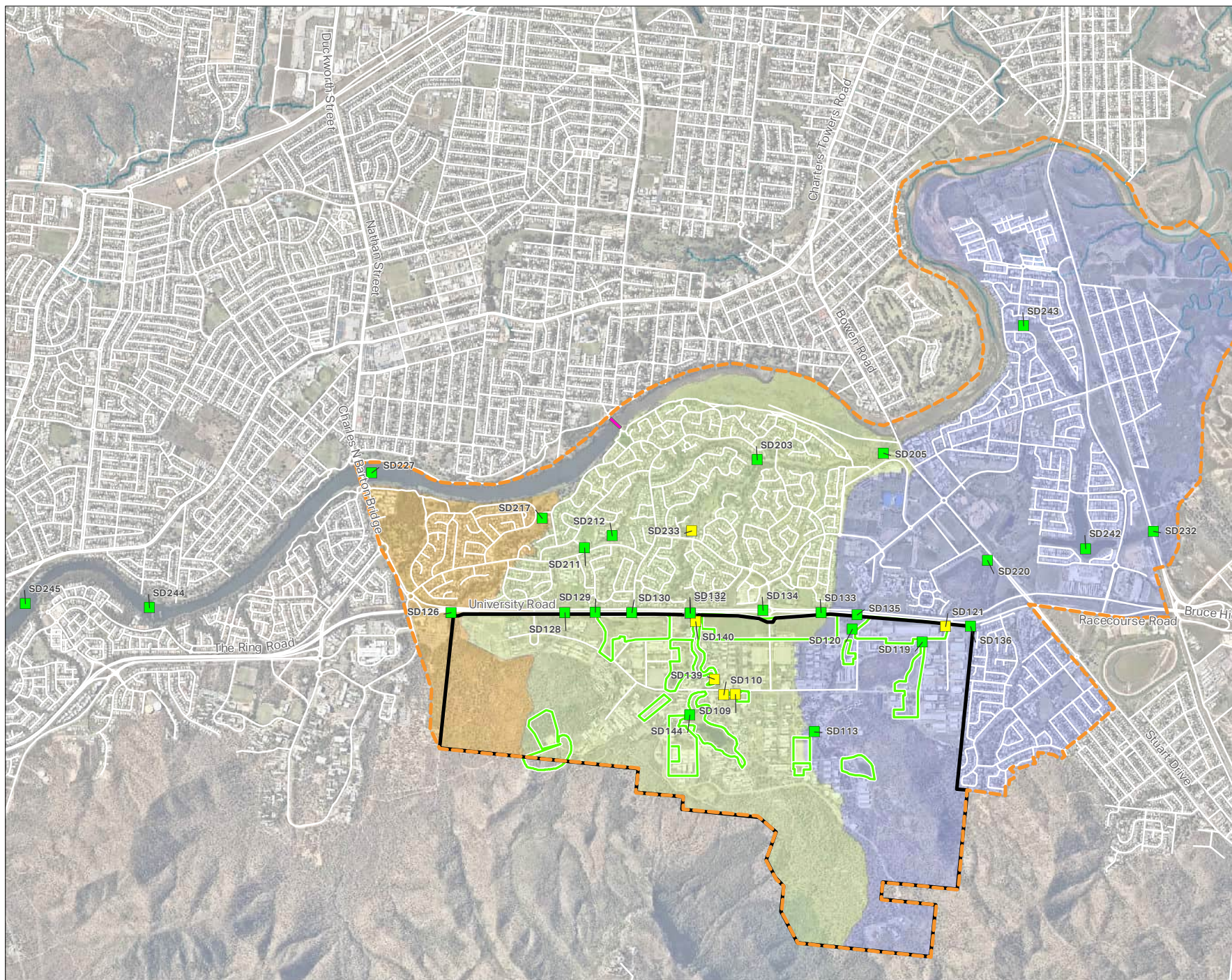
PROJECT NAME:
PFAS OMP
REPORT NAME:
Ongoing Monitoring Interpretive
Report (October 2020 - March 2023) -
Lavarack Barracks
CLIENT NAME:
Department of Defence
PROJECT NUMBER:
60612487

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Source:
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Legend

- Base Boundary
- Management Area
- Aplin's Weir
- Source Areas
- Sub-catchments**
- A and West
- G and Central
- J/K and East
- Watercourse

Concentrations of PFOS +PFHxS (mg/kg)

- > 1
- > 0.01 - 1
- > 0.001 - 0.01
- > LOR - 0.001
- < LOR

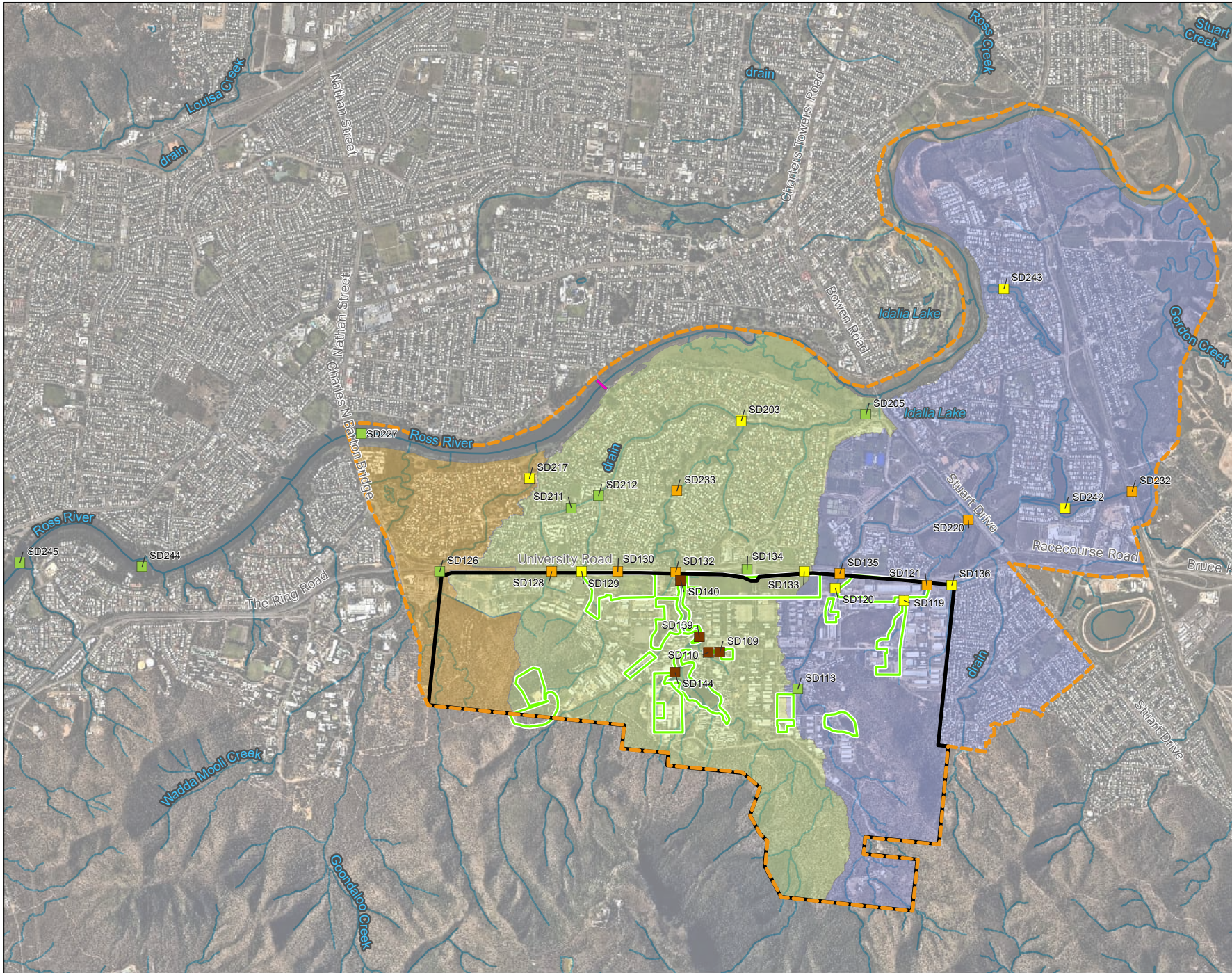
**FIGURE F40:
SEDIMENT
CONCENTRATIONS OF
PFOS+PFHxS –
FEBRUARY - APRIL 2022**

PROJECT NAME:
PFAS OMP
REPORT NAME:
Ongoing Monitoring Interpretive
Report (October 2020 - March 2023) -
Lavarack Barracks
CLIENT NAME:
Department of Defence
PROJECT NUMBER:
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Legend

- Base Boundary
- Management Area
- Aplin's Weir
- Source Areas
- Sub-catchments**
- A and West
- G and Central
- J/K and East
- Watercourse

Concentrations of PFOA (mg/kg)

- > 1
- > 0.01 - 1
- > 0.001 - 0.01
- > LOR - 0.001
- < LOR

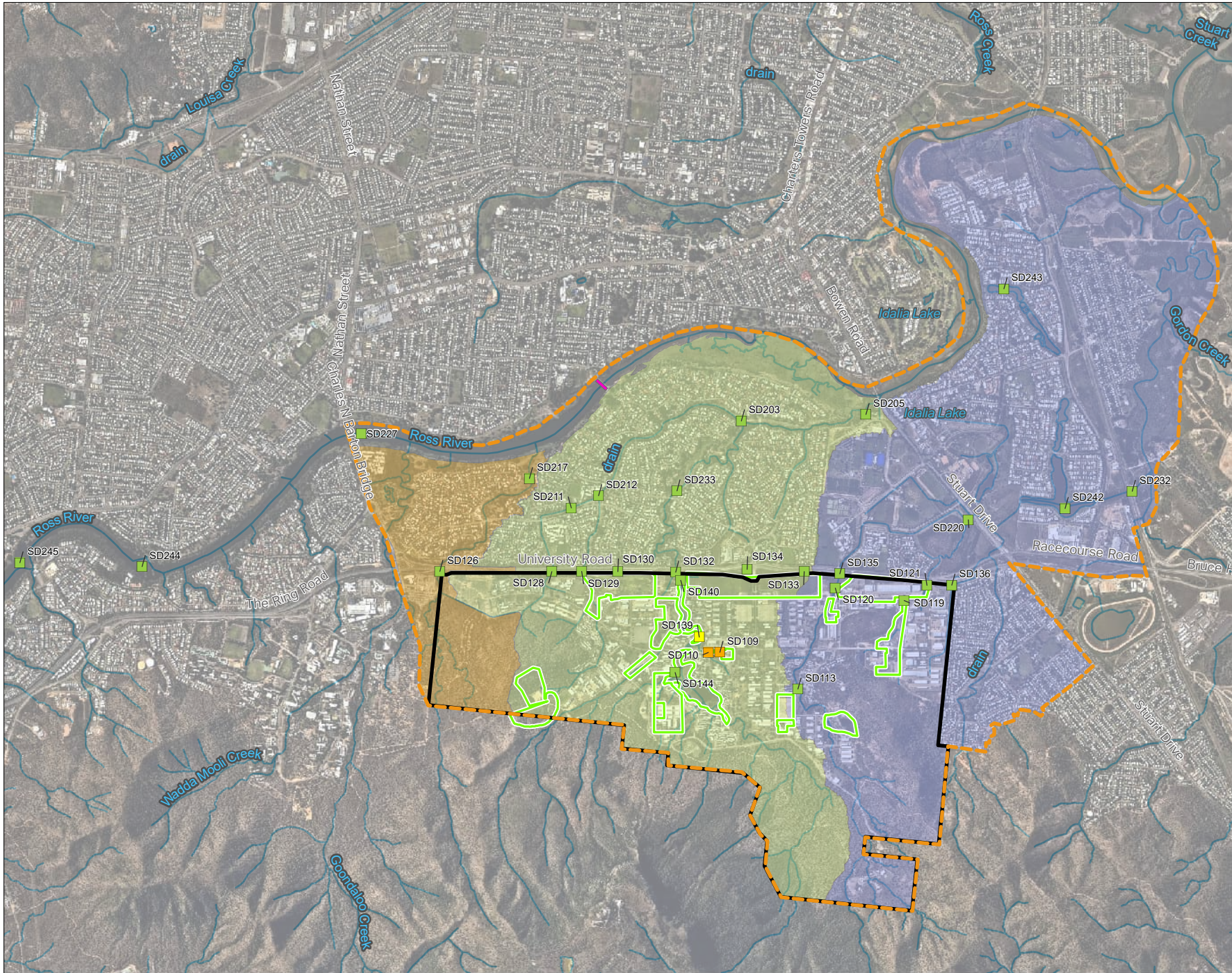
**FIGURE F41:
SEDIMENT
CONCENTRATIONS OF
PFOA –
FEBRUARY - APRIL 2022**

PROJECT NAME:
PFAS OMP
REPORT NAME:
Ongoing Monitoring Interpretive
Report (October 2020 - March 2023) -
Lavarack Barracks
CLIENT NAME:
Department of Defence
PROJECT NUMBER:
60612487

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Legend

- Base Boundary
- Management Area
- Aplin's Weir
- Source Areas
- Sub-catchments**
- A and West
- G and Central
- J/K and East
- Watercourse

Concentrations of PFOS + PFHxS (mg/kg)

- > 1
- > 0.01 - 1
- > 0.001 - 0.01
- > LOR - 0.001
- < LOR

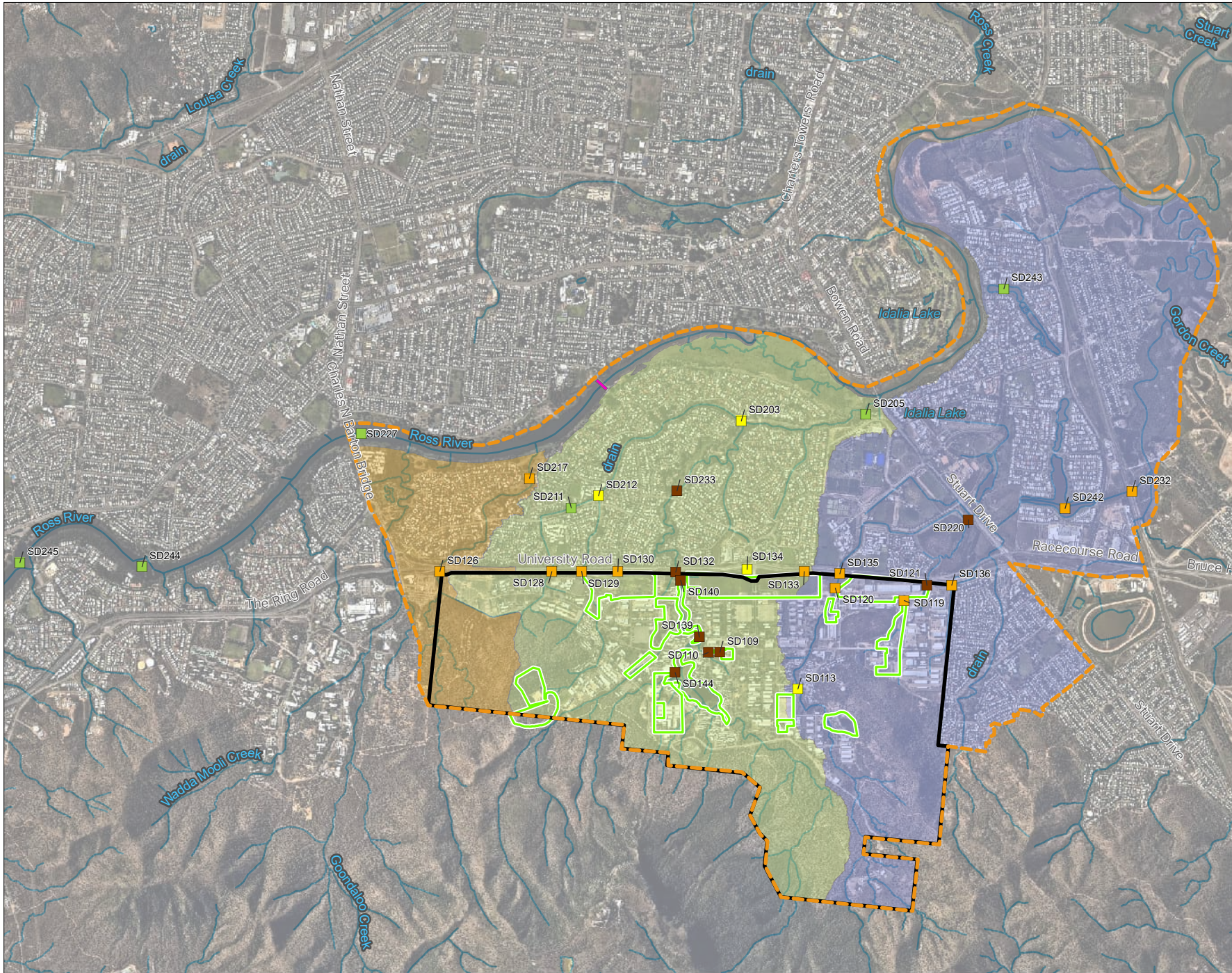
FIGURE F42:
SEDIMENT
CONCENTRATIONS OF
PFOS+PFHxS –
AUGUST - OCTOBER 2022

PROJECT NAME:
 PFAS OMP
REPORT NAME:
 Ongoing Monitoring Interpretive
 Report (October 2020 - March 2023) -
 Lavarack Barracks
CLIENT NAME:
 Department of Defence
PROJECT NUMBER:
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Legend

- Base Boundary
- Management Area
- Aplin's Weir
- Source Areas
- Sub-catchments**
 - A and West
 - G and Central
 - J/K and East
 - Watercourse

Concentrations of PFOA (mg/kg)

- > 1
- > 0.01 - 1
- > 0.001 - 0.01
- > LOR - 0.001
- < LOR

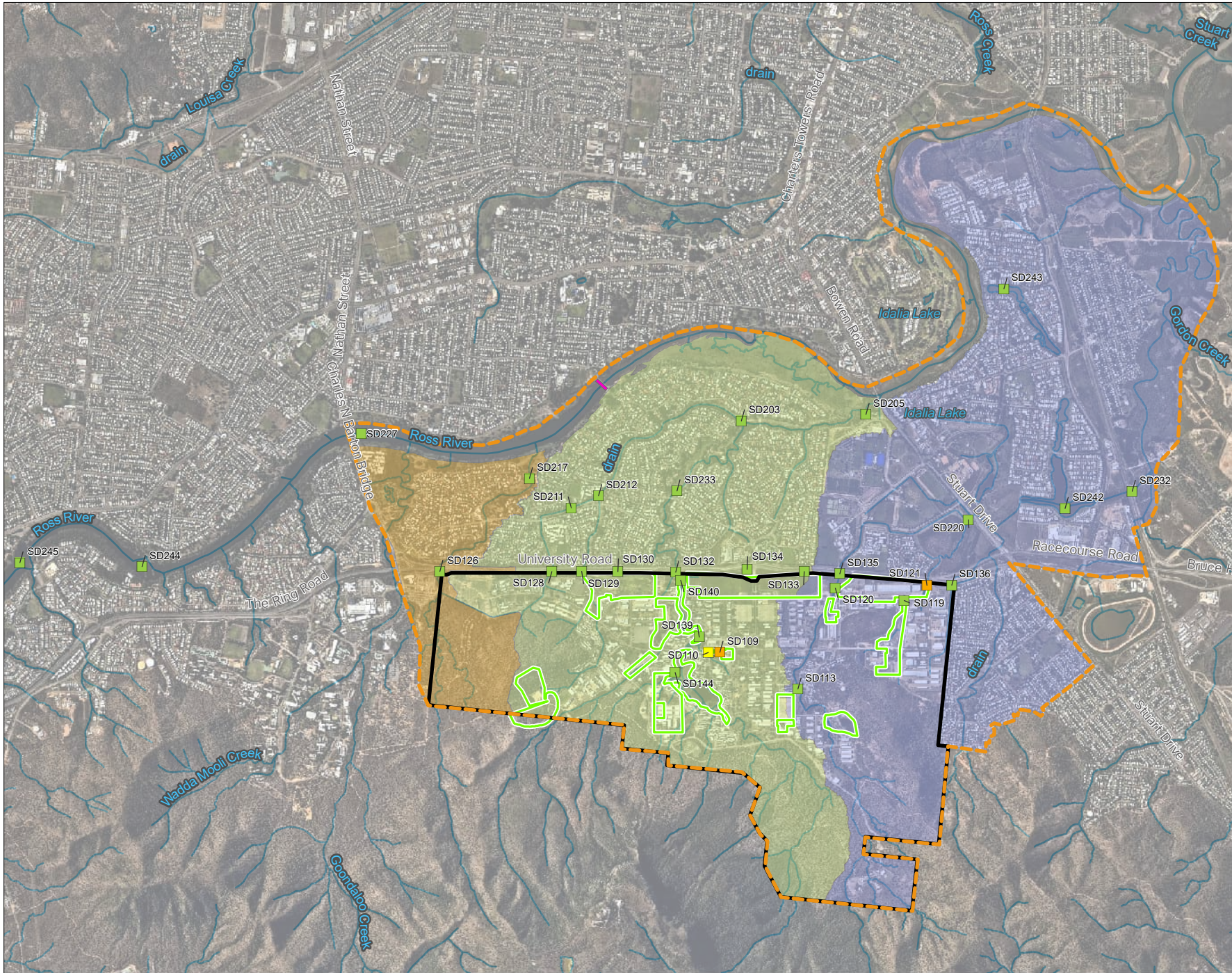
**FIGURE F43:
SEDIMENT
CONCENTRATIONS OF
PFOA –
AUGUST - OCTOBER 2022**

PROJECT NAME:
PFAS OMP
REPORT NAME:
Ongoing Monitoring Interpretive
Report (October 2020 - March 2023) -
Lavarack Barracks
CLIENT NAME:
Department of Defence
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Legend

- Base Boundary
- Management Area
- Aplin's Weir
- Source Areas
- Sub-catchments**
 - A and West
 - G and Central
 - J/K and East
 - Watercourse

Concentrations of PFOS +PFHxS (mg/kg)

- > 1
- > 0.01 - 1
- > 0.001 - 0.01
- > LOR - 0.001
- < LOR

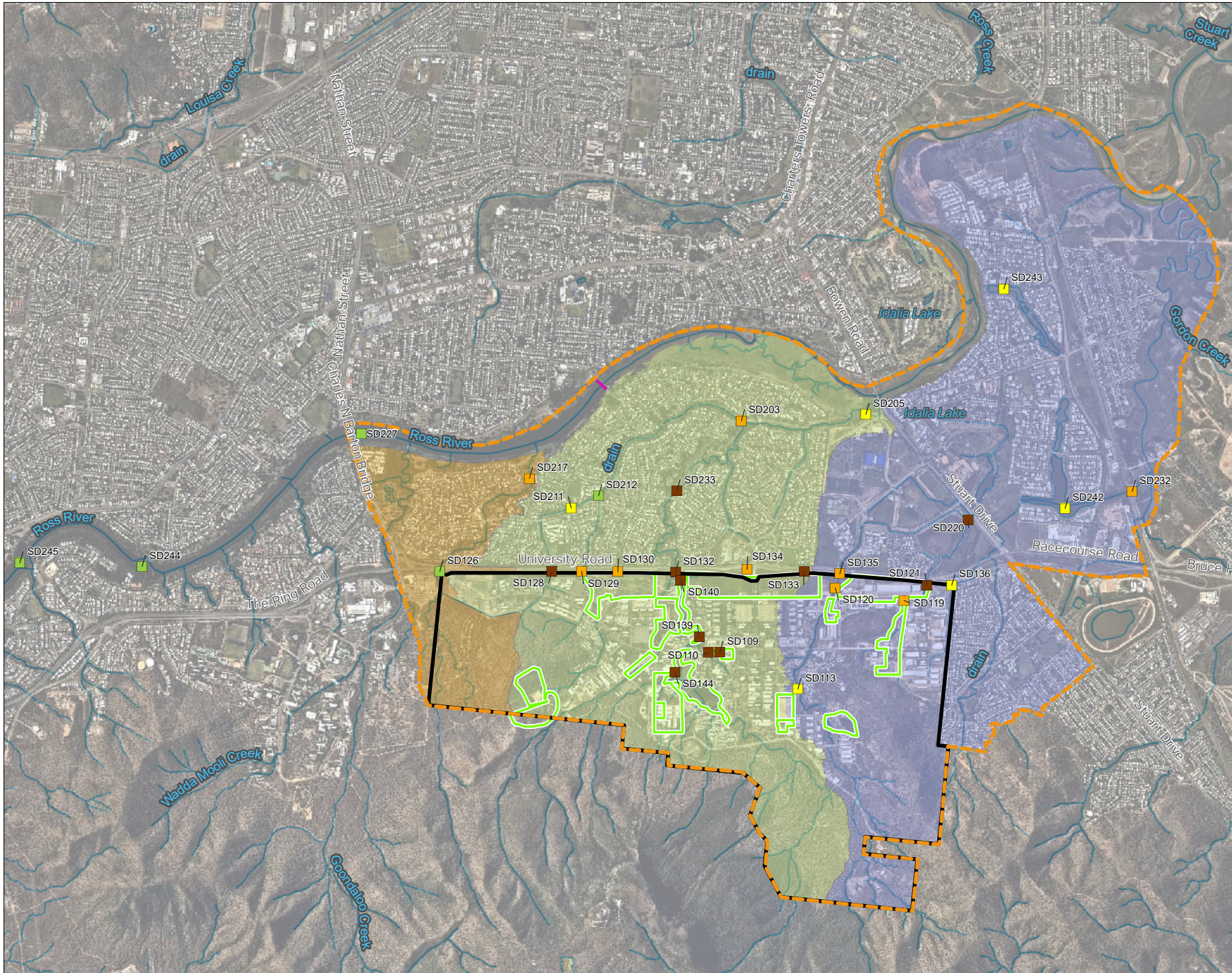
**FIGURE F44:
SEDIMENT
CONCENTRATIONS OF
PFOS+PFHxS –
MARCH 2023**

PROJECT NAME:
PFAS OMP
REPORT NAME:
Ongoing Monitoring Interpretive
Report (October 2020 - March 2023) -
Lavarack Barracks
CLIENT NAME:
Department of Defence
PROJECT NUMBER:
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Legend

- Base Boundary
- Management Area
- Aplin's Weir
- Source Areas
- Sub-catchments**
 - A and West
 - G and Central
 - J/K and East
 - Watercourse

Concentrations of PFOA (mg/kg)

- > 1
- > 0.01 - 1
- > 0.001 - 0.01
- > LOR - 0.001
- < LOR

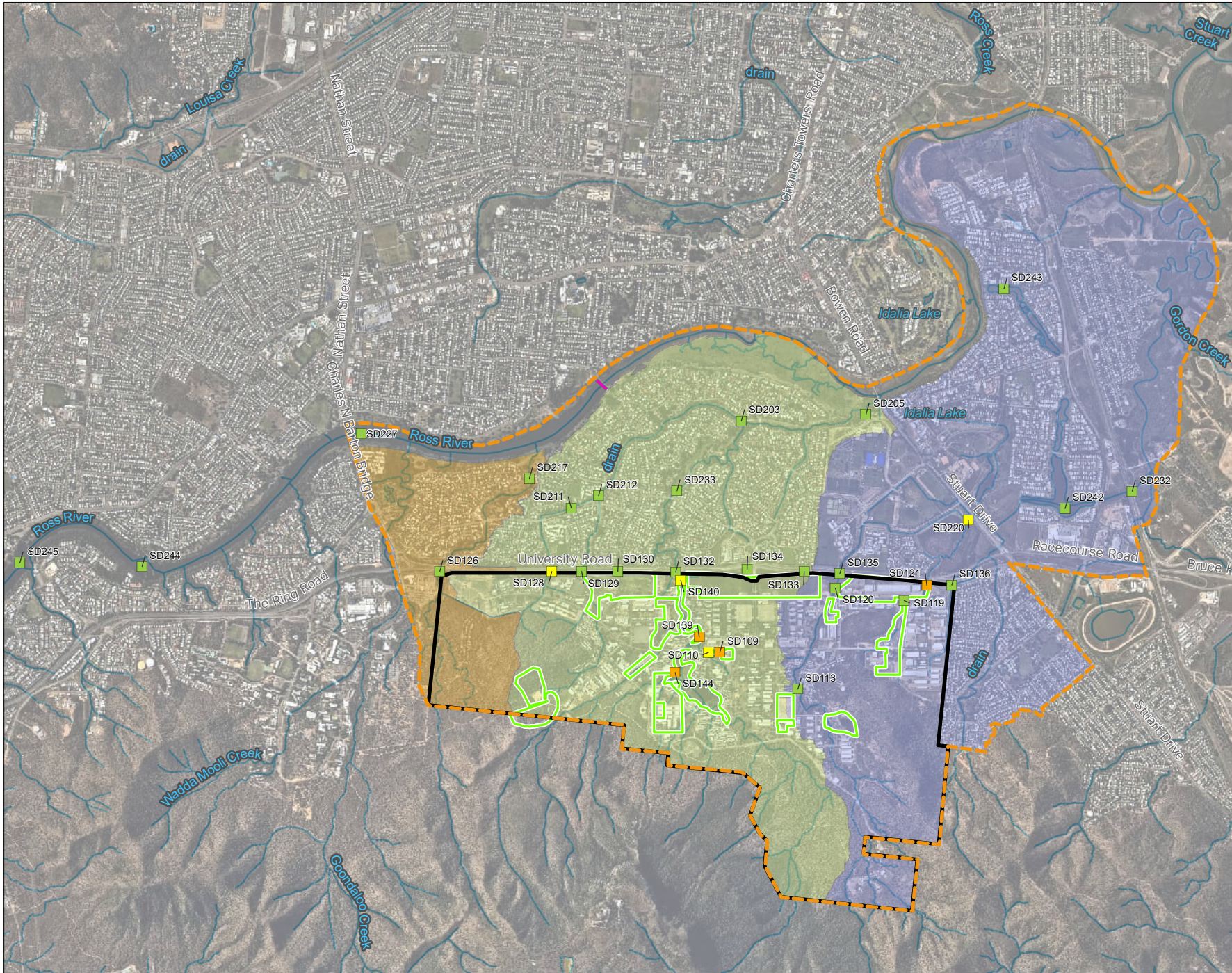
**FIGURE F45:
SEDIMENT
CONCENTRATIONS OF
PFOA –
MARCH 2023**

PROJECT NAME:
PFAS OMP
REPORT NAME:
Ongoing Monitoring Interpretive
Report (October 2020 - March 2023) -
Lavarack Barracks
CLIENT NAME:
Department of Defence
PROJECT NUMBER:
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Appendix B

Tables

Location ID	Source Area/Area of Interest	Sampled date	Standing Water Level (mbTOC)	Well depth (mbTOC)	Groundwater Elevation (mAHD)	DO (mg/L)	Temp (°C)	Corrected Redox (mV)	Electrical Conductivity (µS/cm)	pH
MW117D	Base Boundary	12/07/2019	1.490	19.800	4.460	0.36	24.8	96.1	7325	6.57
	Base Boundary	31/10/2008	#N/A	#N/A	#N/A	0.39	27.4	194.0	10950	7.09
	Base Boundary	28/10/2020	1.922	19.750	4.028	3.20	27.9	251.2	8431	6.79
	Base Boundary	30/03/2021	1.044	19.750	4.906	1.72	30.4	110.9	8695	6.68
	Base Boundary	17/08/2021	2.020	19.750	3.930	0.91	27.5	97.9	10934	6.72
	Base Boundary	14/02/2021	gauged due to constr	19.750	-	3.37	37.0	246.8	10987	7.10
	Base Boundary	24/08/2022								
Not gauged or sampled - Well destroyed										
MW117S	Base Boundary	12/07/2019	1.268	5.845	4.692	0.30	26.7	261.0	6880	7.65
	Base Boundary	5/12/2019	1.890	5.860	4.070	0.17	30.4	208.0	7740	7.46
	Base Boundary	28/10/2020	1.870	5.850	4.090	2.22	28.2	223.4	9351	7.61
	Base Boundary	30/03/2021	0.941	5.850	5.019	3.33	29.3	213.6	7942	7.48
	Base Boundary	17/08/2021	1.570	5.850	4.390	1.53	26.3	255.5	9655	7.71
	Base Boundary	3/03/2022								
Not gauged or sampled - Well destroyed										
MW118	Base Boundary	4/09/2018	2.194	6.000	8.346	0.30	28.7	307.0	3890	7.25
	Base Boundary	11/07/2019	1.822	6.065	8.718	0.20	28.3	295.0	4860	7.46
	Base Boundary	28/10/2020	2.078	6.020	8.462	2.56	27.8	248.0	6156	7.24
	Base Boundary	30/03/2021	1.334	6.020	9.206	2.17	29.6	279.0	3952	7.31
	Base Boundary	17/08/2021	1.884	6.020	8.656	0.44	27.4	281.5	6469	7.22
	Base Boundary	18/02/2022	1.927	6.020	-	2.64	30.4	315.9	5324	7.23
	Base Boundary	24/08/2022	1.765	6.020	8.775	0.69	25.9	243.6	5775	7.22
Base Boundary	9/03/2023	1.262	6.010	9.278	1.35	28.0	188.3	4984	7.54	
MW119	Base Boundary	3/09/2018	4.985	10.400	13.795	5.36	29.4	383.0	5550	6.89
	Base Boundary	11/07/2019	4.147	10.390	14.633	0.36	26.1	365.4	10066	6.44
	Base Boundary	5/12/2019	4.805	10.390	13.975	0.06	31.8	287.0	10480	6.66
	Base Boundary	28/10/2020	4.788	10.410	13.992	2.48	27.3	276.4	10420	6.46
	Base Boundary	30/03/2021	3.273	10.410	15.507	1.95	29.2	290.8	7823	6.74
	Base Boundary	17/08/2021	5.363	10.410	13.417	0.52	25.5	419.5	9385	6.81
	Base Boundary	18/02/2022	3.722	10.410	-	2.26	29.3	396.8	7090	6.75
	Base Boundary	24/08/2022	3.845	10.410	14.935	0.83	27.9	256.6	6376	7.12
Base Boundary	7/03/2023	2.472	10.410	16.308	2.31	28.3	269.2	4166	7.05	
MW220S	Off-Base	12/09/2018	2.423	5.985	1.327	3.50	28.2	388.0	-	6.39
	Off-Base	6/12/2019	2.830	4.500	0.920	0.12	29.1	195.0	11050	6.21
	Off-Base	3/11/2020	1.990	6.020	1.760	1.44	27.3	244.2	37387	5.76
	Off-Base	1/04/2021	1.624	6.020	2.126	2.52	26.2	220.8	35655	6.61
	Off-Base	18/08/2021	2.159	6.020	1.591	2.74	25.1	245.0	32869	6.53
	Off-Base	3/03/2022	1.773	6.020	1.977	0.56	29.1	328.9	45840	6.47
	Off-Base	24/08/2022	1.658	6.020	2.092	0.30	24.2	127.1	40290	6.43
	Off-Base	7/03/2023	1.425	6.020	2.325	2.33	29.6	183.4	34834	6.24
MW226	Off-Base	29/11/2017	0.000	7.000	-	3.01	31.1	410.0	11810	6.69
	Off-Base	4/12/2019	1.490	5.830	-	0.15	29.1	131.0	18220	6.51
	Off-Base	29/10/2020	1.358	5.850	-	1.97	26.2	224.8	17449	5.81
	Off-Base	30/03/2021	0.689	5.850	-	2.67	26.3	153.1	11043	6.41
	Off-Base	19/08/2021	1.179	5.850	-	0.72	22.3	408.9	13807	6.74
	Off-Base	3/03/2022	0.901	5.850	-	-	30.0	380.2	15201	5.88
	Off-Base	25/08/2022	1.020	5.850	-	0.91	21.5	335.2	17828	6.85
	Off-Base	8/03/2023	0.725	5.850	-	3.05	28.0	142.7	7032	6.73
MW232	Off-Base	12/09/2018	0.605	3.820	1.705	0.47	28.5	175.0	34400	6.64
	Off-Base	9/07/2019	0.565	3.828	1.745	0.15	24.7	175.0	50050	6.06
	Off-Base	6/12/2019	0.865	3.830	1.645	0.14	32.6	161.0	15720	6.25
	Off-Base	3/11/2020	0.565	3.030	1.745	1.53	29.1	225.7	51280	5.50
	Off-Base	31/03/2021	0.491	3.030	1.819	1.49	28.9	119.8	42007	6.47
	Off-Base	20/08/2021	0.600	3.030	1.710	3.25	25.6	121.1	37826	6.23
	Off-Base	3/03/2022	0.561	3.030	1.749	0.36	30.8	343.2	51132	6.39
	Off-Base	24/08/2022	0.465	3.030	1.845	0.69	24.5	172.0	42048	6.63
Off-Base	9/03/2023	0.270	3.030	2.040	1.53	28.2	141.3	35058	6.65	

Notes
- No Data
m BTOC - metres below top of casing
m AHD - metres relative to Australian Height Datum
DO - dissolved Oxygen
mg/L - milligrams per litre
°C - degrees celsius
mV - millivolts
µS/cm - microsiemens per centimetre

Table T2: Groundwater Analytical Results

Table with columns for chemical species (PFOS, PFHxS, PFOA, 4:2 FTS, 6:2 FTS, 8:2 FTS, 10:2 FTS, E1FOSA, E1FOSAA, E1FOSE, FOSA, MeFOSA, M1FOSAA, MeFOSE, PFBS, PPFes, PFHpS, PFDS, PFBA, PFHxA, PPFes, PFHpA, PFDA, PFDoDA, PFNA, PFTeDA, PFTtDA, PFUnDA, Sum of PFOS and PFHxS, Sum of PFAS) and rows for various monitoring wells (MW117D, MW117S, MW118, MW119, Off-Base, MW220S, MW226, MW232) across multiple sample dates from 2018 to 2023.

Notes
µg/L - micrograms per litre
LOR - Limit of Reporting
NEMP is National Environmental Management Plan
< symbol denotes concentration is less than LOR
* Only groundwater samples collected from the Off-Base Management Area have been compared to NEMP (2020) Drinking Water Criteria.
Denotes disturbance to the well may have impacted sample integrity

Location ID	Source Area/Area of Interest	Sampled date	DO (mg/L)	Temp (°C)	Corrected Redox (mV)	Electrical Conductivity (µS/cm)	pH	Observations
SW211	Off-Base	2/11/2020	13.35	33.3	250.0	14005	8.05	Yellow, No odour, No sheen
	Off-Base	1/04/2021	5.67	25.5	289.3	7077	7.35	Medium turbidity, Pale Yellow, No odour, No sheen, Rock drain. Water not Flowing.
	Off-Base	19/08/2021	9.13	23.5	315.6	6585	7.63	Medium turbidity, Yellowish Brown, No odour, Biosheen Appearance, Rock drain. Slowly flowing.
	Off-Base	19/08/2021	9.13	23.5	315.6	6585	7.63	Medium turbidity, Yellowish Brown, No odour, Biosheen Appearance, Rock drain. Slowly flowing.
	Off-Base	2/03/2022	0.92	29.8	363.2	13071	7.15	Low turbidity, Pale yellow, No odour, No sheen, Rock drain. Slowly flowing.
	Off-Base	22/08/2022	2.24	16.2	264.1	8717	7.18	Low turbidity, Clear, No odour, No sheen, Drainage gully, some freshly cut grass in water. No flow.
Off-Base	9/03/2023	4.61	29.7	203.0	1067	7.53	Low turbidity, Light Brown, No odour, No sheen, Drainage creek, 1m wide, 0.1m deep, no flow observed.	
SW212	Off-Base	2/11/2020	9.71	29.3	219.1	12684	8.63	Pale yellow, No odour, No sheen
	Off-Base	1/04/2021	4.62	24.3	284.5	8350	7.54	Medium turbidity, Pale Yellow, No odour, No sheen, Concrete drain. Water not Flowing.
	Off-Base	19/08/2021	8.90	25.4	256.1	7163	8.58	Low turbidity, Yellow, Weak sulphurous odour, No sheen, Concrete drain. Not flowing.
	Off-Base	19/08/2021	8.90	25.4	256.1	7163	8.58	Low turbidity, Yellow, Weak sulphurous odour, No sheen, Concrete drain. Not flowing.
	Off-Base	2/03/2022	2.72	28.7	375.0	13609	6.67	Low turbidity, Pale yellow, No odour, No sheen, Concrete drain. Not flowing.
	Off-Base	22/08/2022	8.29	15.1	265.9	14992	8.10	Low turbidity, Clear, No odour, No sheen, Large culvert, minimal water, slightly flowing.
Off-Base	9/03/2023	9.35	29.1	221.8	1244	8.76	Low turbidity, Light Yellow, No odour, No sheen, concrete drain, low flow, 4m, 0.05m deep.	
SW233	Off-Base	2/11/2020	2.58	28.5	194.8	1412	7.20	Dark Reddish Brown, No odour, No sheen
	Off-Base	29/03/2021	2.83	27.2	283.0	957	7.43	Medium turbidity, Pale Yellow, Slight Organic Odour, No sheen, Creek. Water not Flowing.
	Off-Base	16/08/2021	5.61	21.9	334.4	1721	7.78	Low turbidity, Light Olive Brown, No odour, No sheen, Creek.
	Off-Base	16/08/2021	5.61	21.9	334.4	1721	7.78	Low turbidity, Light Olive Brown, No odour, No sheen, Creek.
	Off-Base	2/03/2022	3.60	31.3	281.5	1348	7.50	Low turbidity, Pale yellow, No odour, No sheen, Creek, no flow.
	Off-Base	22/08/2022	6.01	22.5	276.1	218.1	7.50	Low turbidity, Clear, No odour, No sheen, Shallow creek. Some reeds in sample location. No flow.
Off-Base	6/03/2023	3.89	27.8	317.7	695	7.16	Low turbidity, Light Olive/Brown, No odour, No sheen, Creek, 5m wide, 0.7m deep, low flow observed.	
J/K and East Sub-Catchment								
SW119	Eastern PFAS Contamination Area	29/10/2020	8.30	35.7	199.3	328	6.87	Yellowish Brown, Organic Odour, No sheen
	Eastern PFAS Contamination Area	29/03/2021	9.79	30.3	303.5	1422	8.77	Low turbidity, Pale Yellow, Slight Organic Odour, No sheen, Concrete drain. Water Flowing slowly.
	Eastern PFAS Contamination Area	18/08/2021	12.31	24.3	240.4	10548	9.15	Medium turbidity, Yellow, Slight Organic Odour, No sheen, Concrete drain., High level of floating organics (algae) in sample
	Eastern PFAS Contamination Area	22/04/2022	8.06	25	243.1	594	7.71	Low turbidity, Pale yellow, No odour, No sheen, Concrete drain. Not flowing. Not enough water present for parameter readings on sample day, parameters collected during subsequent round.
	Eastern PFAS Contamination Area	10/03/2023	7.23	32.6	370.0	714	7.23	Low turbidity, Clear, No odour, No sheen.
SW121	Eastern PFAS Contamination Area	29/03/2021	3.49	27.5	207.5	1621	7.07	Medium turbidity, Pale Yellow, Organic Odour, No sheen, Concrete drain. Water Flowing slowly.
	Eastern PFAS Contamination Area	15/08/2021	0.31	24.1	300.3	5721	7.81	Clear, Very Dark Bluish Grey, No odour, No sheen, Concrete drain., Sample taken downstream of culvert, upstream on base had no water.
	Eastern PFAS Contamination Area	1/03/2022	3.89	31.6	181.9	2609	7.26	Low turbidity, Yellowish red, No odour, Biosheen appearance. Concrete drain. Water not flowing. Sample taken downstream of culvert, upstream on Base had no water.
	Eastern PFAS Contamination Area	22/08/2022	4.17	23.8	145.5	4076	7.05	Low turbidity, Clear, No odour, Slight sheen, Pale orange algae present. Water slightly flowing.
Eastern PFAS Contamination Area	6/03/2023	No water available for sampling due to thick vegetation.						
SW113	On-Base	28/10/2020	2.44	32.1	217.9	377.5	7.14	Red, Organic Odour, No sheen
	On-Base	29/03/2021	7.31	28.8	322.2	324.2	7.28	Clear, Other, No odour, No sheen, Creek. Water Flowing.
	On-Base	1/03/2022	5.98	31.9	319.1	351	7.20	Low turbidity, Pale yellow, No odour, No sheen, Creek, no flow.
	On-Base	22/08/2022	11.97	23.3	291.5	405.3	8.24	Low turbidity, Clear, No odour, No sheen, Some surface algae present. No flow.
	On-Base	10/03/2023	7.79	31.9	278.4	417.3	7.74	Low turbidity, Clear, No odour, No sheen.
SW120	On-Base	29/03/2021	9.22	31.1	284.4	443.2	8.37	Low turbidity, Pale Yellow, No odour, No sheen, Ephemeral creek. Water Flowing slowly.
	On-Base	22/04/2022	7.07	24.9	275.0	155.7	7.51	Low turbidity, Pale yellow, No odour, No sheen, Creek, no flow.No water (dry creek bed) during initial round.
	On-Base	10/03/2023	Location was dry					
SW135	Base Boundary	28/10/2020	2.52	30.5	248.0	629	7.29	Yellowish Red, Slight Organic Odour, No sheen
	Base Boundary	29/03/2021	11.68	29.1	283.2	817	7.19	Medium turbidity, Pale Yellow, No odour, No sheen, Concrete drain. Water Flowing slowly.
	Base Boundary	22/06/2021	11.81	23.1	574.5	512	7.12	Low turbidity, Pale Yellow, No odour, No sheen, Concrete drain. Water not Flowing.
	Base Boundary	18/08/2021	6.18	23.7	258.6	623	7.86	Clear, Yellowish Red, Slight Organic Odour, Biosheen Appearance, Concrete drain, Algae in sample.
	Base Boundary	1/03/2022	6.00	33	350.4	559	7.22	Low turbidity, Pale yellow, No odour, No sheen, Concrete drain, no flow.Algae in sample.
	Base Boundary	22/08/2022	7.70	23.2	271.6	634	7.83	Low turbidity, Clear, No odour, No sheen, Sample from drainage culvert, refuse comprising empty bottles was present at this location. Low flow.
SW136	Base Boundary	6/03/2023	2.40	29	268.3	2660	8.88	Low turbidity, Clear, No odour, No sheen, Drainage channel, minimal flow, 4m wide, 5cm deep.
	Base Boundary	26/03/2021	10.98	36	263.5	803	9.17	Low turbidity, Pale Yellow, Organic Odour, No sheen, Concrete drain. Water not Flowing.
SW220	Off-Base	6/03/2023	4.45	28.5	335.8	925	8.20	Low turbidity, Clear, No odour, No sheen, Drainage course, medium flow rate, 5cm deep, 0.5m wide.
	Off-Base	2/11/2020	4.19	30.9	195.0	1917	7.15	Light Olive Brown, Septic, No sheen
	Off-Base	1/04/2021	3.63	23.7	198.2	2148	7.26	Clear, Other, No odour, No sheen, Earthen drain. Water not Flowing.
	Off-Base	16/08/2021	6.89	22.6	310.6	3620	8.24	Low turbidity, Yellowish Red, No odour, No sheen, Earthen drain, Not flowing, Water was present under the road culvert. This was sampled
	Off-Base	2/03/2022	7.18	34.9	322.7	2005	7.47	Medium turbidity, Pale yellow, No odour, No sheen, Earthen drain. Not flowing.Water was present under the road culvert. This was sampled
	Off-Base	22/08/2022	12.66	26	269.4	3665	8.58	Clear, Pale yellow, No odour, No sheen, Adjacent to culvert.
SW232	Off-Base	9/03/2023	2.14	26.7	393.3	648	6.42	Low turbidity, Brown, No odour, No sheen, Drainage channel, 2m wide, 0.3m deep, slow flow.
	Off-Base	2/11/2020	7.62	29.9	222.1	262.8	7.64	Black, Putrefied, Biosheen Appearance
	Off-Base	29/03/2021	2.72	27.4	381.2	16436	6.87	Medium turbidity, Dark Olive Brown, Seawater Odour, No sheen, Creek. Water not Flowing.
	Off-Base	16/08/2021	6.43	23.9	371.2	46629	6.42	Medium turbidity, Light Olive Brown, No odour, No sheen.
	Off-Base	2/03/2022	11.71	37.3	275.8	29508	8.61	Medium turbidity, Pale yellow, No odour, No sheen, Creek, no flow.
	Off-Base	22/08/2022	4.38	26.1	281.7	33869	7.76	Low turbidity, Pale yellow, No odour, No sheen, Earthen drain adjacent road culvert. Slow flowing.
SW242	Off-Base	9/03/2023	2.75	28.9	247.6	4083	8.16	Medium turbidity, Light Brown, No odour, Biosheen, Creek, 3m wide, 1m deep, slow flow observed.
	Off-Base	2/11/2020	5.82	29.9	226.1	64101	7.65	Light Olive Brown, No odour, No sheen
	Off-Base	29/03/2021	5.34	28.7	339.8	19470	7.65	Medium turbidity, Light Olive Brown, Slight Organic Odour, No sheen, Lake. Water not Flowing.
	Off-Base	15/08/2021	7.03	23.9	372.3	47034	7.86	Clear, No odour, No sheen, Lake. Water not flowing.
	Off-Base	2/03/2022	-	35.4	285.1	28552	8.49	Low turbidity, Other odour, No sheen, Lake. Water not flowing.
	Off-Base	22/08/2022	5.62	25.3	283.9	35095	8.12	Clear, Pale yellow, No odour, No sheen, Man made lake, sample collected 30 cm out from bank. No flow.
SW243	Off-Base	9/03/2023	3.74	28.1	308.9	1674	8.20	Medium turbidity, Light Brown, No odour, No sheen, Lake, 200m wide, 50m wide, no flow observed.
	Off-Base	2/11/2020	6.40	31.1	229.1	63560	7.64	Light Olive Brown, No odour, No sheen.
	Off-Base	29/03/2021	6.25	28.9	346.4	38099	7.51	Medium turbidity, Pale Yellow, No odour, No sheen, Lake. Water not Flowing.
	Off-Base	15/08/2021	7.60	24.6	416.1	48932	7.67	Low turbidity, Light Olive Brown, No odour, No sheen, Lake. Water not flowing.
	Off-Base	2/03/2022	6.84	34.6	290.2	49925	7.86	Low turbidity, Light olive brown, No odour, No sheen, Lake. Water not flowing.
	Off-Base	22/08/2022	6.22	26.8	304.4	43042	8.03	Medium turbidity, Yellowish brown, No odour, No sheen, Idalia Lake, approximately 20 cm deep at sample point. No flow.
Off-Base	9/03/2023	3.55	29.2	210.0	10695	7.98	Low turbidity, Light Yellow, No odour, No sheen.	

Location ID	Source Area/Area of Interest	Sampled date	DO (mg/L)	Temp (°C)	Corrected Redox (mV)	Electrical Conductivity (µS/cm)	pH	Observations
Ross River								
SW227	Off-Base	3/11/2020	8.93	347.5	206.1	347.6	8.41	Light Olive Brown, No odour, No sheen.
	Off-Base	26/03/2021	6.59	31.7	306.4	275.4	-	Low turbidity, Light Olive Brown, No odour, No sheen, Ross River. Immediately downstream of weir. Water not Flowing.
	Off-Base	18/08/2021	5.19	24.5	256.5	336.2	8.07	Clear, Yellow, No odour, No sheen, Ross River. Immediately downstream of weir. Water not flowing.
	Off-Base	1/03/2022	9.25	35.4	314.2	254.4	8.91	Clear, Dark reddish brown, No odour, No sheen, Ross River, immediately downstream of weir. Water not flowing.
	Off-Base	22/08/2022	5.63	20.5	254.1	257.1	7.22	Low turbidity, Clear, No odour, No sheen, Middle of river sample. No flow.
	Off-Base	8/03/2023	5.00	30.3	287.1	169.5	7.86	Clear, slow flow under bridge.
SW244	Off-Base	3/11/2020	7.57	30.2	208.2	493.9	7.93	Light Olive Brown, No odour, No sheen
	Off-Base	26/03/2021	5.73	30.1	315.9	211.4	7.20	Low turbidity, Light Olive Brown, No odour, No sheen, Ross River. Downstream of Nathan St bridge. Water not Flowing.
	Off-Base	18/08/2021	6.86	23.7	263.3	298.6	7.72	Clear, Yellowish Red, No odour, No sheen, Ross River. Downstream of Nathan St bridge. Water not flowing.
	Off-Base	28/02/2022	7.61	35.6	354.3	246.4	8.05	Clear, Reddish yellow, No odour, No sheen, Ross River, downstream of Nathan St bridge. Water not flowing.
	Off-Base	22/08/2022	4.99	26.9	235.7	209.5	7.55	Low turbidity, Clear, No odour, No sheen, Middle of river, above weir. No flow.
	Off-Base	8/03/2023	4.49	30.3	226.9	150.4	7.60	Low turbidity, Clear, No odour, No sheen, Slow flow just above weir.
SW245	Off-Base	3/11/2020	7.30	31.8	207.9	297.5	7.58	Light Olive Brown, No odour, No sheen
	Off-Base	26/03/2021	5.60	29.1	346.5	173.4	7.06	Low turbidity, Light Olive Brown, No odour, No sheen, Ross River. Immediately upstream of weir. Water not Flowing.
	Off-Base	17/08/2021	4.38	21.3	280.8	282.9	7.45	Clear, Reddish Yellow, No odour, No sheen, Ross River. Immediately upstream of weir. Water not flowing
	Off-Base	27/02/2022	6.98	30.5	382.8	156.3	7.40	Clear, Dark reddish brown, No odour, No sheen, Ross River, immediately upstream of weir. Water not flowing.
	Off-Base	22/08/2022	5.00	23.9	260.0	190.5	7.30	Low turbidity, Clear, No odour, No sheen, Middle of river, above weir. No flow.
	Off-Base	8/03/2023	5.10	29.3	363.3	185.9	7.18	Low turbidity, Brown, No odour, No sheen, Slow flow just above weir.

Notes
DO - dissolved Oxygen
mg/L - milligrams per litre
°C - degrees celsius
mV - millivolts
µS/cm - microsiemens per centimetre

Table T4: Surface Water Analytical Results

Summary table with columns for PFOS, PFHxS, PFOA, 4:2 FTS, 6:2 FIS, 8:2 FTS, 10:2 FTS, E1FOSA, E1FOSAA, E1FOSE, FOSA, MeFOSA, MFOSAA, MeFOSE, PFBS, PFPeS, PFHpS, PFDS, PFBA, PFHxA, PFPeA, PFHpA, PFDA, PFDoA, PFNA, PFTeDA, PFTDA, PFUnDA, Sum of PFOS and PFHxS, Sum of PFAS. Includes rows for NEMP (2020) Drinking Water Criteria, NEMP (2020) Recreational Use Criteria, and NEMP (2020) Fresh and Marine (95% species prot).

Location Sample Date

A and West Sub-Catchment

Table for A and West Sub-Catchment, Base Boundary, SW126, with columns for various PFAS analytes and dates from 10/12/2018 to 8/03/2023.

Table for A and West Sub-Catchment, Off-Base, SW217, with columns for various PFAS analytes and dates from 17/12/2018 to 6/03/2023.

G and Central Sub-Catchment

Former Fire Station

Table for G and Central Sub-Catchment, Former Fire Station, SW109 and SW110, with columns for various PFAS analytes and dates from 16/12/2018 to 15/03/2023.

Lavarack Golf Course and Sporting Fields

Table for Lavarack Golf Course and Sporting Fields, SW129 and SW130, with columns for various PFAS analytes and dates from 10/12/2018 to 8/03/2023.

Top, Middle and Lower Dams

Table for Top, Middle and Lower Dams, SW139 and SW140, with columns for various PFAS analytes and dates from 2/10/2018 to 6/03/2023.

Table T4: Surface Water Analytical Results

Summary table with columns for chemical parameters (PFOS, PFHxS, PFOA, 4:2 FTS, 6:2 FIS, 8:2 FTS, 10:2 FTS, E1FOSA, E1FOSAA, E1FOSE, FOSA, MeFOSA, M1FOSAA, MeFOSE, PFBS, PFPeS, PFHpS, PFDS, PFBA, PFHXA, PFPeA, PFHpA, PFDA, PFDoDA, PFNA, PFTeDA, PFTrDA, PFUnDA) and rows for NEMP (2020) Drinking Water Criteria, NEMP (2020) Recreational Use Criteria, and NEMP (2020) Fresh and Marine (95% species prot).

Main data table with columns for Location (SW144, Base Boundary, SW128, SW132, SW133, SW134, Off-Base, SW203, SW205, SW211, SW212) and Sample Date (various dates from 2018 to 2023). It contains the same 28 chemical parameters as the summary table.

Table T4: Surface Water Analytical Results

Table with columns for Units, LOR, and various PFAS compounds (PFOS, PFHxS, PFOA, 4:2 FTS, 6:2 FIS, 8:2 FTS, 10:2 FTS, E1FO5A, E1FO5AA, E1FO5E, FOSA, MeFO5A, MFO5AA, MeFO5E, PFBS, PPFes, PFHpS, PFDS, PFBA, PFHxA, PPFPeA, PFHpA, PFDA, PFDoDA, PFNA, PFTeDA, PFTrDA, PFUnDA, Sum of PFOS and PFHxS, Sum of PFAS). Rows include NEMP (2020) criteria and sample data for locations SW232, SW242, SW243, Ross River Off-Base, SW227, SW244, and SW245.

Notes
LOR limit of reporting
µg/L micrograms per litre
< denotes concentration is less than
1. Only surface water results from SW245 have been compared to NEMP (2020) drinking water criteria. This is the only surface water location within the emergency drinking water supply for Townsville and is upgradient of Blacks Weir and not tidally influenced.
NEMP is National Environmental Management Plan

Location ID	Source Area / Area of Interest	Sampled Date	Sample Comments
A and West sub-Catchment			
SD126	Base Boundary	29/10/2020	CLAY, medium plasticity, brown with pale grey mottled, moist, firm. organic components - roots
	Base Boundary	26/03/2021	Sandy CLAY. Medium plasticity, grey, with organic material.
	Base Boundary	18/08/2021	Silty gravelly SAND. Fine to medium grain, sub-angular, loose, dry.
	Base Boundary	2/03/2022	Gravelly SAND, brown/red, poorly graded, moist, low organic content. No odour.
	Base Boundary	23/08/2022	SAND, light brown, medium grained, loose. No odour. Nil
	Base Boundary	8/03/2023	SAND, yellow, medium grained, poorly graded, with trace subangular gravel, wet. No odour.
SD217	Off-Base	2/11/2020	silty CLAY, low plasticity, dark grey, saturated, firm.
	Off-Base	29/03/2021	Sandy SILT. Fine sands, dark grey, firm, saturated, with organic materials
	Off-Base	19/08/2021	Silty SAND. Sub-angular, red brown, saturated.
	Off-Base	2/03/2022	CLAY, dark brown, medium plasticity, high organic content (biota, roots and leaves). No odour.
	Off-Base	22/08/2022	sandy CLAY, firm, medium plasticity, wet, dark brown to black, fine grained sand. No odour. Organic content (roots and leaves)
	Off-Base	8/03/2023	sandy CLAY, firm, dark brown to black, fine grained sand, wet. Organic content (roots and leaves). No odour.
SD227	Off-Base	3/11/2020	SAND, fine, well graded, dark grey, saturate. some organics
	Off-Base	26/03/2021	Silty SAND. Fine, loose, dark grey with black organic inclusions, saturated, with organic material.
	Off-Base	18/08/2021	Silty SAND. Medium to coarse grain, loose, dark grey.
	Off-Base	22/08/2022	silty SAND, light grey, fine to coarse grained. No odour. Nil
	Off-Base	8/03/2023	CLAY, fine, brown, small amounts of gravel and sand. No odour.
G and Central Sub-Catchment			
SD109	Former Fire Station	29/10/2020	sandy CLAY, low plasticity, dark brown, with some, dry to moist, soft. highly organic
	Former Fire Station	29/03/2021	Sandy gravelly CLAY. Low plasticity, soft, angular sands and gravels, wet, with some organic materials.
	Former Fire Station	16/08/2021	Sandy, silty, CLAY. Low plasticity, fine grain sand, brown, moist, with medium to coarse gravels.
	Former Fire Station	1/03/2022	Silty GRAVEL, cobbles to boulders present, grey and brown, saturated, very poorly graded. No odour. Low organic content (leaves). Very rocky/gravelly.
	Former Fire Station	22/08/2022	gravelly SAND, well graded, sub rounded gravel, dry. No odour. Some surface algae
	Former Fire Station	6/03/2023	SAND, brown, medium grained, poorly graded, wet, No odour.
SD110	Former Fire Station	29/10/2020	CLAY, medium to high plasticity, brown-grey with grey mottled, with some gravels and organics, dry to moist, soft.
	Former Fire Station	29/03/2021	Sandy CLAY. Low plasticity, firm, grey with orange mottling, moist.
	Former Fire Station	16/08/2021	Sandy CLAY. Low plasticity, medium grain sub-angular sand, brown, moist, with medium gravels.
	Former Fire Station	1/03/2022	CLAY and SILT, grey/brown, low plasticity, poorly graded. No odour. High organic content (reeds and leaves).
	Former Fire Station	22/08/2022	sandy CLAY, medium plasticity, dark grey, fine grained sand, wet. No odour. High organic content
	Former Fire Station	6/03/2023	Sandy CLAY, brown, low plasticity, firm, moist. No odour.
SD129	Lavarack Golf Course & Sporting Field	29/10/2020	SAND, fine to medium, well graded, sub-rounded to sub-angular, pale brown with brown speckled, dry, very loose.
	Lavarack Golf Course & Sporting Field	26/03/2021	Silty, sandy GRAVEL. Medium to coarse sand and gravels, balck, with organic material.
	Lavarack Golf Course & Sporting Field	18/08/2021	Silty GRAVEL. Fine gravel, brown and orange, dry, with some sand.
	Lavarack Golf Course & Sporting Field	2/03/2022	Gravelly SAND, brown/red, poorly graded, some fine cohesive particles, moist. No odour. High organic content (grass, roots).
	Lavarack Golf Course & Sporting Field	24/08/2022	SAND, medium to coarse grained, loose, brown to yellow, dry. No odour. Organics (leaves)
	Lavarack Golf Course & Sporting Field	6/08/2023	CLAY, pale brown grey, low plasticity, wet, No odour.
SD130	Lavarack Golf Course & Sporting Field	29/10/2020	SAND, non-plastic, dark brown with red-brown , with some gravels, clay and organic matter, moist, soft.
	Lavarack Golf Course & Sporting Field	26/03/2021	Silty, gravelley SAND. Black sand, orange/brown gravels, saturated, with organic material.
	Lavarack Golf Course & Sporting Field	18/08/2021	SAND. Medium to coarse, sub-rounded to sub-angular, brown, orange and pink, dry, with medium gravels.
	Lavarack Golf Course & Sporting Field	2/03/2022	Gravelly SAND, reddish/brown, poorly graded, moist. No odour. Low organic content. Moisture increasing with depth.
	Lavarack Golf Course & Sporting Field	24/08/2022	SAND, medium to coarse grained, loose, brown to yellow, dry. No odour. Nil
	Lavarack Golf Course & Sporting Field	8/03/2023	SAND, brown, medium grained, with gravel, wet, with algae. High organic content. No odour.
SD133	Lavarack Golf Course & Sporting Field	29/10/2020	silty CLAY, low plasticity, dark grey, fine grained, dry to moist
	Lavarack Golf Course & Sporting Field	29/03/2021	Sandy gravelly CLAY. Low plasticity, firm, fine sands, medium to coarse gravels, grey/brown, moist, with organic materials and some biota (ants and worms)
	Lavarack Golf Course & Sporting Field	16/08/2021	Sandy CLAY. Low plasticity, firm, fine sands, medium to coarse gravels, grey/brown.
	Lavarack Golf Course & Sporting Field	1/03/2022	Silty SAND, soft, grey, fine, poorly graded, dry, organic material present. No odour.
	Lavarack Golf Course & Sporting Field	23/08/2022	gravelly sandy CLAY, grey, low plasticity, medium grained sand, fine to coarse angular gravel, dry. No odour. Organic content (grass and plat roots)
	Lavarack Golf Course & Sporting Field	8/03/2023	Sandy CLAY, brown, low plasticity, wet. No odour.
SD134	Lavarack Golf Course & Sporting Field	29/10/2020	sandy-gravelly CLAY, low to medium plasticity, dark grey with grey mottled, with some silt and organic matter, wet, soft to firm, compost - decayed organic matter odour.
	Lavarack Golf Course & Sporting Field	1/04/2021	Sandy SILT. Fine to medium grain sands, dark grey/brown, saturated, with organic materials.
	Lavarack Golf Course & Sporting Field	18/08/2021	Silty CLAY. Low plasticity, grey, soft, saturated.
	Lavarack Golf Course & Sporting Field	1/03/2022	Silty CLAY, dark brown, medium plasticity, moist. No odour. High organic content (roots and leaves).
	Lavarack Golf Course & Sporting Field	22/08/2022	sandy SILT, soft, black, non plastic, fine to medium sand, dry. No odour. Minor organic content
	Lavarack Golf Course & Sporting Field	8/03/2023	Silty SAND, brown, medium grained, wet. Low organic content. No odour.
SD139	Top Middle and Lower Dams	29/10/2020	clayey SAND, medium to coarse, well graded, brown, highly organic - roots and leaves, saturated, loose, rotten egg (sulfurous).
	Top Middle and Lower Dams	29/03/2021	Sandy SILT. Black, saturated, with fine sands and organic material.
	Top Middle and Lower Dams	16/08/2021	Silty SAND. Medium grain sub-angular, black, saturated.
	Top Middle and Lower Dams	1/03/2022	Sandy SILT, dark brown, low plasticity, well graded, saturated. Organic odour. High organic content (roots, leaves and decaying sticks). Low proportion of soil matrix.
	Top Middle and Lower Dams	22/08/2022	Sandy CLAY, medium plasticity, dark brown, wet. Organic odour, high organic content - leaves and plant roots
	Top Middle and Lower Dams	6/03/2023	Sandy CLAY, brown, low plasticity, firm, dry. No odour.

Location ID	Source Area / Area of Interest	Sampled Date	Sample Comments
SD140	Top Middle and Lower Dams	29/10/2020	clayey SILT, non-plastic, dark grey with brown , dry, compost - decayed organic matter odour. high organic content
	Top Middle and Lower Dams	29/03/2021	Clayey SILT. Soft, dark grey, with some fine sands and organic material.
	Top Middle and Lower Dams	16/08/2021	Silty SAND. Medium grain sub-angular, saturated, with medium gravels.
	Top Middle and Lower Dams	1/03/2022	SILT and SAND, grey and dark grey, moderately graded. No odour. High organic content (roots and leaves).
	Top Middle and Lower Dams	22/08/2022	gravelly SAND, fine to coarse, poorly graded, wet. No odour. High organic content
	Top Middle and Lower Dams	6/03/2023	silty SAND, brown, medium grained, poorly graded, dry. High root content. No odour.
SD144	Top Middle and Lower Dams	13/05/2021	Silty SAND. Fine to coarse sand with medium sub-angular gravels, black, saturated, with organic material.
	Top Middle and Lower Dams	16/08/2021	Sandy SILT. Low plasticity, grey brown, saturated, with fine gravels.
	Top Middle and Lower Dams	1/03/2022	Silty SAND, dark brown, fine grained. No odour. High organic content (roots and leaves).
	Top Middle and Lower Dams	22/08/2022	sandy CLAY, low plasticity, fine grained sand, wet. No odour. Some organic content (leaves)
	Top Middle and Lower Dams	10/03/2023	CLAY, soft, dark brown, low plasticity, fine grained, subrounded sand, moist. Some organic content (leaves). No odour.
SD128	Base Boundary	29/10/2020	SAND, medium to coarse, poorly graded, sub-rounded to sub-angular, red-brown with dark brown , trace of silt, moist, very loose, weakly cemented.
	Base Boundary	26/03/2021	Silty CLAY. Medium plasticity, firm, grey, with some sand and gravels, with some organic material.
	Base Boundary	18/08/2021	Silty gravelly SAND. Fine to medium grain, sub-angular, loose, dry.
	Base Boundary	2/03/2022	Sandy GRAVEL, brown/grey, poorly graded, moderate organic content (roots). No odour.
	Base Boundary	23/08/2022	gravelly sandy CLAY, low plasticity, fine to coarse grained sand, fine to coarse angular gravel, moist, dark brown. No odour. Organic content (roots), location was dry
	Base Boundary	9/03/2023	CLAY, grey, low plasticity, firm, wet. Organic content (roots), location was dry. No odour.
SD132	Base Boundary	29/10/2020	silty, sandy CLAY, fine grained, dark grey, saturated, very soft, highly organic - leaves and roots
	Base Boundary	1/04/2021	Sandy CLAY. Fine sands, grey with brown/orange mottling, saturated, with some angular gravels.
	Base Boundary	18/08/2021	Location not sampled. Area was rocky with no sediment or water.
	Base Boundary	22/04/2022	Gravelly SAND, fine to coarse grain with fine to coarse gravels, some cobbles, loose, wet, dark brown, some organics (roots). No odour.
	Base Boundary	22/08/2022	silty CLAY, firm, medium plasticity, dark brown to black, trace fine to medium angular gravel. No odour. Nil
	Base Boundary	6/03/2023	SAND, brown , medium to large grained, well graded, wet. Low organic content. Slow flow. No odour.
SD203	Off-Base	2/11/2020	SAND, fine to medium, well graded, brown with red-brown speckled, saturated, very loose, rotten egg (sulfurous).
	Off-Base	29/03/2021	Silty SAND. Fine sands, dark brown, firm, saturated, with organic materials
	Off-Base	19/08/2021	Silty SAND. Fine to medium grain, firm, brown, saturated.
	Off-Base	2/03/2022	SAND, medium coarse, saturated, well graded, angular, low organic content. No odour.
	Off-Base	22/08/2022	SAND, loose, medium to coarse grained, light brown to yellow, wet. No odour. Nil
	Off-Base	8/03/2023	SAND, loose, light brown, medium grained, wet. No odour.
SD205	Off-Base	2/11/2020	SILT, non plastic, grey, fine grained, saturated
	Off-Base	29/03/2021	Sandy SILT. Fine to medium sands, loose, saturated, with organic materials.
	Off-Base	19/08/2021	Sandy SILT. Medium plasticity.
	Off-Base	2/03/2022	Silty CLAY, dark brown, medium plasticity, moist. Organic odour. Moderate organic content (roots and leaves).
	Off-Base	22/08/2022	gravelly SAND, poorly graded, loose, wet. No odour. Nil
	Off-Base	9/03/2023	CLAY, loose, grey, small fine gravel, low plasticity. Low organic matter. No odour.
SD211	Off-Base	2/11/2020	silty-sandy GRAVEL, low plasticity, dark grey with black , with some clay, saturated, soft, some organic matter
	Off-Base	1/04/2021	Silty SAND. Loose to firm, medium sands, dark grey, saturated, with organic materials.
	Off-Base	19/08/2021	Silty SAND. Black, saturated.
	Off-Base	3/03/2022	Sandy GRAVEL, dark grey, fine graded, moderate organic content (woody material). No odour.
	Off-Base	25/08/2022	sandy CLAY, brown to black, low plasticity, fine to medium grained, wet. No odour. Organic content - roots and leaves
	Off-Base	9/03/2023	gravelly CLAY, brown, low plasticity, firm. Wet. No flow. No odour.
SD212	Off-Base	2/11/2020	sandy SILT, non-plastic, black with dark grey , trace of coarse gravels, saturated, very soft, some organic matter
	Off-Base	1/04/2021	Silty SAND. Loose, fine to medium sands, grey/brown, saturated, with organic materials.
	Off-Base	19/08/2021	Silty SAND. Sub-angular, mottled brown and black, saturated.
	Off-Base	3/03/2022	SAND, reddish brown, coarse, poorly graded, with some medium gravel, saturated, moderate organic material. No odour.
	Off-Base	25/08/2022	gravelly SAND, brown, poorly graded, wet, some medium sub angular gravel. No odour. Some organic content (Plant roots and decomposed grass and leaves)
	Off-Base	9/03/2023	SAND, yellow, fine grained sand, poorly graded, wet. Low flow. No odour.
SD233	Off-Base	2/11/2020	CLAY, low to medium plasticity, pale grey, with some silt, saturated, firm. highly organic
	Off-Base	29/03/2021	Sandy SILT. Fine sands, dark brown, firm, saturated, with organic materials
	Off-Base	18/08/2021	Silty SAND. Loose, dry.
	Off-Base	2/03/2022	CLAY, dark brown, medium plasticity, wet. No odour. High organic content
	Off-Base	22/08/2022	loamy SAND, low plasticity, dark brown, wet, fine grained sand, loose. No odour. Organic content - leaves
	Off-Base	15/03/2023	SAND, loose to medium dense, brown, fine to medium grained, subangular, with clay. Organic content (tree and grass roots). No odour.
SD244	Off-Base	3/11/2020	gravelly SAND, fine to coarse, poorly graded, angular to sub-angular, orange-brown, saturated, very loose. some shell fragments and small crustaceans
	Off-Base	26/03/2021	Gravelly SAND. Coarse sand, loose, coarse angular gravels, orange brown, saturated, with organic material.
	Off-Base	18/08/2021	Silty, sandy GRAVEL. Fine gravel, medium density, brown, saturated.
	Off-Base	22/08/2022	sandy GRAVEL, angular gravel, pale grey, wet. No odour. Nil
	Off-Base	8/03/2023	gravelly SAND, loose, brown, fine to medium gravel/sand. No odour.

Location ID	Source Area / Area of Interest	Sampled Date	Sample Comments
J/K and East Sub-Catchment			
SD119	Eastern PFAS Contamination Area	29/10/2020	SILT, non-plastic, black with black, with some organic matter, wet, very soft, compost - decayed organic matter odour.
	Eastern PFAS Contamination Area	29/03/2021	Silty SAND. Fine sands, dark brown, soft, saturated.
	Eastern PFAS Contamination Area	18/08/2021	Silty CLAY. Low plasticity, very soft, grey, saturated.
	Eastern PFAS Contamination Area	1/03/2022	Silty SAND, brown and black, fine grained, sub-angular, saturated, low organic content. No odour.
	Eastern PFAS Contamination Area	22/08/2022	gravelly SAND coarse, well graded, sub angular gravel, brown to yellow, moist. No odour. Some surface algae
SD121	Eastern PFAS Contamination Area	10/03/2023	Sand, loose, brown/black, fine grained, subangular, moist. Some surface algae. No odour.
	Eastern PFAS Contamination Area	29/10/2020	SILT, non-plastic, black with red-brown mottled, wet, very soft, compost - decayed organic matter odour odour.
	Eastern PFAS Contamination Area	29/03/2021	Silty CLAY. Low plasticity, soft, grey and brown, moist, with organic materials.
	Eastern PFAS Contamination Area	16/08/2021	Silty GRAVEL. Medium to coarse, sub-angular gravel, loose, dark grey, saturated.
	Eastern PFAS Contamination Area	22/04/2022	Clayey SAND, dark brown to dark grey, fine grained, loose, saturated with some organics (grass roots). No odour.
	Eastern PFAS Contamination Area	22/08/2022	clayey SAND, medium density, dark grey, low plasticity, wet, trace silt. Organic odour. Plant roots and surface algae
SD113	Eastern PFAS Contamination Area	6/03/2023	Silty CLAY, brown, med plasticity, with trace of sand. Plant roots and surface algae. No odour.
	On-Base	28/10/2020	SAND, brown, coarse grained, saturated, large cobbles and fine to coarse gravels
	On-Base	29/03/2021	Gravelly SAND. Loose, brown/orange, saturated, with traces of silt.
	On-Base	18/08/2021	SAND. Medium to coarse grain, sub-angular, very loose, light brown and orange, dry, with some silt.
	On-Base	1/03/2022	SAND, loose, fine to medium grained, sub angular to rounded, well graded, dry, low organic content. No odour.
	On-Base	22/08/2022	gravelly SAND, well graded with sub rounded gravel, trace clay. No odour. Surface algae present
	On-Base	9/03/2023	gravelly SAND, well graded with sub rounded gravel. Low organic matter. No odour.
SD120	On-Base	28/10/2020	gravelly SAND, medium to coarse, well graded, sub-angular, brown with red, dry to moist, very loose, roots.
	On-Base	29/03/2021	Gravelly SAND. Brown, loose, saturated, with traces of silt.
	On-Base	18/08/2021	GRAVEL. Medium to coarse grain, sub-rounded to sub-angular, loose, brown, orange and black, dry, with cobbles and traces of silt.
	On-Base	1/03/2022	Gravelly SAND, poorly graded, moist, reddish brown, low organic content. No odour.
	On-Base	3/09/2022	gravelly SAND, well graded, medium grained, some medium angular to subangular gravel, brown to yellow. No odour. Minor organic material in sample
	On-Base	9/03/2023	gravelly SAND, well graded, medium grained, some medium angular to subangular gravel, brown to yellow. Minor organic material in sample. No odour.
SD135	Base Boundary	28/10/2020	SAND, red-orange, saturated.
	Base Boundary	29/03/2021	Silty SAND. Loose, medium grain, brown, saturated, with organic materials.
	Base Boundary	18/08/2021	SAND. Medium to coarse grain, sub-angular, orange, brown and pink, saturated.
	Base Boundary	1/03/2022	Gravelly SAND, soft, light brown and orange, sub angular to sub rounded coarse sand with fine to coarse gravels, saturated. No odour. High organic content
	Base Boundary	22/08/2022	gravelly SAND, fine to medium grained, poorly graded, wet. No odour. Organic content (roots)
	Base Boundary	6/03/2023	SAND, brown yellow, medium grained, poorly graded, wet. No odour.
SD136	Base Boundary	28/10/2020	SAND, brown, saturated. trace organic matter
	Base Boundary	26/03/2021	Sandy SILT. Soft, dark grey/brown, moist, with organic material.
	Base Boundary	16/08/2021	Sandy SILT. Low plasticity, firm, grey, dry, with medium sub-angular gravels.
	Base Boundary	2/03/2022	Silty SAND, reddish/brown, poorly graded, saturated. No odour. High organic content (algal biofilm and leaves).
	Base Boundary	23/08/2022	sandy CLAY, low plasticity, medium subangular sand, dark brown, high organic content. No odour. Upstream of a disturbed site - TCC sewer upgrade
	Base Boundary	6/03/2023	SAND, yellow brown, medium grained, poorly graded, wet. No odour.
SD220	Off-Base	2/11/2020	silty CLAY, low plasticity, dark grey, saturated, soft, highly organic - roots.
	Off-Base	1/04/2021	Silty sandy CLAY. Low plasticity, very fine sands, grey/brown with orange mottling, wet, with organic materials.
	Off-Base	18/08/2021	Silty SAND. Saturated.
	Off-Base	2/03/2022	CLAY, dark brown/black, medium plasticity, moderate organic content. No odour.
	Off-Base	22/08/2022	silty CLAY, grey and black, wet, medium plasticity. Organic odour. Organic content
	Off-Base	9/03/2023	CLAY, grey, high plasticity, wet. Low organic matter, low flow. No odour.
SD232	Off-Base	2/11/2020	silty CLAY, low plasticity, grey, saturated, soft to firm, compost - decayed organic matter odour.
	Off-Base	29/03/2021	SILT. Soft, black, saturated, with organic material.
	Off-Base	18/08/2021	Silty SAND. Sub-angular, dense, with traces of gravels.
	Off-Base	2/03/2022	SILT and CLAY, brown and black, medium plasticity, moderate organic content. No odour.
	Off-Base	22/08/2022	silty CLAY, soft, medium plasticity, black, wet. No odour. Some organic content
	Off-Base	9/03/2023	CLAY, loose, grey, low plasticity, medium sized gravel. Some organic matter. No odour.
SD242	Off-Base	2/11/2020	silty CLAY, medium plasticity, grey, with some sub angular gravels, saturated, soft to firm. dead fish heads nearby - likely from fishing
	Off-Base	29/03/2021	Silty CLAY. Soft, saturated, dark grey, with angular gravels and fine to coarse sand, with organics.
	Off-Base	16/08/2021	Sandy SILT. Low plasticity, very soft, grey, saturated.
	Off-Base	22/04/2022	Sandy CLAY, soft, dark brown to dark grey, medium plasticity, saturated, some fine sands with trace organics (grass roots). No odour.
	Off-Base	22/08/2022	sandy CALY, soft, medium plasticity, brown and black, wet, fine grained sand with some medium angular gravel. No odour. Nil
	Off-Base	9/03/2023	CLAY, light grey, fine sand, high plasticity. No odour.
SD243	Off-Base	2/11/2020	silty CLAY, medium plasticity, dark grey, saturated, soft.
	Off-Base	29/03/2021	Silty CLAY. Dark grey, saturated, with fine sands and inclusions of high plasticity clay.
	Off-Base	16/08/2021	Sandy SILT. Medium plasticity, fine grain, dark grey, saturated.
	Off-Base	2/03/2022	Silty CLAY, dark grey, black, medium plasticity, low organic content. No odour.
	Off-Base	22/08/2022	clayey SAND, loose, fine grained, dark brown and black, low plasticity clay. No odour. Nil
	Off-Base	9/03/2023	CLAY, firm, dark grey, medium fine sand/gravel. Low organic matter. No odour.

Location ID	Source Area / Area of Interest	Sampled Date	Sample Comments
SD245	Off-Base	3/11/2020	gravelly SILT, non-plastic, dark grey, saturated, soft, sub-angular gravels.
	Off-Base	26/03/2021	Silty SAND. Fine, loose, dark grey, saturated, with organic material.
	Off-Base	18/08/2021	Silty CLAY. Low plasticity, soft, saturated.
	Off-Base	22/08/2022	silty SAND, pale grey, fine to coarse grained. Sulforous odour and high organic content
	Off-Base	8/03/2023	CLAY, brown, firm, wet. High organic matter. No odour.

Header table for sediment analytical results, listing units (mg/kg) for various PFAS compounds including PFOS, PFHxS, PFOA, 4:2 FTS, 6:2 FTS, 8:2 FTS, 10:2 FTS, EtFOSA, EtFOSAA, EtFOSE, FOSA, MeFOSA, MFOSAA, MeFOSE, PFBS, PFPeS, PFHpS, PFDS, PFBA, PFHxA, PFPeA, PFHpA, PFDA, PFDoDA, PFNA, PFTeDA, PFTDA, PFUnDA, and Sum of PFOS + PFHxS, and Sum of PFAS.

Location Sample Date

Main data table for sediment analytical results, grouped by location: Top, Middle and Lower Dams (SD139, SD140, SD144), Base Boundary (SD128, SD132), and Off-Base (SD203, SD205, SD211). Each row includes sample dates and concentration values for the various PFAS compounds.

Appendix C

Graphs

Graphs – Historical Concentrations

Historical concentrations of the sum of perfluorooctane sulfonate and perfluorohexane sulfonate (i.e. PFOS+PFHxS), as well as concentrations of perfluorooctanoic acid (PFOA) in groundwater and surface water have been displayed graphically, by catchment area.

The following is noted regarding the graphical presentations:

- Straight lines have been used for the purpose of joining sequential data points only. The lines do not represent trends in the concentrations between data points.
- Where a concentration value was reported below the laboratory limit of reporting (i.e. <LOR), the LOR value itself has been adopted for graphing purposes
- In groundwater samples, where concentrations of either PFOS+PFHxS or PFOA were reported <LOR, the LOR value was 0.01 µg/L in the majority of the samples, with the exception of the following:
 - 0.02 µg/L for PFOA in select samples collected at MW217, MW124, MW235S and MW117D.
 - 0.02 µg/L for PFOS+PFHxS in select samples collected at MW124 and MW235S.
 - 0.04 µg/L for PFOA in select samples collected at MW217, MW236S and MW232.
 - 0.1 µg/L for PFOA in select samples collected at MW217, MW122 and MW232.
 - 0.1 µg/L for PFOS+PFHxS in a sample collected at MW217.
 - 0.25 µg/L for PFOS+PFHxS and PFOA in a sample collected at MW124.
- In surface water samples, where concentrations of either PFOS+PFHxS or PFOA were reported <LOR, the LOR value was 0.01 µg/L in the majority of the samples, with the exception of the following:
 - 0.001 µg/L for PFOA in select samples collected at SW227, SW242, SW243, SW244 and SW245.
 - 0.5 µg/L for PFOA in a sample collected at SW243.
- Within each graph, if concentrations reported at multiple sample locations are equal (for instance where concentrations are reported as <LOR) the data points and lines associated with some sample locations may be obstructed by the datapoints and lines associated with another location, hence not visible in the graph. In such cases, the locations are still visible within the legend of the graph.

Historical groundwater and surface water concentrations by catchment area are displayed graphically in the **Section 1.0** and **Section 2.0**, respectively.

1.0 Groundwater

1.1 A and West Sub-Catchment

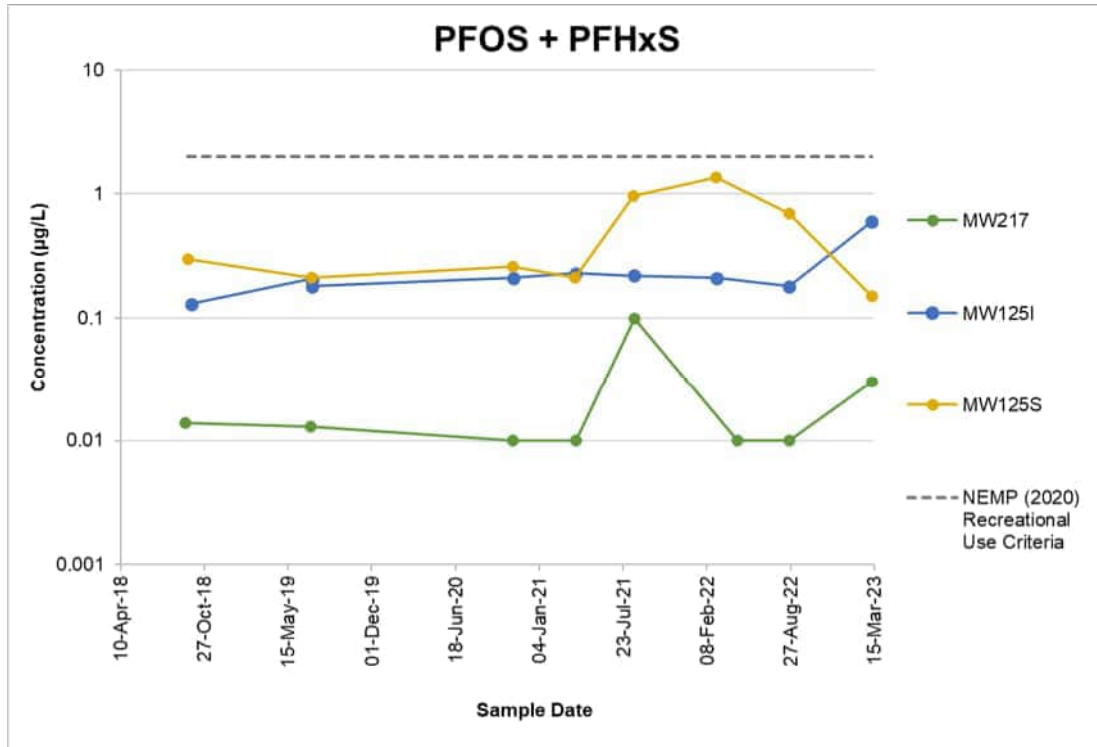


Plate 1 PFOS + PFHxS Concentrations

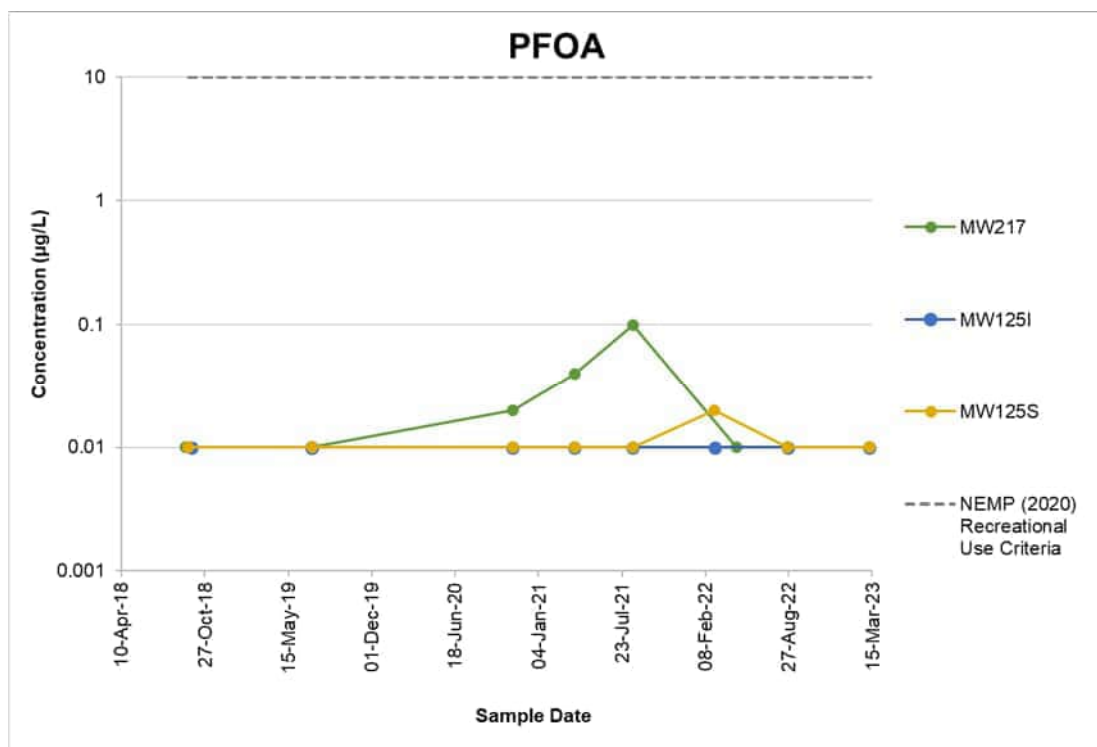


Plate 2 PFOA Concentrations

1.2 G and Central sub-catchment

1.2.1 Source area/area of interest

1.2.1.1 Former Fire Station, Former Fire Training Area, Former Helicopter Squadron

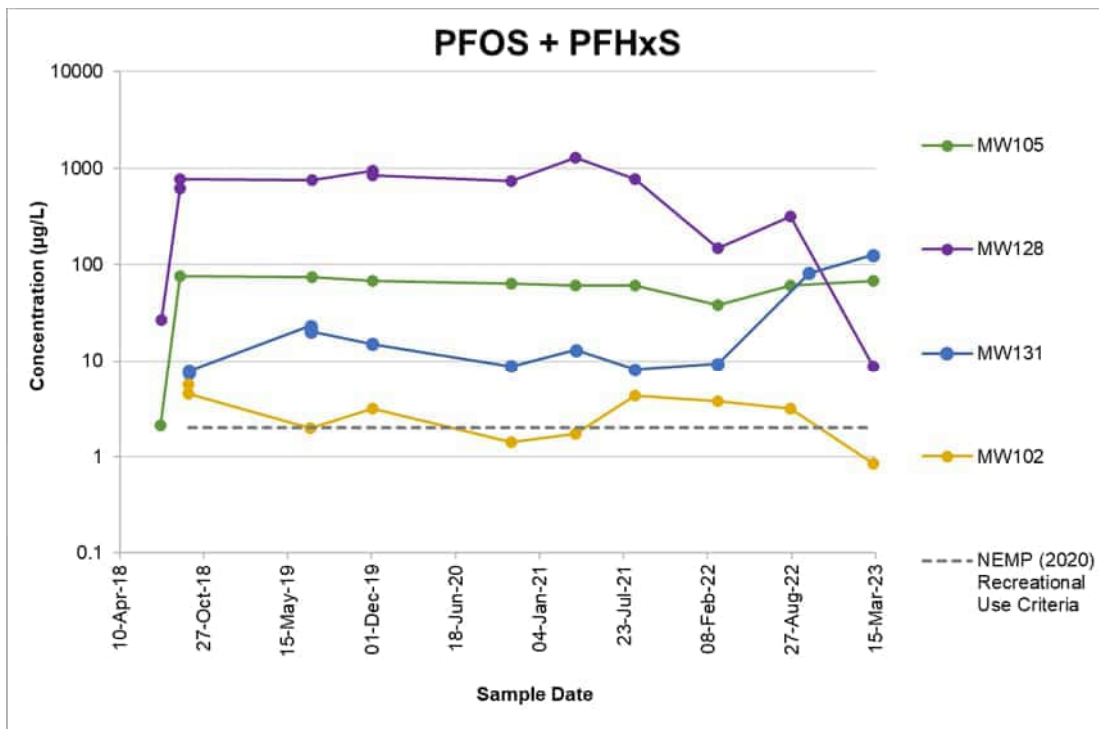


Plate 3 PFOS + PFHxS Concentrations

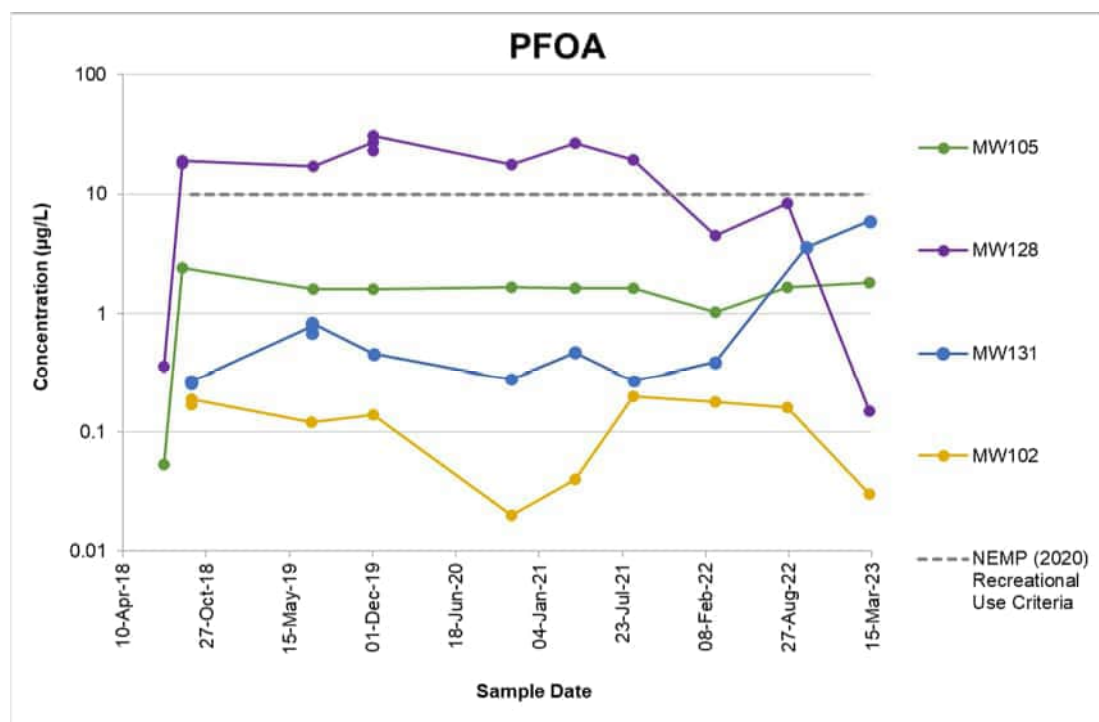


Plate 4 PFOA Concentrations

1.2.1.2 Lavarack Golf Course and Sporting Fields

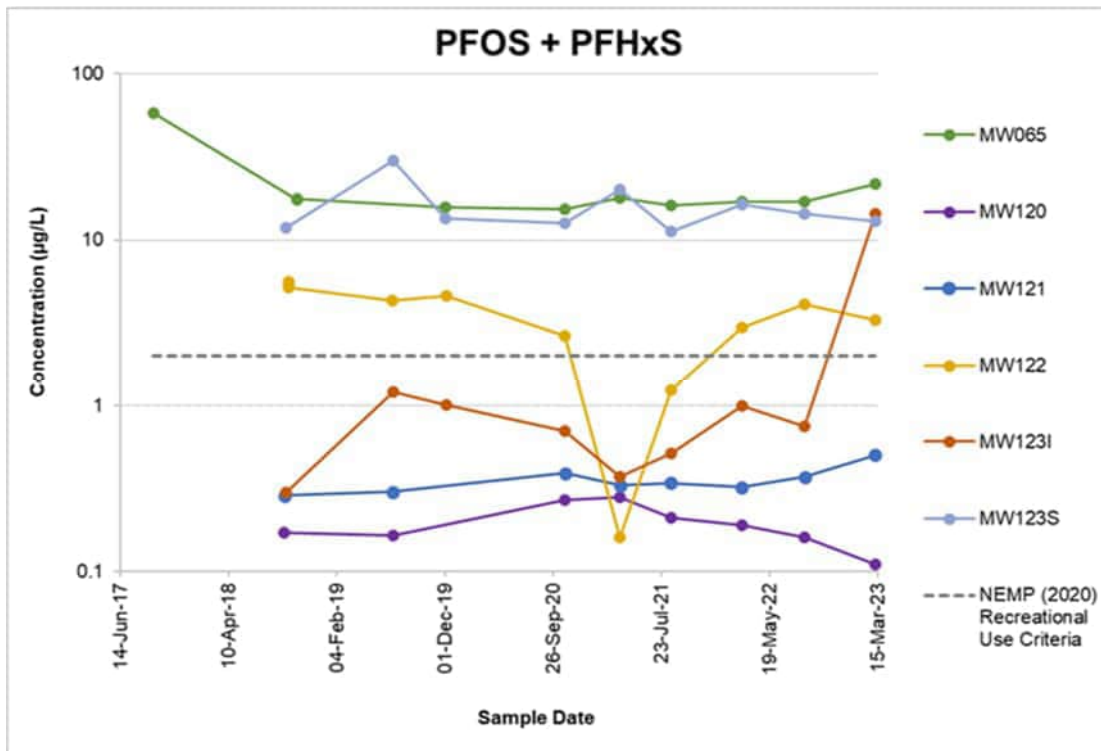


Plate 5 PFOS + PFHxS Concentrations

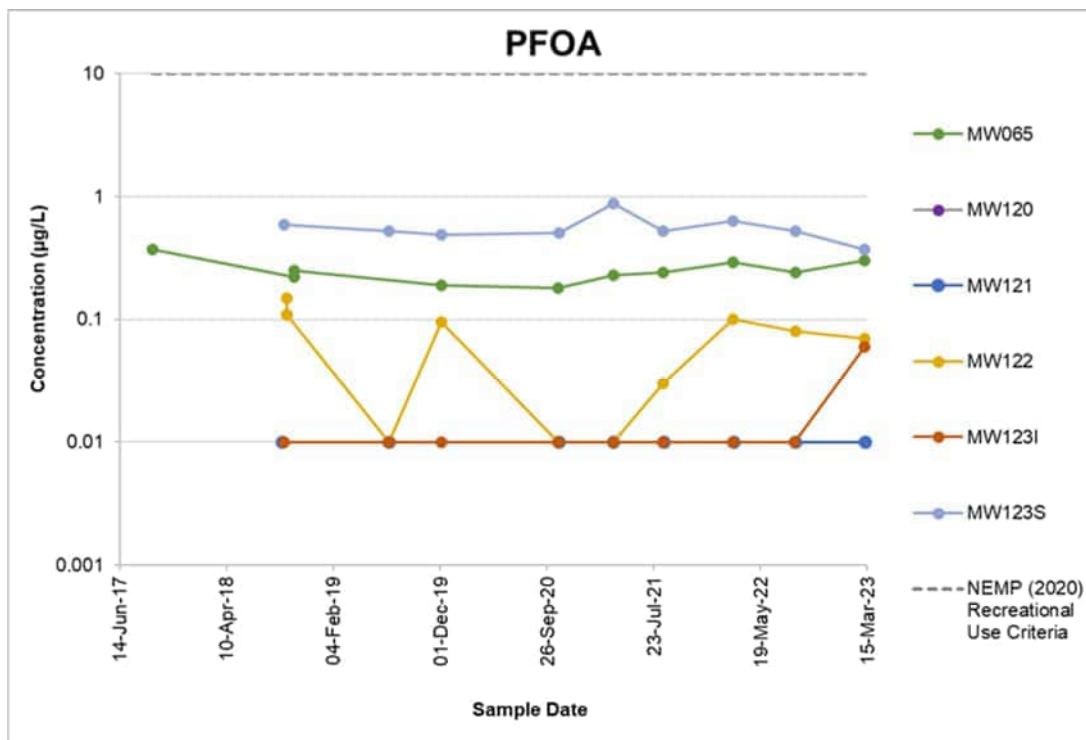


Plate 6 PFOA Concentrations

1.2.1.3 Monocell, Suspected AFFF Disposal Area, Top, Middle and Lower Dams

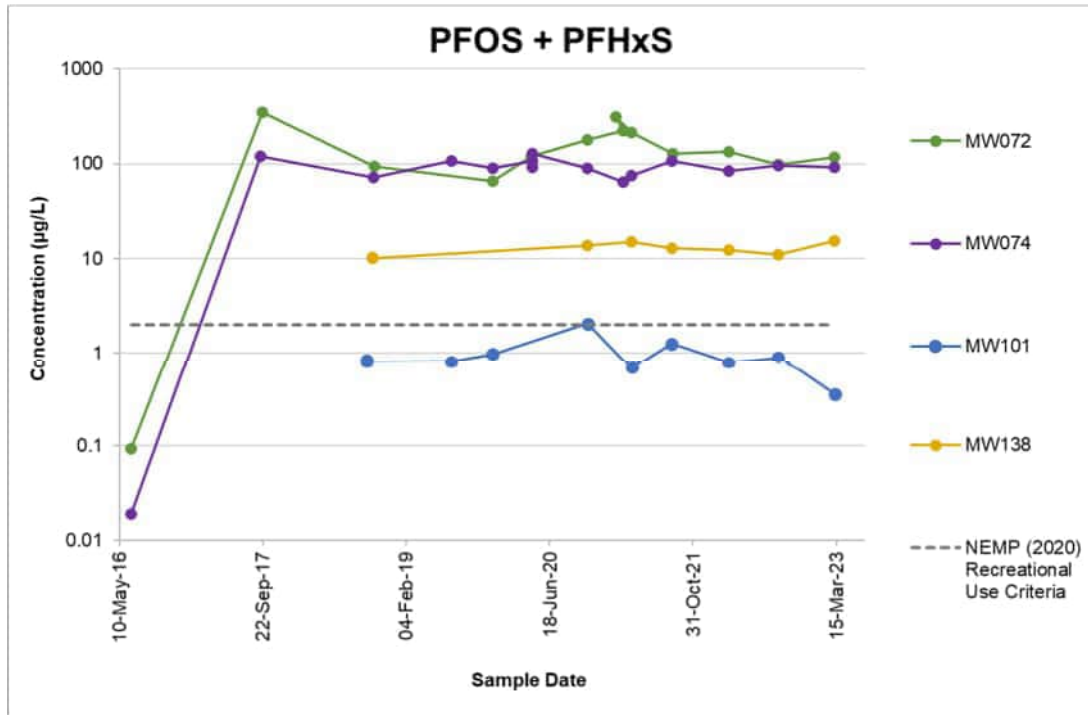


Plate 7 PFOS + PFHxS Concentrations

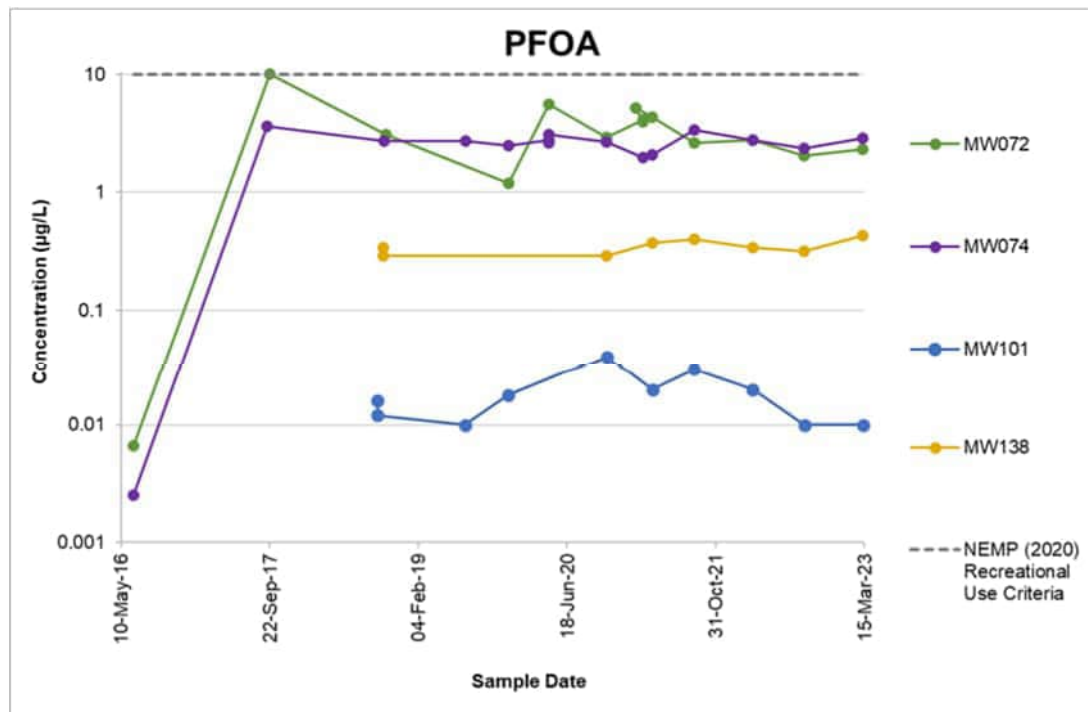


Plate 8 PFOA Concentrations

1.2.2 Base Boundary

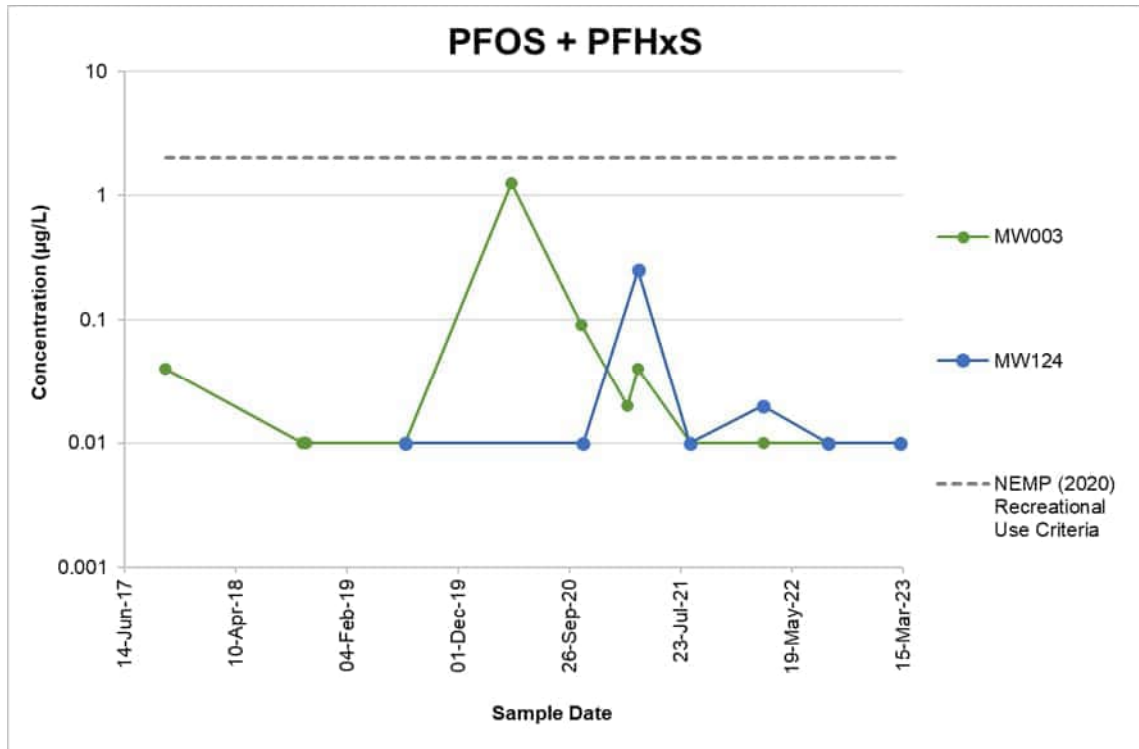


Plate 9 PFOS + PFHxS Concentrations

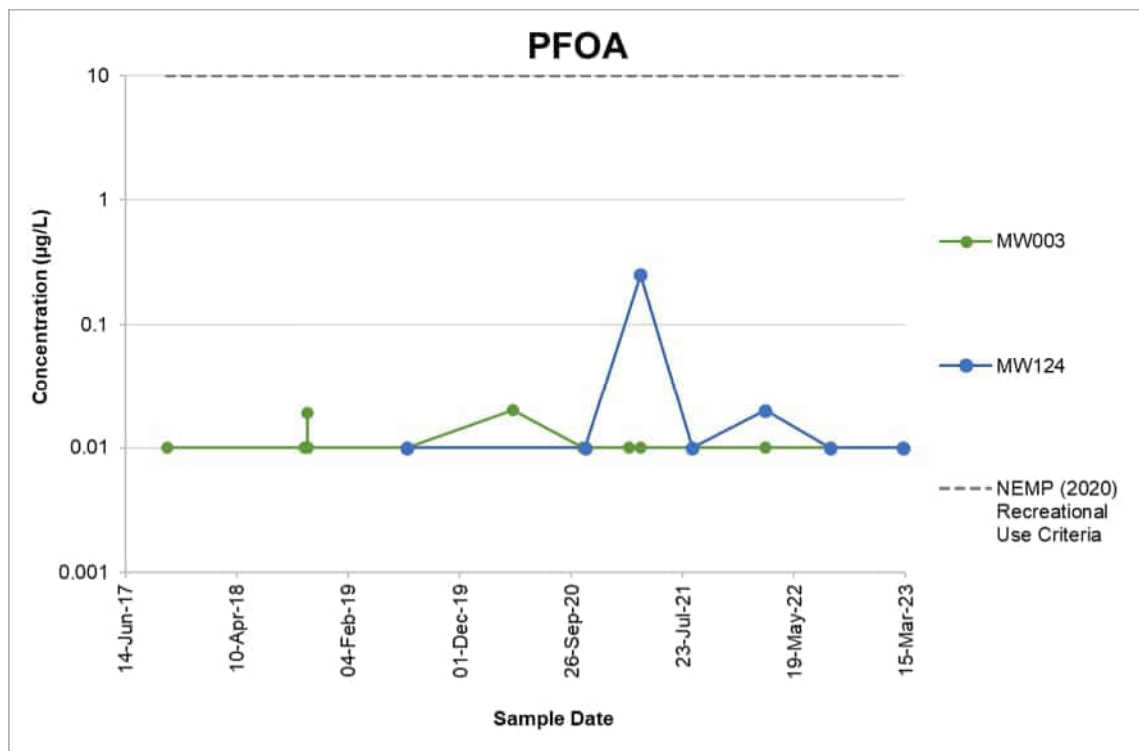


Plate 10 PFOA Concentrations

1.2.3 Off-Base Management Area

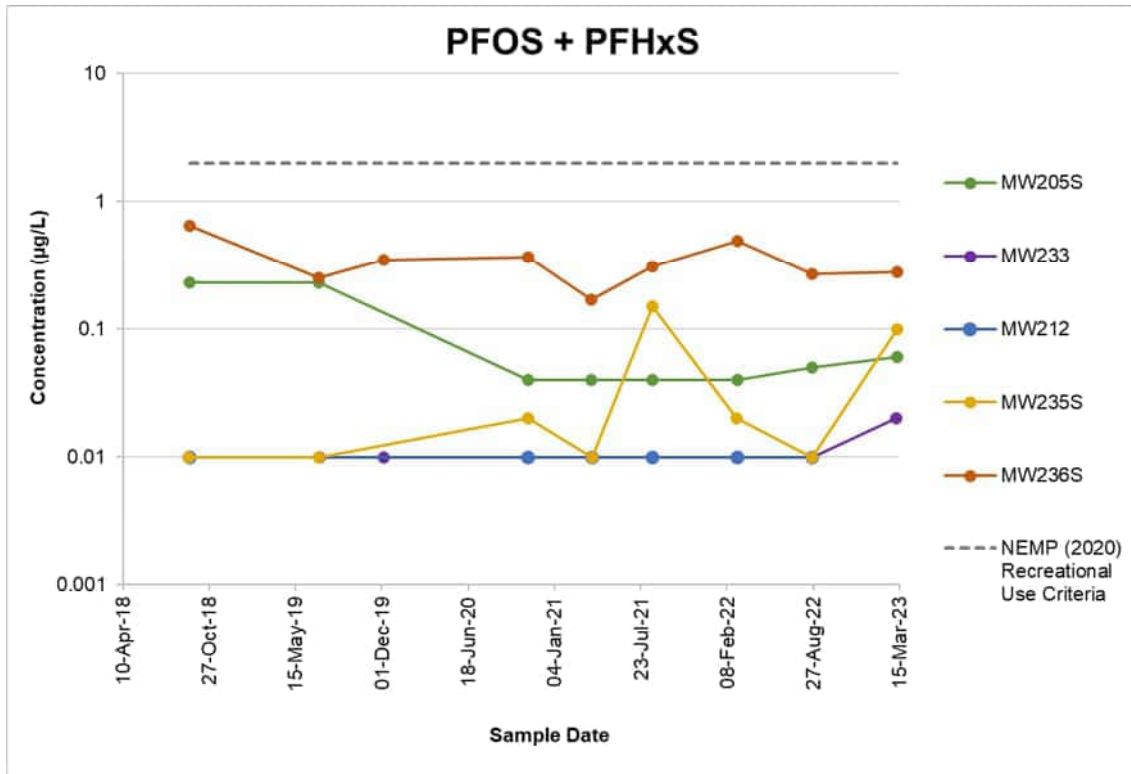


Plate 11 PFOS + PFHxS Concentrations

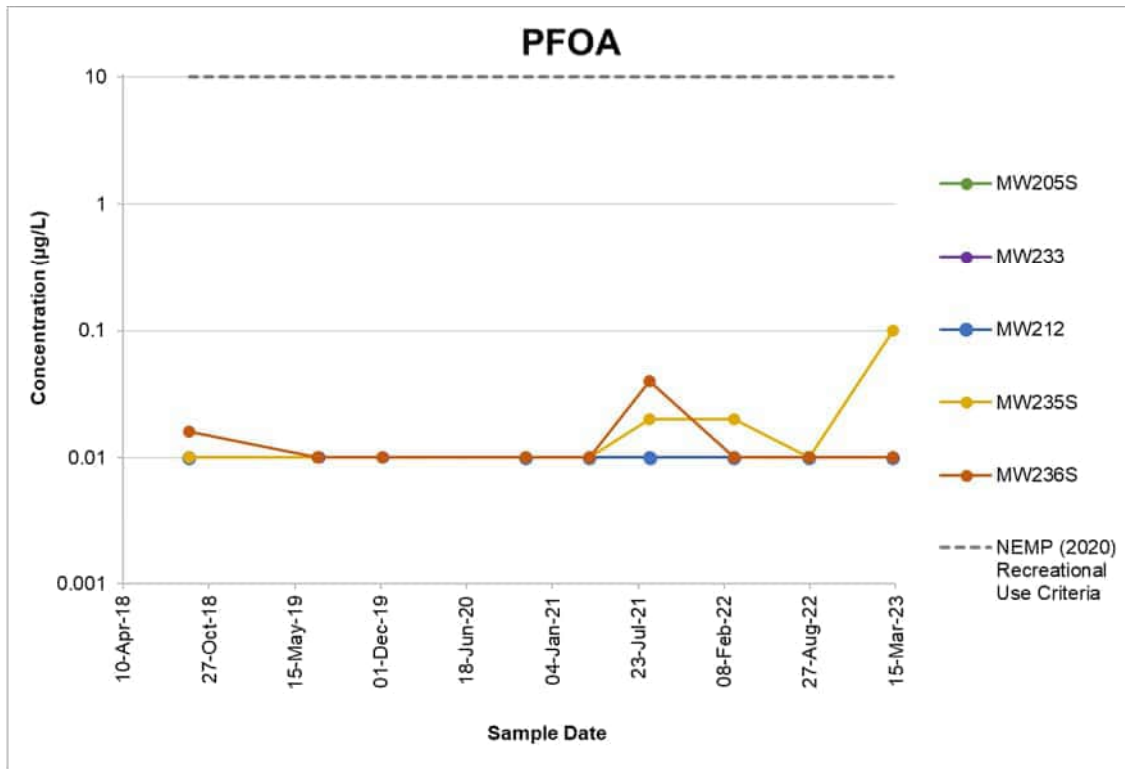


Plate 12 PFOA Concentrations

1.3 J/K and East Sub-Catchment

1.3.1 Source area/area of interest

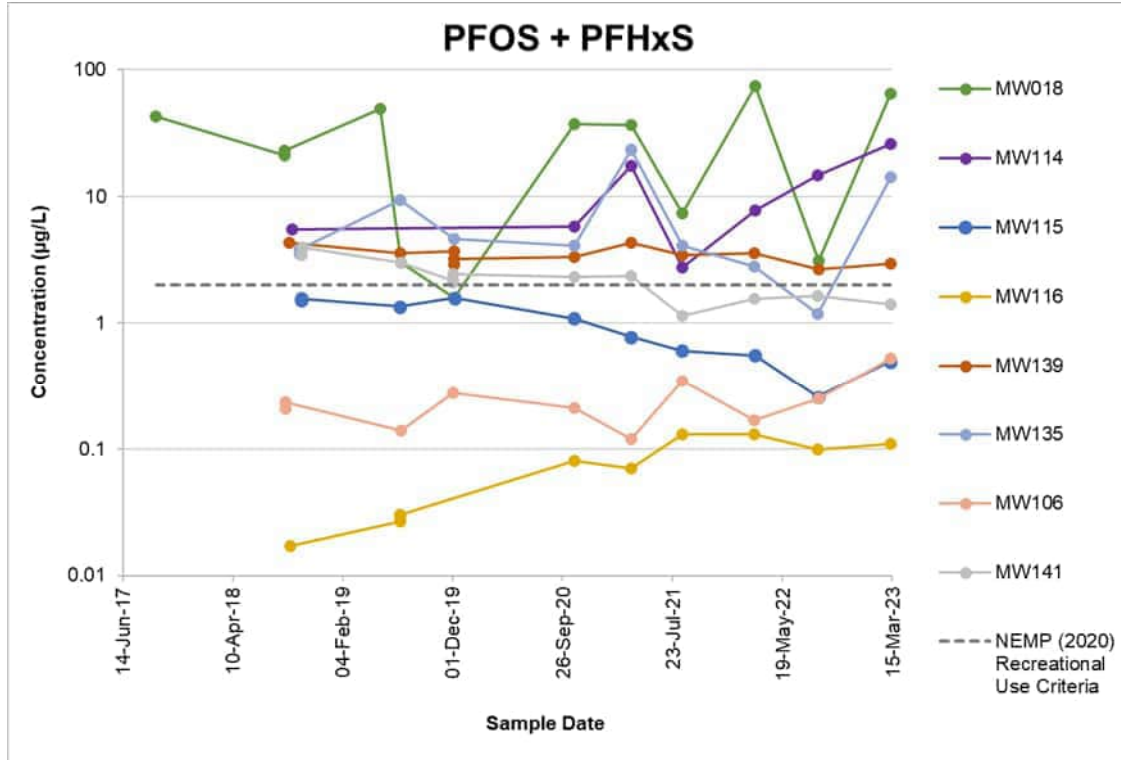


Plate 13 PFOS + PFHxS Concentrations

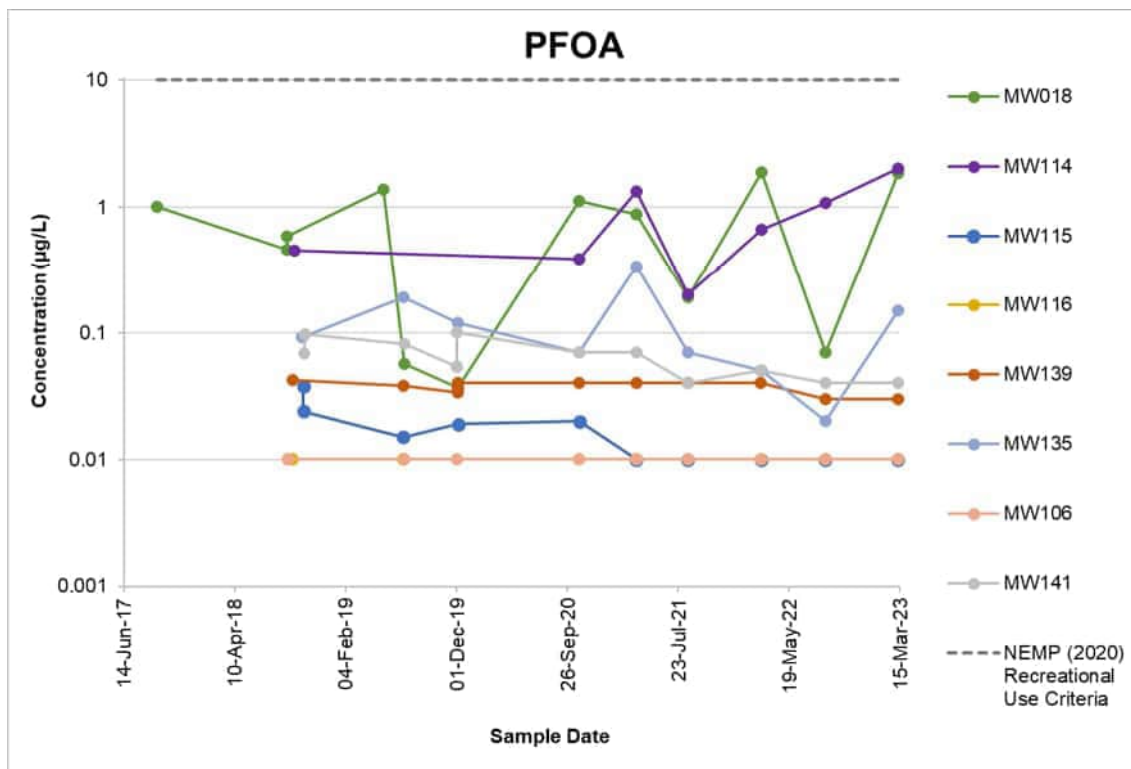


Plate 14 PFOA Concentrations

1.3.2 Base Boundary

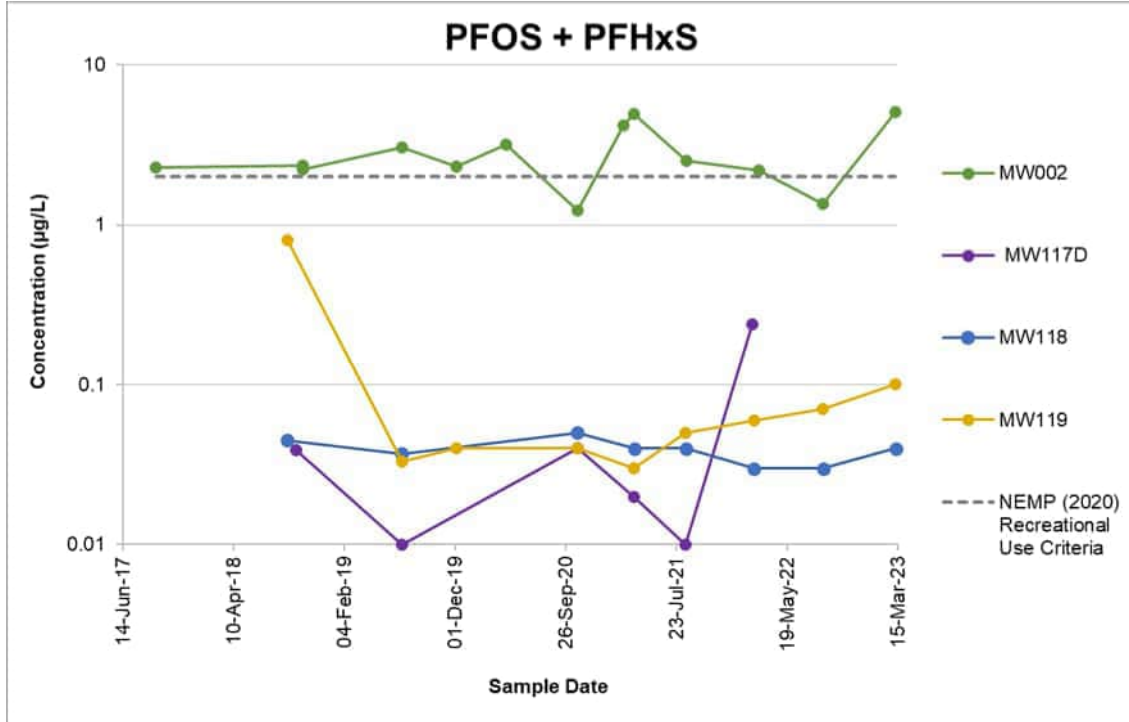


Plate 15 PFOS + PFHxS Concentrations

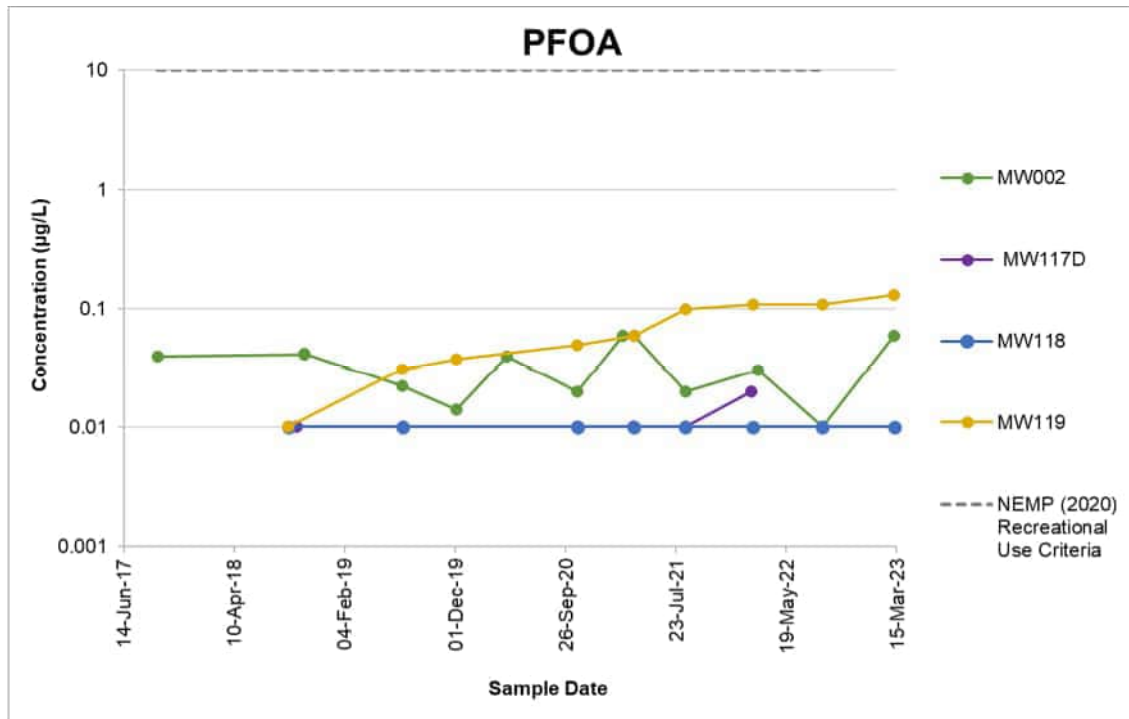


Plate 16 PFOA Concentrations

1.3.3 Off-Base Management Area

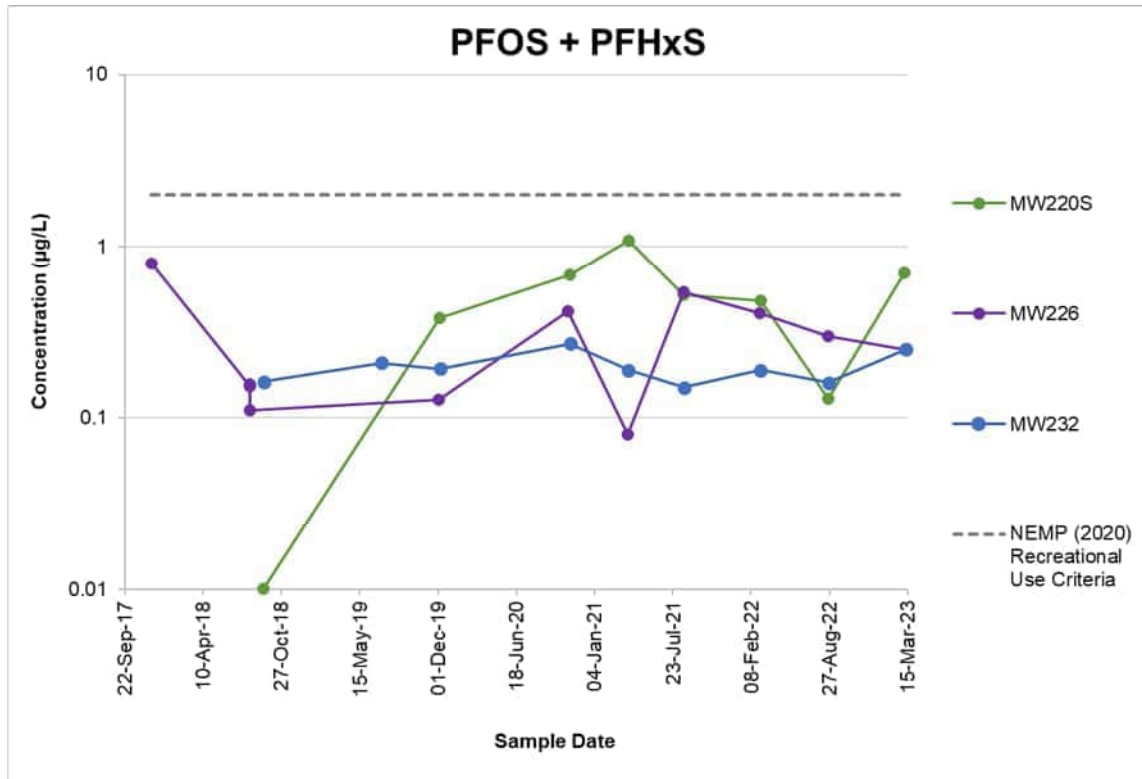


Plate 17 PFOS + PFHxS Concentrations

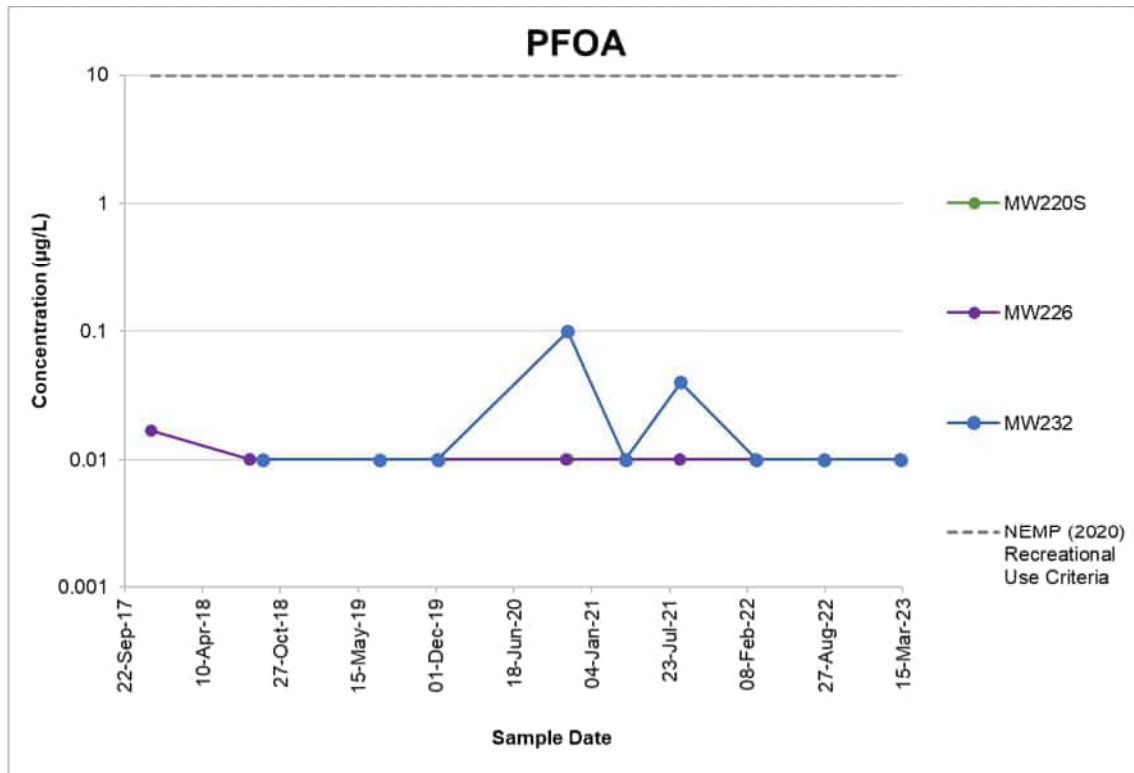


Plate 18 PFOA Concentrations

2.0 Surface Water

2.1 A and West Sub-Catchment

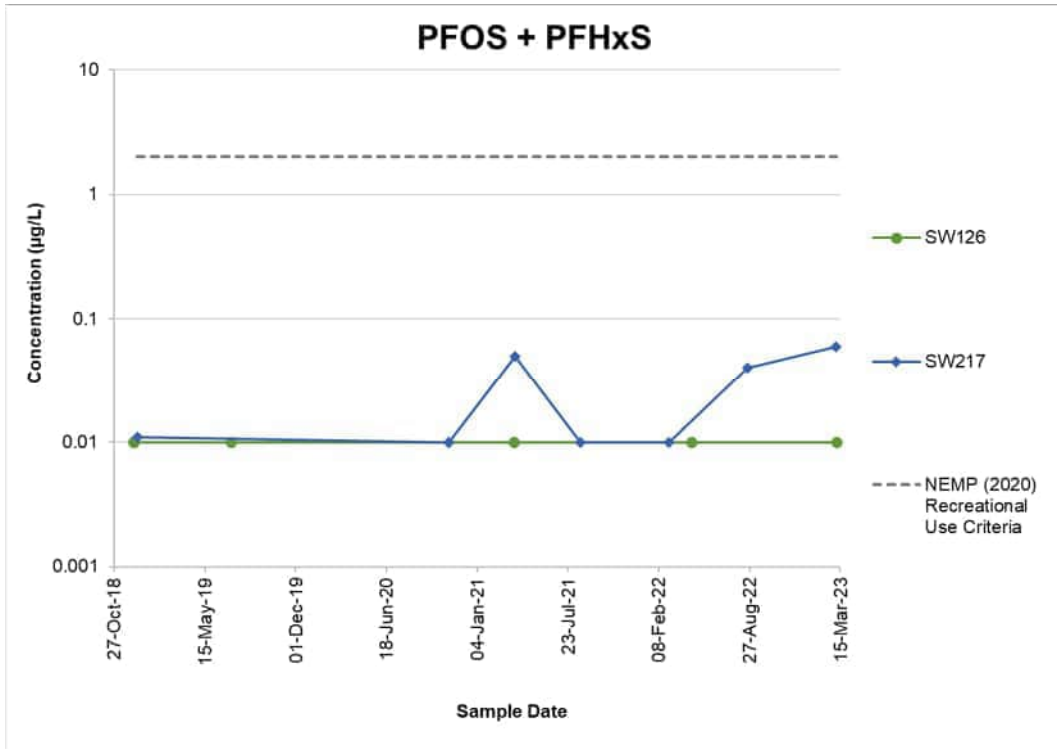


Plate 19 PFOS + PFHxS Concentrations

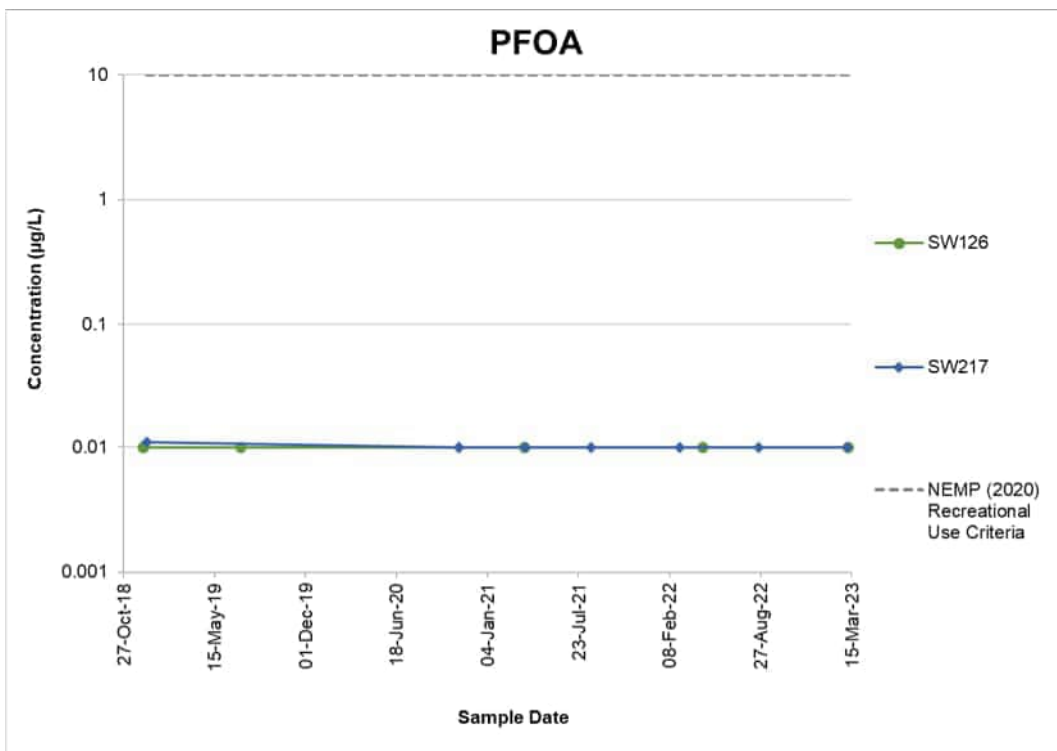


Plate 20 PFOA Concentrations

2.2 G and Central sub-catchment

2.2.1 Source area/area of interest

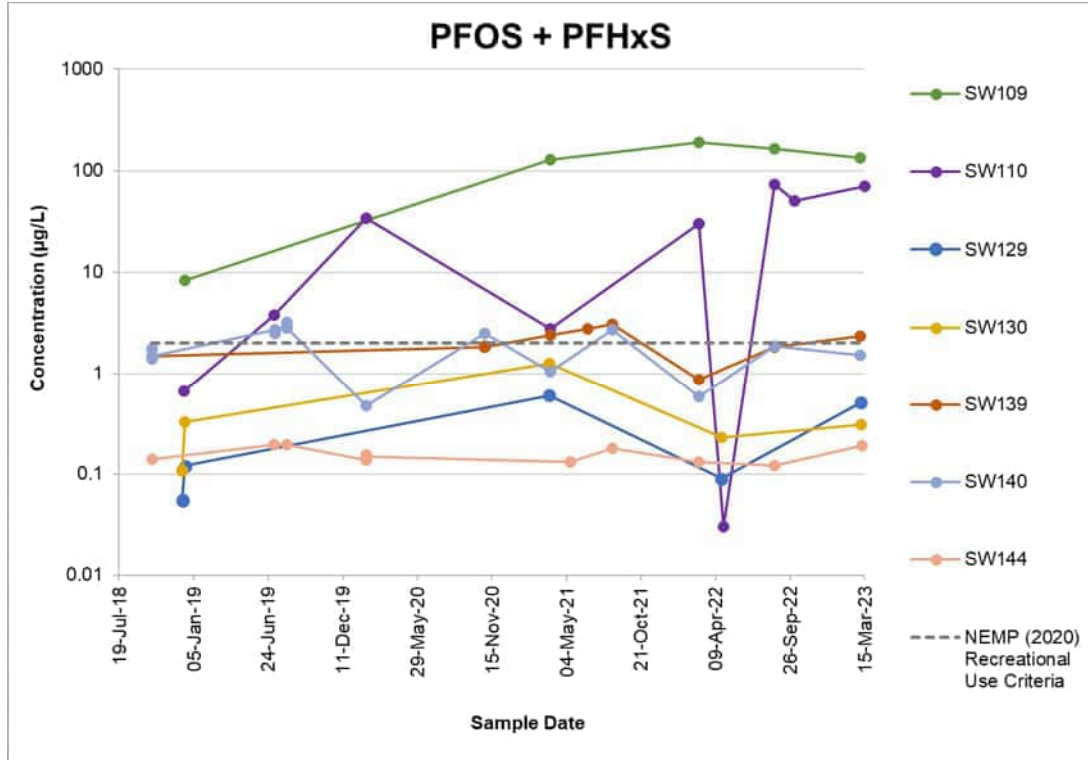


Plate 21 PFOS + PFHxS Concentrations

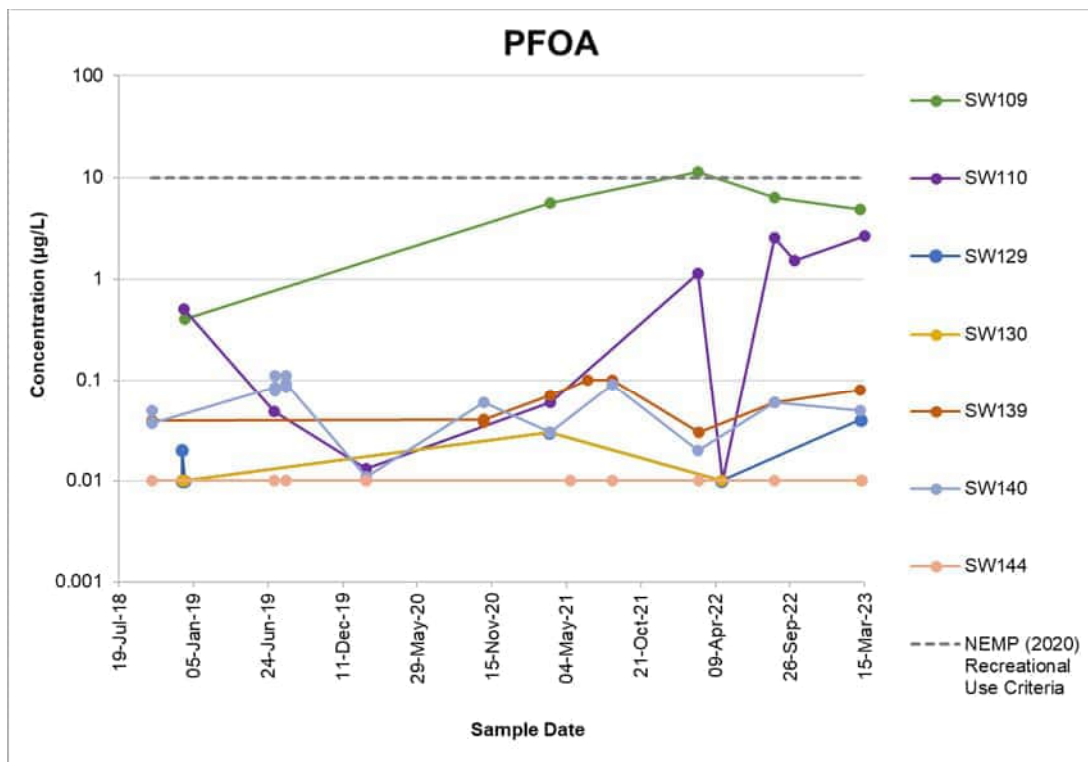


Plate 22 PFOA Concentrations

2.2.2 Base Boundary

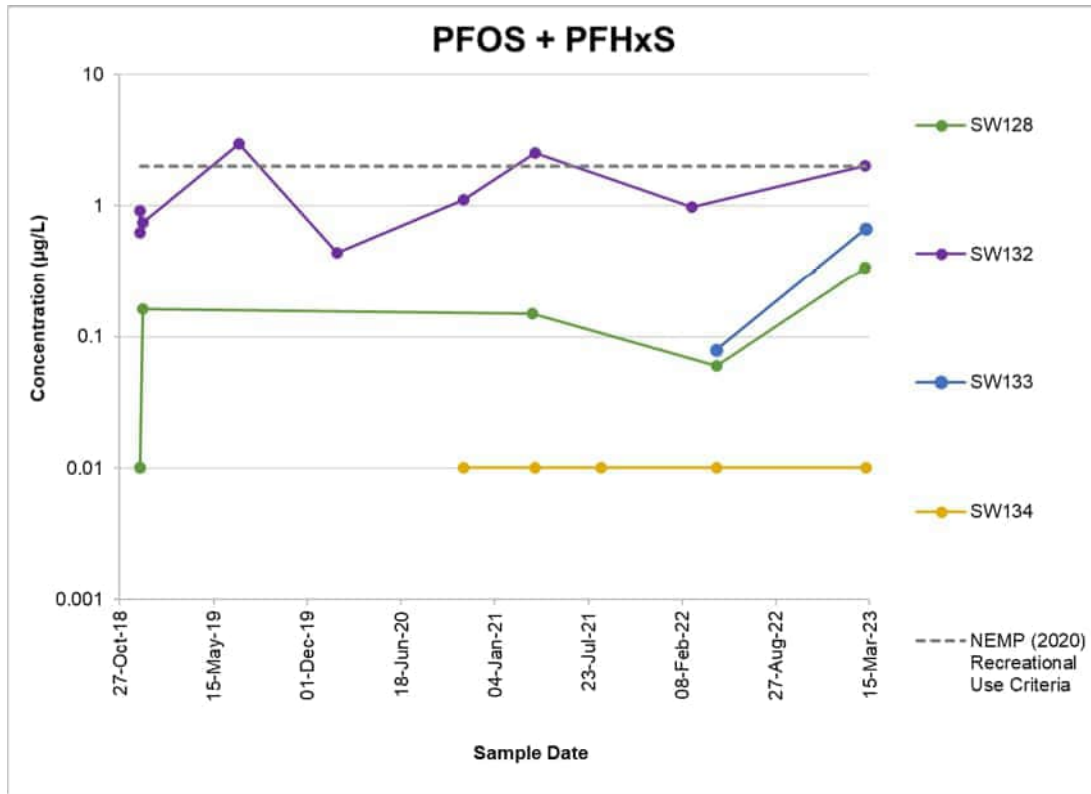


Plate 23 PFOS + PFHxS Concentrations

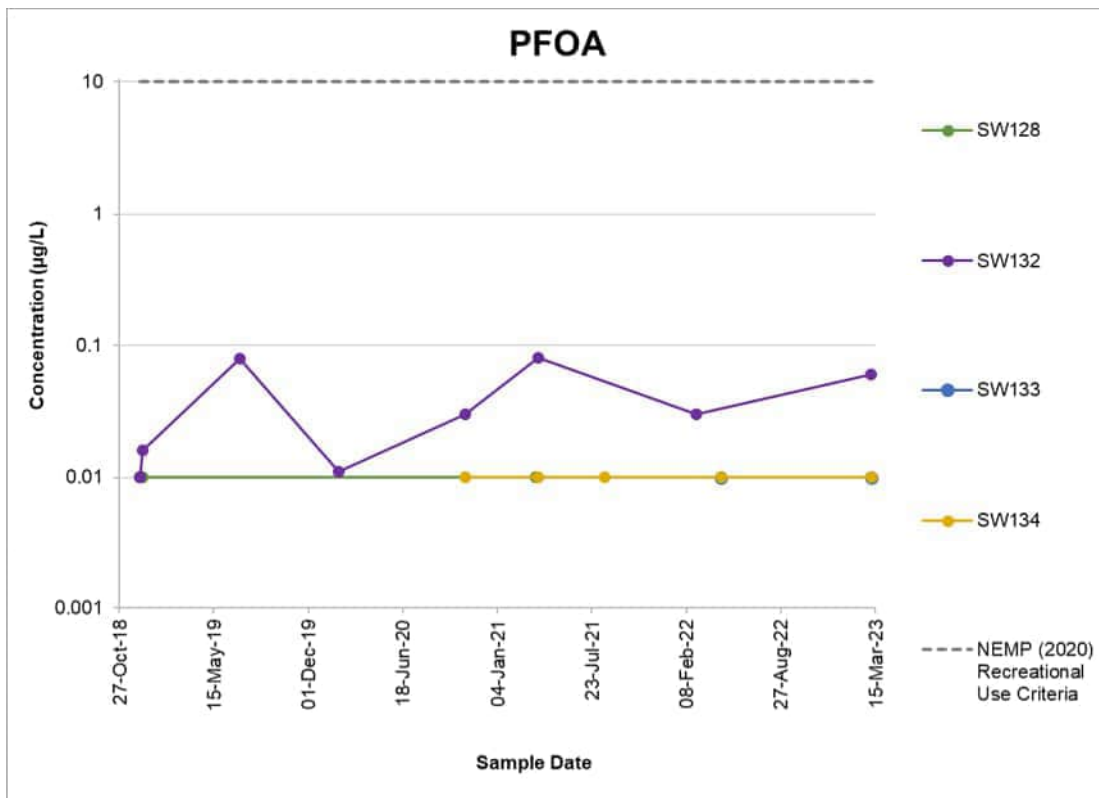


Plate 24 PFOA Concentrations

2.2.3 Off-Base Management Area

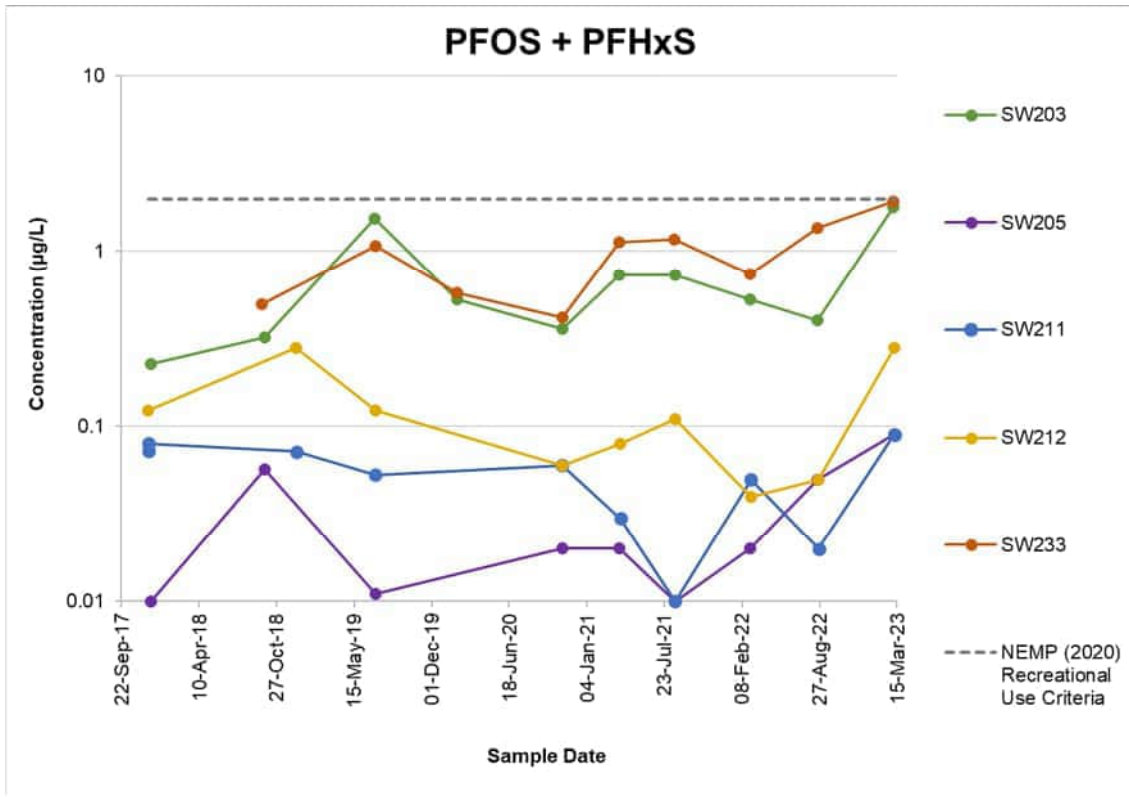


Plate 25 PFOS + PFHxS Concentrations

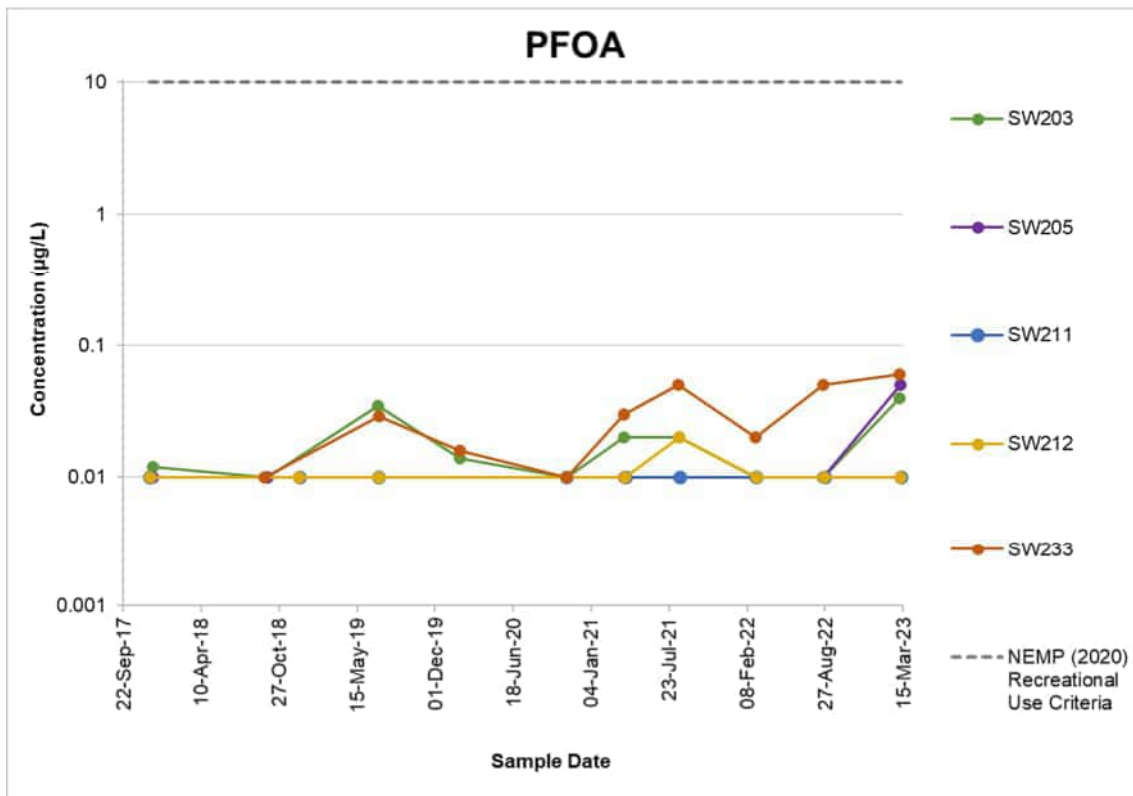


Plate 26 PFOA Concentrations

2.3 J/K and East Sub-Catchment

2.3.1 Source area/area of interest

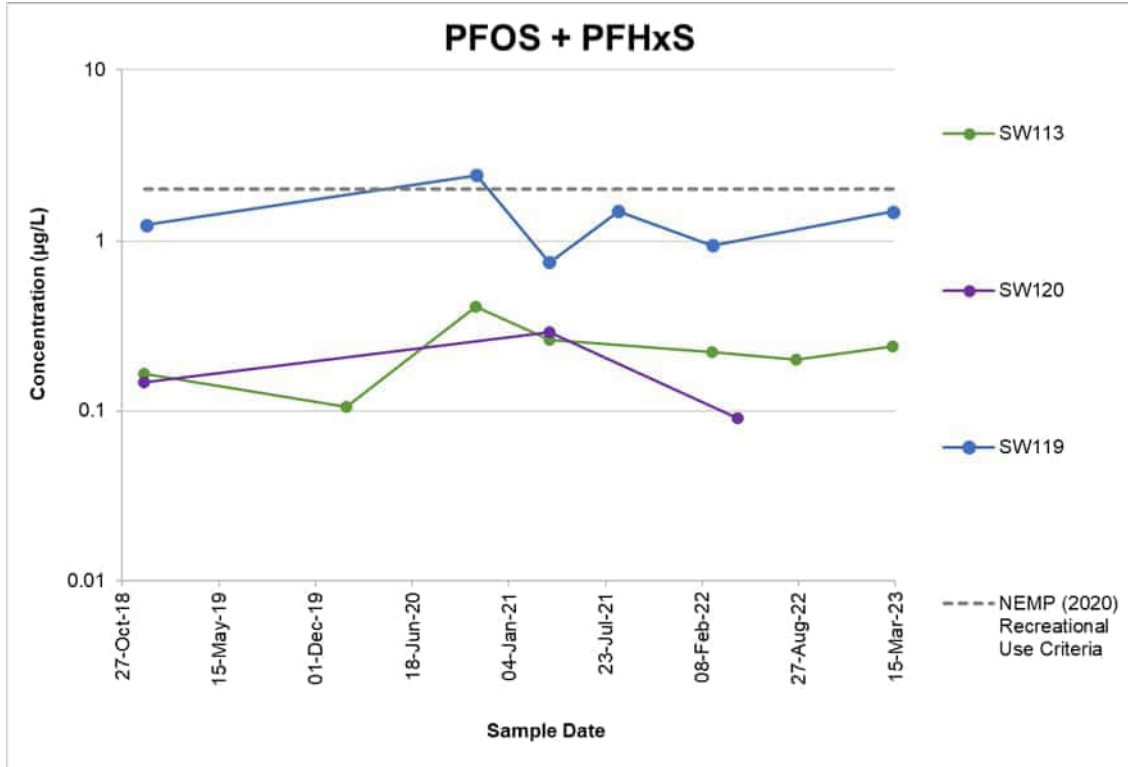


Plate 27 PFOS + PFHxS Concentrations

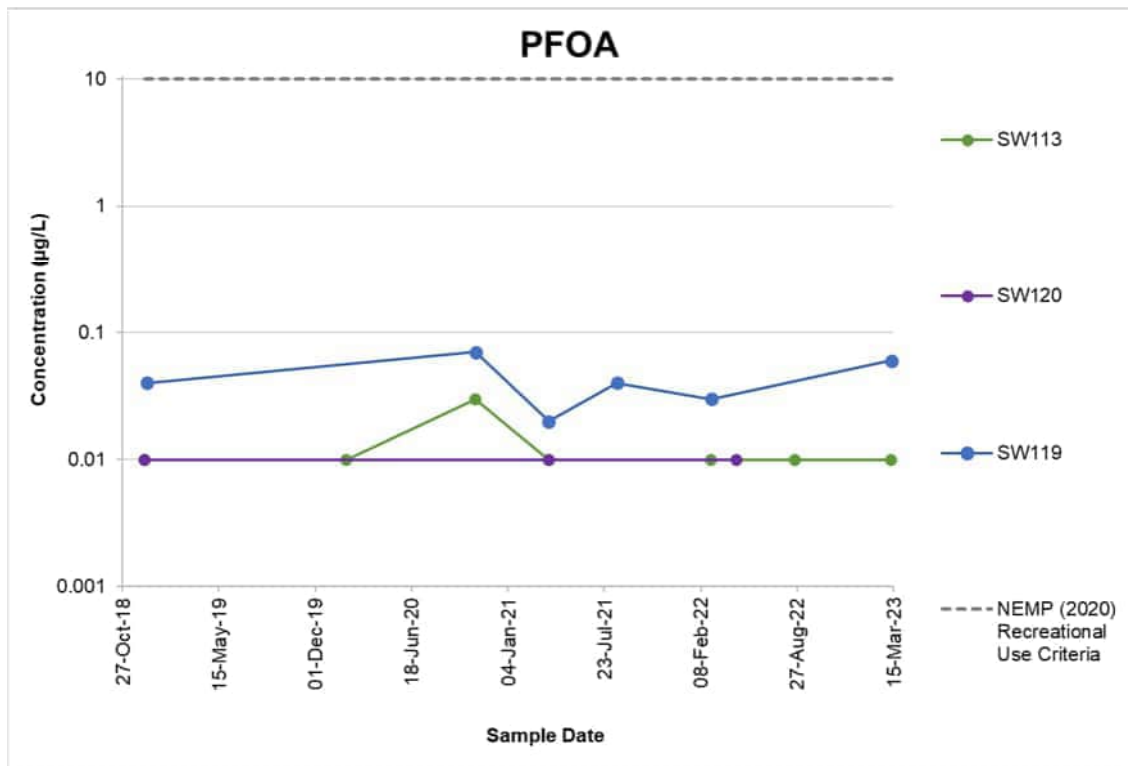


Plate 28 PFOA Concentrations

2.3.2 Base Boundary

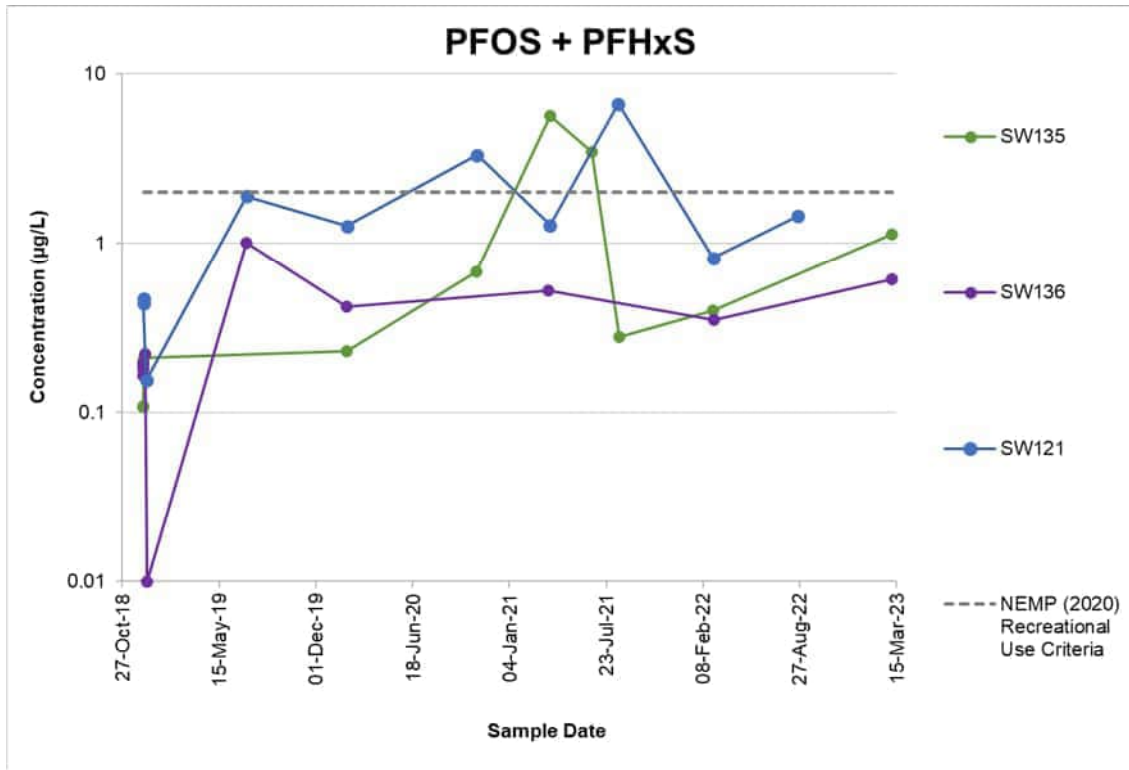


Plate 29 PFOS + PFHxS Concentrations



Plate 30 PFOA Concentrations

2.3.3 Off-Base Management Area

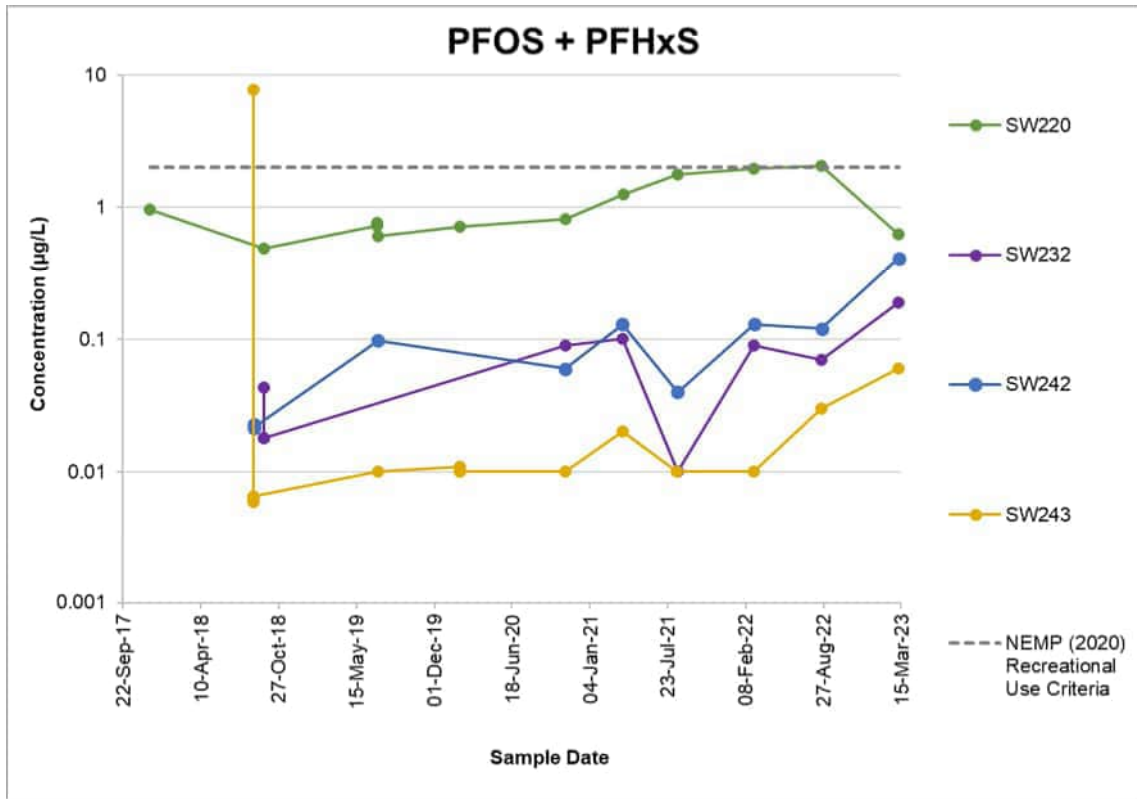


Plate 31 PFOS + PFHxS Concentrations



Plate 32 PFOA Concentrations

2.4 Ross River (Off-Base)

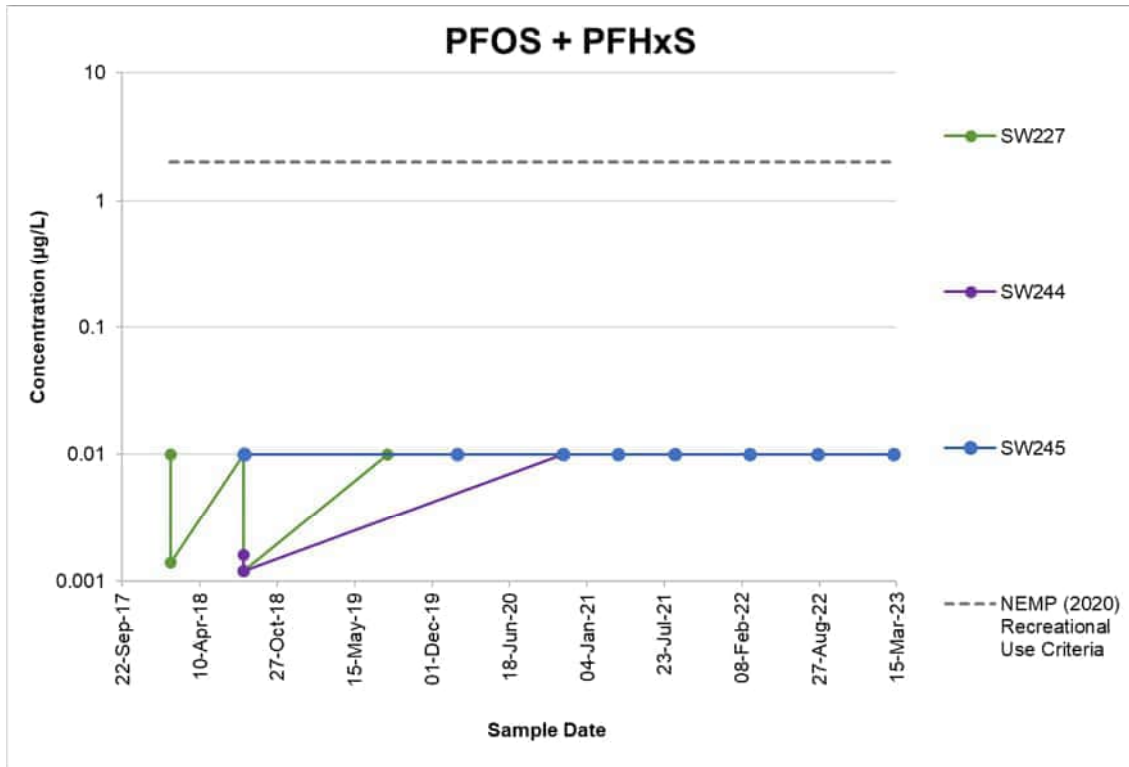


Plate 33 PFOS + PFHxS Concentrations

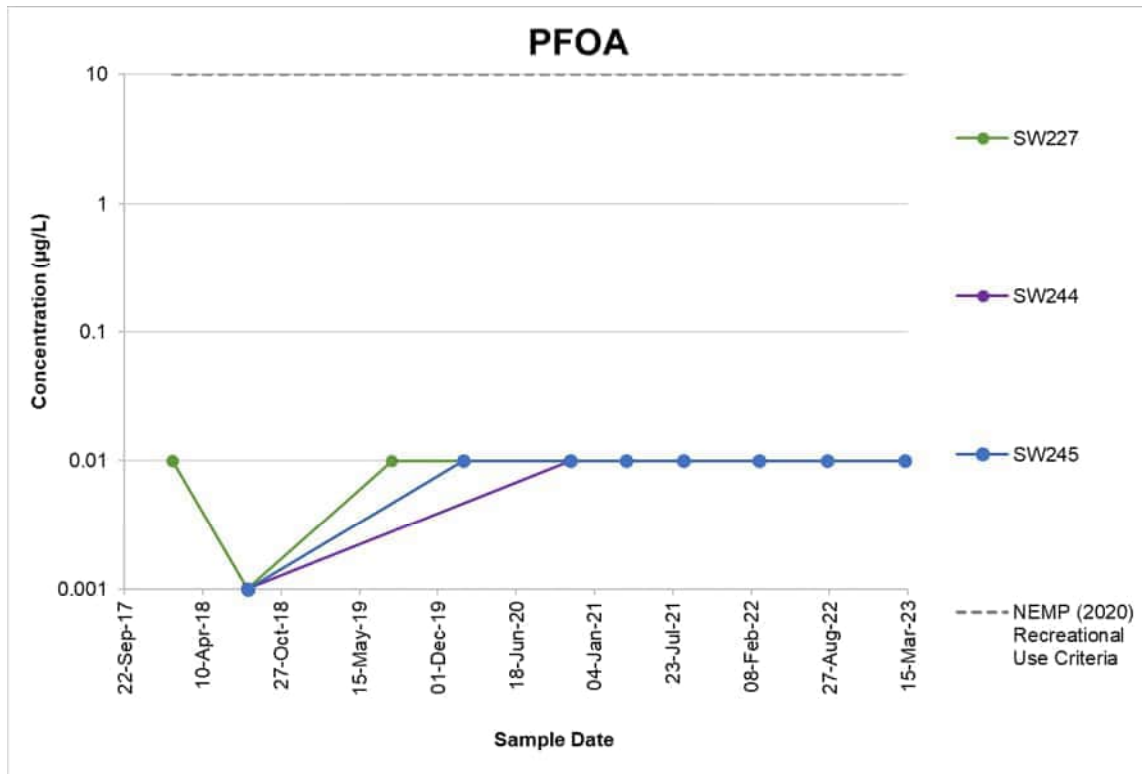


Plate 34 PFOA Concentrations

Appendix D

SAQP

PFAS OMP Lavarack Barracks

Sampling and Analysis Quality Plan

23-Feb-2023
PFAS Ongoing Monitoring Program
Doc No. 60612487_RP15_20230223_7
Commercial-in-Confidence

AECOM

PFAS Ongoing Monitoring Program
PFAS OMP Lavarack Barracks – Sampling and Analysis Quality Plan
Commercial-in-Confidence

PFAS OMP Lavarack Barracks

Sampling and Analysis Quality Plan

Client: Department of Defence - Environment and Engineering Branch, Directorate of PFAS Remediation (DPFASR)

ABN: 68 706 814 312

Prepared by

AECOM Australia Pty Ltd

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1.0 Introduction

1.1 Preamble

AECOM Australia Pty Ltd (AECOM) has prepared this Sampling and Analysis Quality Plan (SAQP) for the per- and poly-fluoroalkyl substances (PFAS) Ongoing Monitoring Program at Lavarack Barracks (the “Base”) and the Lavarack Barracks Management Area in the North Queensland Region, as defined in the *PFAS Management Area Plan (PMAP)*, (Department of Defence, 2020).

The SAQP supports the *PFAS Ongoing Monitoring Plan (OMP)* which was included in the *Lavarack Barracks PFAS Management Area Plan (PMAP)*.

The purpose of the OMP is to collect data to enable Defence to maintain an up to date understanding of the distribution, concentration and transport (migration pathways and flow) of PFAS at the Base and within the Management Area. The data will assist in the timely identification of risks and inform Department of Defence’s (Defence) approach to the management of PFAS, including updates and revisions to the PMAP.

1.2 SAQP Objectives

The objectives of this SAQP are to:

- Define the proposed scope of works in detail;
- Outline the proposed sampling methodology to be adopted;
- Outline the proposed data quality assurance and quality control (QA/QC) measures to be adopted; and
- Define the data collection requirements for the project.

1.3 Scope of Works

To meet the project objectives, the following scope of works are proposed as per the OMP for Lavarack Barracks (Department of Defence, 2020):

- Annual post-wet season sampling event March/April 2021, February/March 2022 and February/March 2023 including:
 - Groundwater sampling of 38 monitoring wells within the Management Area; and
 - Surface water sampling at 31 locations (provided water is present), co-located with sediment sampling within the Management Area.
- post-dry season sampling event in October 2020, August 2021 and August/September 2022 including:
 - Groundwater sampling of 38 monitoring wells; and
 - Surface water sampling at 31 locations (provided water is present), co-located with sediment sampling within the Management Area.
- Preparation of reports including a sampling event factual report (following each biannual sampling event) and annual interpretative reports following the completion of each 12-month sampling period.
- The sampling locations are presented in **Appendix A**.

1.4 Guidelines and Legislation

The SAQP has been developed with reference to the following guidelines and legislation:

- PFAS National Environmental Management Plan (NEMP) 2.0, Heads of Environmental Protection Agencies (HEPA), 2020.

- National Environment Protection (Assessment of Site Contamination) Measure (NEPM), National Environment Protection Council (NEPC), 2013.
- Commonwealth of Australia Department of Defence, Routine Environment Water Quality Monitoring Manual, 2018.
- Commonwealth of Australia Department of Defence, Contamination Management Manual (DCMM), 2018 amended June 2021.
- Department of Health (DoH), Health Based Guidance Values for PFAS for use in site investigations in Australia, September 2019.
- National Health and Medical Research Council (NHMRC), Guidance on PFAS in Recreational Water. August 2019.
- Standards Australia 1998, reconfirmed in 2016. AS/NZ 5667:1998 Water Quality – Sampling.
- Australian and New Zealand Guidelines, 2018. Australian and New Zealand Guidelines for Fresh and Marine Water Quality.
- Environmental Protection (Water and Wetland Biodiversity) Policy 2019.

2.0 Site Identification and Conceptual Site Model

2.1 The Base and Management Area

Lavarack Barracks is located in Townsville, North Queensland. The Base covers an area of approximately 740 hectares (ha) and is a large working, training, and accommodation facility, which houses the Australian Army 3rd and 11th Brigades. The Base contains numerous workshops, washdown bays, interceptor pits, battery storage areas, bulk fuel area/ oil storage and distribution facilities (Department of Defence, 2020).

The Management Area is defined by the Ross River (to the north), sub catchment to the east and west and Mount Stuart to the south. The Management Area includes surrounding the residential suburbs of Murray, Douglas, Annandale, Idalia, Onoonba and Wulguru, as shown in **Appendix B**.

2.2 Conceptual Site Model

The conceptual site model (CSM) for the Base and Management Area is presented in the Detailed Site Investigation (RPS/Wood, 2019) and referenced in the OMP which summarises the linkages between sources, pathways and receptors.

3.0 Data Quality Assessment

3.1 Data Quality Objectives

The amended National Environmental Protection Measure (NEPM, Schedule B [2]) Guideline on Site Characterisation (2013) specifies that the nature and quality of the data produced in an investigation will be determined by the Data Quality Objectives (DQOs). As referenced by the NEPM, the DQO process is detailed in the United States Environmental Protection Agency (US EPA) *Guidance on Systematic Planning Using the Data Quality Objectives Process (EPA QA/G-4: EPA/240/B-06/001), February 2006*.

The US EPA defines the process as ‘a strategic planning approach based on the Scientific Method that is used to prepare for a data collection activity. It provides a systematic procedure for defining the criteria that a data collection design should satisfy, including when to collect samples, where to collect samples, the tolerable level of decision errors for the study, and how many samples to collect’.

The process of establishing appropriate DQOs is defined according to the following seven steps:

Table 1 The seven steps in defining DQOs

Step	Data Quality Objective Step
1	State the problem – Define the problem that necessitates the study; identify the planning team, examine budget, schedule.
2	Identify the goal of the study – State how environmental data will be used in meeting objectives and solving the problem, identify study questions, define alternative outcomes.
3	Identify information inputs – Identify data and information needed to answer study questions.
4	Define the boundaries of the study – Specify the target population and characteristics of interest, define spatial and temporal limits, scale of inference.
5	Develop the analytic approach – Define the parameter of interest, specify the type of inference, and develop the logic for drawing conclusions from findings.
6	Specify performance or acceptance criteria – Develop performance criteria for new data being collected or acceptable criteria for existing data being considered for use.
7	Develop the plan for obtaining data – Select the resource-effective sampling and analysis plan that meets the performance criteria.

The approach adopted relative to the seven steps presented above is discussed below.

3.1.1 Step 1 – State the Problem

Defence and State agencies require up-to-date data to enable informed risk management decisions to protect human health and the environment, given that elevated concentrations of PFAS have been identified in environmental media. The primary pathway for the migration of PFAS off-Base is considered to be overland flow via surface drainage channels during seasonal rain events. Migration of PFAS from soils and surface water on-Base, to groundwater (via leaching / infiltration) and the subsequent transport downgradient as a plume via coarser grained sediments associated with paleochannels of the Ross River has also been identified as a potential pathway for off-Base migration of PFAS (Department of Defence, 2020).

Defence requires an understanding of the holistic effect of PFAS management response activities that have and will be implemented. The transport mechanisms for migration of PFAS are heavily influenced by seasonal variations and the SAQP sampling reflects the need to account for this seasonality.

The data collected by this SAQP will provide a detailed dataset that can be used to assist with assessment of temporal changes in PFAS concentrations in groundwater and surface water/sediment on-Base and off-Base. This will facilitate refinement of the CSM and associated risk, allow update of the

human health and ecological risk assessment and inform management decisions by Defence and government agencies.

3.1.2 Step 2 – Identify the Goal of the Study

The overall goal of the study is to establish a systematic routine groundwater and surface water/sediment sampling and analysis program which accounts for seasonal variations, to provide current and ongoing information on the distribution and migration of PFAS contaminants of potential concern in groundwater and surface water/sediment in the Management Area.

Specific goals of the program are to:

- Understand the changes and trends in the nature, extent and magnitude of PFAS concentrations in the groundwater, surface water and sediment within the Management Area between wet and dry season conditions;
- Understand if the nature, extent and magnitude of PFAS concentrations have changed significantly to warrant a revision to the human health and environmental risk assessments; and
- Understand if the nature, extent and magnitude of PFAS concentrations have changed significantly to warrant refinement of any existing management measures.

The decisions to be made based on the results of the investigation are:

- Do the analytical results and field observations allow for an assessment of risk(s) associated with complete or potentially complete PFAS source-pathway-receptor pathways?
- Do the analytical results and field observations allow for the interpretation of PFAS trends and do these trends warrant a re-evaluation of management actions?
- Does the OMP need to be refined to address uncertainty and would such a change(s) result in greater efficacy with respect to ongoing management or future intervention.

Note: a single trigger value for the reassessment of risk is not considered appropriate for the Management Area and a weight of evidence approach is to be adopted for reassessment of risk.

3.1.3 Step 3 – Identify Information Inputs

To allow assessment of the data against the study goal listed in Step 2 above, the following inputs will be considered:

- Physical setting of the Base;
- PFAS results, water levels and field observations from previous investigations;
- Meteorological data including rainfall;
- Field observations;
- Groundwater, sediment and surface water data collected and analysed for PFAS to assess the distribution and extent of PFAS, as part of this SAQP;
- Groundwater and surface water elevation data;
- Fate and transport mechanisms and behaviour of PFAS in the environment;
- Screening criteria (refer **Section 4.10**);
- Statistical analysis to identify trends;
- Advances in laboratory analytical approaches and changes in regulatory requirements; and
- Recommendations made in the preceding Sampling Event Factual Reports completed by AECOM:
 - Sampling Event Factual Report, October 2020- PFAS Ongoing Monitoring Program- Lavarack Barracks, Townsville, QLD (AECOM, 2021a).
 - Sampling Event Factual Report, March/April 2021 - PFAS Ongoing Monitoring Program- Lavarack Barracks, Townsville, QLD (AECOM, 2021b).

- Sampling Event Factual Report, August 2021 - PFAS Ongoing Monitoring Program- Lavarack Barracks, Townsville, QLD (AECOM, 2021c).
- Sampling Event Factual Report, March/April 2022 - PFAS Ongoing Monitoring Program- Lavarack Barracks, Townsville, QLD (AECOM, 2022).

3.1.4 Step 4 – Define the Boundaries of the Study

The spatial and temporal boundaries that apply for data collection are detailed below and will influence the decision-making process for ongoing monitoring:

- The spatial boundary for data collection and decision making is the Base and the wider Management Area. Three sampling locations are located in the Ross River to assist determination of base load of PFAS in Ross River. Refer to **Appendix A** for all sampling locations.
- The sampling completed as part of the SAQP includes groundwater, sediment and surface water, at the frequencies defined in **Section 4.3** to account for seasonality.
- The monitoring will be undertaken initially for three years (as outlined in the OMP, Department of Defence, 2020) followed by a review to assess the need for ongoing monitoring.

The SAQP will also cover the initial implementation period of the OMP (Department of Defence, 2020). The SAQP will also cover the extent required by specific characteristics of the Base and surrounds, and behaviour of the plume, measured against specified data trends.

3.1.5 Step 5 – Develop the Analytical Approach

The decision rules can be defined as:

- Analytical selection; all samples will be analysed for the extended PFAS suite.
- Analytical method selection for PFAS is based on achieving appropriate laboratory limit of reporting (LOR) in the various media to be analysed. Standard LORs will be used for the OMP Implementation.
- Sample locations have been selected with the objective of monitoring PFAS trends (temporal and seasonal), providing early warning of changes in the migration of PFAS in surface water and groundwater.
- If the laboratory quality assurance/quality control data are within the acceptable ranges, the data will be considered suitable for use.
- If PFAS concentrations are reported above the laboratory LOR, where it was previously <LOR, then it will be considered whether further assessment of the data is required.
- If PFAS is reported at a concentration that is consistently above the adopted screening criteria, then it will be considered that further assessment is required.
- If PFAS is reported at a concentration that is inside a trigger value or acceptable range, then it will be considered whether monitoring is continued or reduced, this assessment will be undertaken after three years of monitoring.

The decision on the acceptance of the analytical data will be made on the basis of the Data Quality Indicators (DQIs) as follows:

- **Precision:** A quantitative measure of the variability (or reproducibility) of data.
- **Accuracy:** A quantitative measure of the closeness of reported data to the “true” value.
- **Representativeness:** The confidence (expressed qualitatively) that data are representative of each media present on site.
- **Completeness:** A measure of the amount of useable data from a data collection activity.
- **Comparability:** The confidence (expressed qualitatively) that data may be considered to be equivalent for each sampling and analytical event.

Table 2 provides further specific details.

3.1.6 Step 6 – Specify Performance or Acceptance Criteria

Specific limits for the works included in the OMP (Department of Defence, 2020) are in accordance with the appropriate guidance made or endorsed by state and national regulations, appropriate indicators of data quality, and standard procedures for field sampling and handling.

This step also examines the certainty of conclusive statements based on the available new data collected. This should include the following points to quantify tolerable limits:

- A decision can be made based on a certainty assumption of 95% confidence in any given data set. A limit on the decision error will be 5% that a conclusive statement may be a false positive or false negative.
- A decision error in the context of the decision rule presented above would lead to either underestimation or overestimation of the risk level associated with a particular sampling area.
- Sampling errors may occur when the sampling program does not adequately detect the variability of a contaminant from point to point across the Base. To address this, the OMP outlines minimum numbers of samples proposed to be collected from each media.
- As such, there may be limitations in the data if aspects of the OMP cannot be implemented. Some examples of this scenario include but are not limited to:
 - Proposed surface water sample locations may be dry at the time of sampling.
 - Proposed groundwater well locations are damaged or destroyed and therefore cannot be sampled.
 - Proposed samples are not collected due to access being restricted to a given location.
- Measurement errors can occur during sample collection, handling, preparation, analysis and data reduction. To address this the following measures are proposed:
 - Collection of sufficient sample mass to facilitate analysis reported to standard laboratory detections limits. Collection of insufficient sample mass may result in raised detection limits.
 - Field staff to follow a standard procedure when collecting samples, including decontamination of tools, and use of appropriate sample containers and preservation methods.
 - Laboratories to follow a standard procedure when preparing samples for analysis and undertaking analysis. LOR may be increased for saline samples due to matrix interference for higher salinity samples.
 - Laboratories to report quality assurance/ quality control data for comparison with the DQIs established for the SAQP.
- **Table 2** provides acceptance criteria.

3.1.7 Step 7 – Optimise the Design for Obtaining Data

The methodology presented in this SAQP is designed to meet the project objectives described in **Section 1.2** and to achieve the nominated DQOs. Optimisation of the data collection process will be achieved by:

- Working closely with the analytical laboratories and sampling equipment suppliers to ensure that appropriate procedures and processes are developed and implemented prior to and during the fieldwork, to ensure that sample handling, and transport to and processing by the analytical laboratories is appropriate.
- Conducting sampling according to Defence and Australian Standards for the type of sampling being conducted (i.e. groundwater monitoring well sampling versus landholder bore water sampling). These standards are as follows:
 - Department of Defence (March 2018, Amended June 2021), *Contamination Management Manual*.
 - Standards Australia (AS/NZS5667.11–1998) *Water Quality – Sampling, part 11: Guidance on sampling of groundwater*.

- Standards Australia (AS 4482.1-2005) *Guide to the sampling and investigation of potentially contaminated soil. Part 1: Non-volatile and semi-volatile compounds.*
- Standards Australia (AS 4482.2-1999) *Guide to the sampling and investigation of potentially contaminated soil, Part 2: Volatile Substances.*
- Conducting sampling in accordance with AECOM's internal PFAS Sample Collection Guidance.
- Sampling conducted by suitably qualified and experienced field staff.
- Basing the sampling upon a CSM developed using the information available at the implementation of the SAQP. Updating the CSM as new data becomes available in the course of the implementation of the SAQP, as required; and
- Progressive review of the data throughout the initial three-year OMP period and modification of sampling programs to optimise the value of data generated.

If the objectives of the SAQP are not being met, the sampling design and approach will be reviewed and amended, as required.

3.2 Assessment of Data Quality

The quality of data collected as part of the sampling will be assessed on a range of factors including:

- Documentation and data completeness; and
- Data quality – comparability, representativeness, precision and accuracy of the analytical data.

The project target for data completeness is to achieve 95% of data as suitable for use.

The acceptance criteria for DQIs for samples are specified in **Table 2**.

Table 2 Acceptance Criteria for Data Quality Indicators for Sample Analysis

Data Quality Indicators	Acceptance Criteria
Water and Sediment Samples	
Rinsates (where sampling equipment is reused)	Less than the laboratory LOR.
Field duplicates/Inter-lab duplicates	The relative percentage difference (RPD)s will be assessed as acceptable if less than or equal to 30% as per the NEPM Schedule B3. Where the results shows greater than 30% difference a review of the cause will be conducted (NEPM, 2013). It is noted that RPDs that exceed this range may be considered acceptable where: <ul style="list-style-type: none"> • Results are less than 10 times the LOR (no limit); • Results are less than 20 times the LOR and the RPD is less than 50%; and • Heterogeneous materials are encountered.
Laboratory duplicates	RPDs less than: <ul style="list-style-type: none"> • 20% for high level laboratory duplicates (i.e. >20 x LOR); and • 50% for medium level laboratory duplicates (i.e. 10 to 20 x LOR).
Matrix spikes	Recoveries between 70-130% of the theoretical recovery or as nominated in the laboratory's QC report, based on their historical database.
Method blanks	Less than the laboratory LOR.
Laboratory control samples	Recoveries between laboratories specified range for each particular analyte/analytical suite.

4.0 Sampling Location Rationale and Methodology

4.1 OMP

The OMP (Department of Defence, 2020) presents an overview of specific monitoring works to be undertaken and provides the basis for the preparation of this SAQP. The scope of works presented in this SAQP is consistent with that detailed in the OMP.

4.2 Proposed Schedule

4.2.1 Sampling Events

Groundwater, sediment and surface water sampling across the Management Area will be performed biannually with wet season sampling in February/March and a dry season sampling in August/September for an initial period of three years, with the initial sampling event completed in October 2020. In the event that the wet season is delayed, the sampling round will be conducted in March/April.

The proposed schedule of fieldworks across the initial three-year period is presented in **Table 3** below.

Table 3 Proposed Fieldwork Schedule

Sampling Round No.	Description of works	Proposed Schedule
1	Dry season groundwater, sediment and surface water sampling	October 2020
2	Wet season groundwater, sediment and surface water sampling	March/April 2021
3	Dry season groundwater, sediment and surface water sampling	August 2021
4	Wet season groundwater, sediment and surface water sampling	February/March 2022
5	Dry season groundwater, sediment and surface water sampling	August/September 2022
6	Wet season groundwater, sediment and surface water sampling	February/March 2023

4.3 Sample Location Rationale

4.3.1 Groundwater Sampling Locations Rationale

There are 38 groundwater monitoring wells identified for ongoing monitoring. These wells are located across the Base, Base boundary, Townsville City Council controlled public spaces, and one location on a private property. Stakeholder permission is required to access and sample MW226. No formal permits are required for collection of environmental samples under this SAQP.

The rationale for monitoring well selection for each area is summarised in **Table 4**.

Table 4 Rationale for Groundwater Monitoring Locations

Area	Rationale
On-Base	Sampling points have been selected both within and down-gradient of the identified source areas, to monitor the change in PFAS concentrations at each source area and confirm the level of risk identified in the DSI.
Base Boundary	The Base boundary sampling points act as 'sentinels' for potential changes in PFAS concentrations in ground water in the Off-Base Management Area. These points are considered critical to the understanding of risk to sensitive receptors in the Off-Base Management Area.
Off-Base	<ul style="list-style-type: none"> Sampling locations within the Off-Base Management Area have been selected to assess the key PFAS migration pathways. Confirm the understanding of risk and provide additional data points for use in determining both seasonal and longer-term trends in PFAS migration via pathways identified during the DSI.

4.3.2 Groundwater Gauging Locations

All locations are proposed to be gauged prior to each sampling event and are presented in **Figure 1**, in **Appendix A**.

4.3.3 Groundwater Sampling Locations

The groundwater locations to be monitored as part of the wet and dry season sampling events are provided in Table 5 below and are presented in **Figure 1**, in **Appendix A**. Stakeholder access permission in the form of a Training Area Safety and Management Information System booking with Mount Stuart Training Area Range Control is required for access to MW124, MW125I, MW125S.

Table 5 Groundwater sampling locations

Management/Source Area	Wells	Number of wells
Eastern PFAS Contamination Area	MW018, MW114, MW115, MW116, MW139	5
Former B Squadron	MW135	1
Former Fire Training Area	MW105, MW128, MW131	3
Former Helicopter Squadron	MW102	1
Lavarack Golf Course & Sporting Field	MW065, MW120, MW121, MW122, MW123S, MW123I	6
Monocell	MW072 ¹ , MW074 ¹ , MW106	3
Stockpile Designated Area 2	MW141	1
Suspected AFFF Disposal Area	MW101	1
Top, Middle and Lower Dams	MW138	1
Base Boundary	MW002 ¹ , MW003 ¹ , MW118 ¹ , MW119 ¹ , MW124, MW125I, MW125S	7
Off-Base	MW205S, MW212, MW217, MW220S, MW226, MW232, MW233, MW235S, MW236S	9
	Total	38

¹ Locations conflicting with the Water Quality Monitoring Program

4.3.4 Sediment Sampling Locations Rationale

The sediment locations to be monitored as part of the wet and dry season sampling events are provided in **Table 6** below and are presented in **Figure 2, Appendix A**. Stakeholder access permission is required to access and sample SW/SD211 and SW/SD212 which are located on private property. These locations have been selected to maintain consistency with the recent monitoring completed within the Management Area.

4.3.5 Sediment Sampling Locations

Table 6 Sediment sampling locations

Management/Source Area	Sampling locations	Number of locations
Eastern PFAS Contamination Area	SD119, SD121	2
Former Fire Station	SD109, SD110	2
Lavarack Golf Course & Sporting Field	SD129, SD130	2
Top, Middle and Lower Dams	SD139, SD140, SD144	3
On-Base Balance	SD113, SD120	2
Base Boundary	SD126, SD128, SD132, SD133, SD134, SD135, SD136	7
Off-Base	SD203, SD205, SD211, SD212, SD217, SD220, SD227, SD232, SD233, SD242, SD243, SD244, SD245	13
Total		31

4.3.6 Surface Water Sampling Locations Rationale

The surface water locations to be monitored as part of the wet and dry season sampling events are provided in **Table 7** below and are presented **Appendix A, Figure 2**. Stakeholder access permission is required to access and sample SW/SD211 and SW/SD212 which are located on private property. These locations have been selected to maintain consistency with the recent monitoring completed within the Management Area. Surface water locations are co-located with sediment sampling locations, and surface water will be collected where present.

4.3.7 Surface Water Sampling Locations

Table 7 Surface water sampling locations

Management/Source Area	Sampling locations	Number of locations
Eastern PFAS Contamination Area	SW119, SW121	2
Former Fire Station	SW109, SW110	2
Lavarack Golf Course & Sporting Field	SW129, SW130	2
Top, Middle and Lower Dams	SW139, SW140, SW144	3
On-Base Balance	SW113, SW120	2
Base Boundary	SW126, SW128, SW132, SW133, SW134, SW135, SW136	7
Off-Base	SW203, SW205, SW211, SW212, SW217, SW220, SW227, SW232, SW233, SW242, SW243, SW244, SW245	13
Total		31

4.4 Sample Collection and Handling

4.4.1 Groundwater Sampling

The groundwater sampling methodology and schedule are presented in **Table 8**.

Table 8 Groundwater sampling methodology and schedule

Item	Details
Groundwater gauging	<p>The depth to groundwater will be measured at the beginning of each sampling round, commencing with on Base wells and moving to off-Base locations and finishing with tidally influenced wells along Ross River and Idalia Lakes. All wells associated with the OMP are proposed to be gauged within the same day.</p> <p>Groundwater wells will also be gauged immediately prior to the collection of groundwater samples.</p>
Sample Collection Methodology	<p>Groundwater samples will be collected from all monitoring wells using no-purge methodology HydraSleeves™, which will be installed within the screened interval of the wells approximately 1 m above the base of the well for a minimum of 24 hours prior to the sampling round. Well construction details are presented in Appendix C.</p> <p>Once sampling is completed, new HydraSleeves™ will not be redeployed due to conflicts with other monitoring programs, potential presence of tree roots and loss of sampling equipment over the life of the program. Instead, HydraSleeves™ will be deployed during the gauging round at the beginning of the program and collected following a period of no less than 24 hours. A decontaminated steel bailer is to be used where insufficient water volume is able to be collected using HydraSleeves™.</p>
Field Parameters	<p>Temperature, electrical conductivity (EC), dissolved oxygen (DO), oxidation reduction potential (ORP), pH and observations of water quality will be recorded for all groundwater samples.</p>
Sampling Schedule	<p>The monitoring across the investigation area will include two sampling events, as detailed below:</p> <p>Wet Season: 38 monitoring wells across the Base and surrounding areas. Dry Season: 38 monitoring wells across the Base and surrounding areas.</p>

4.4.2 Sediment Sampling

The sediment sampling methodology and schedule are presented in **Table 9**.

Table 9 Sediment sampling methodology and schedule

Item	Details
Sample Collection Methodology	Samples representative of potentially deposited sediments will be collected from within the water body if possible. Sediment samples will be collected using a trowel or gloved hand, where possible, or a sludge and sediment sampler. At each location, a new laboratory supplied container will be used for each sample.
Sampling Schedule	Sediment sampling will be conducted at 31 locations during both the wet and dry season sampling events.

4.4.3 Surface Water Sampling

The surface water sampling methodology and schedule are presented in **Table 10**.

Table 10 Surface water sampling methodology and schedule

Item	Details
Sample Collection Methodology	Samples to be collected from immediately below the water surface to minimise collection of sediment or floating materials in the samples. At each location, a new, laboratory supplied container will be lowered into the water with the cap immediately applied once the container is full. Where the waterway cannot be accessed from the bank a telescopic sampler with a stainless-steel scoop will be used to collect the sample. Where required, a boat will be used to access some locations of the Ross River. The sample will then immediately be transferred into the new laboratory supplied container.
Field Parameters	Temperature, EC, DO, ORP, pH and observations of water quality will be recorded for all surface water samples.
Sampling Schedule	Surface water sampling will be conducted at 31 locations during both the wet and dry season sampling events. Samples collected will depend on the availability of water within the waterway.

4.4.4 Laboratory Analysis and Quality Assurance/Quality Control Sampling

The following QA/QC sampling and laboratory analysis will be conducted for all samples as outlined in the table below.

Table 11 Laboratory Analysis and QA/QC Sampling

Item	Details
QA/QC samples to be collected	Field QA/QC samples are to include intra-laboratory duplicate and inter-laboratory duplicate, trip blank and equipment rinsate blank (rinsate) samples. Duplicate samples are to be collected at a minimum frequency of 1 in 10 primary PFAS samples. Laboratory supplied trip blanks will be included at a rate of one per batch of samples (excluding private property sampling) and will be prepared by filling sample containers with laboratory supplied PFAS free deionised water. Rinsate samples are to be collected at a rate of one sample per day of sampling when non-dedicated equipment is used by pouring laboratory supplied PFAS free deionised water over the decontaminated sampling equipment. Additional sample volume is required to be collected to enable the appropriate laboratory QA/QC for all water samples.
Sample Analysis	All primary samples will be submitted for PFAS extended suite using the standard levels of detection.

4.4.5 Sample Handling and Transport to Laboratory

AECOM personnel will attempt to reduce heterogeneity in the sample media matrix by dividing the sample collected between primary and inter/intra-laboratory jars or bottles during sampling. All samples will be placed on ice in eskies immediately after sampling.

All samples will be kept, if possible, at or below 4°C during transit to the laboratory. Prior to sampling, assessment of the analytical holding times will be made, and the sampling planned accordingly to help ensure that holding times are not breached or are minimised as far as practicable.

Samples will be transported to the laboratory for analytical testing under standard Chain of Custody (CoC) documentation. Primary and associated duplicate QA/QC samples will be analysed by Australian Laboratory Services (ALS) Brisbane. The inter-laboratory duplicate samples will be analysed by Eurofins Environment Testing Australia Pty Ltd (Eurofins) in Brisbane.

4.5 Calibration

The water quality meter will be calibrated each day of use prior to the commencement of field activities with relevant solutions, including pH, DO, EC and ORP. The calibration will be in accordance with manufacturers' instructions or NATA publication "General Requirements for Registration: Supplementary Requirement: Chemical Testing (NATA 1993) and Technical Note N0. 19 (NATA 1994)". Where satisfactory calibration cannot be achieved, the water quality data will not be used for interpretive purposes.

Calibration details will be recorded on field sheets and included in the Sampling Event Factual Reports.

4.6 Logistics

The laboratory sample containers will be collected from the laboratory prior to the commencement of fieldwork. All primary and duplicate samples will be transported to ALS Townsville by the field team for forwarding to Brisbane. All inter-laboratory duplicate samples will be couriered directly to the secondary laboratory (Eurofins Brisbane) under a separate CoC documentation for analysis.

4.7 Analytical Suite and Laboratory Analysis Methods

4.7.1 Laboratory NATA Accreditation Details

The laboratory is required to use NATA accredited methods based on NEPM, US EPA, Table B 15 of the US Department of Defence/Department of Energy (US DOD/DoE) and American Society for Testing and Materials (ASTM) methods as appropriate.

The primary and secondary laboratories selected for this program are ALS (NATA Accreditation Number 825) and Eurofins (NATA Accreditation Number 1261), respectively.

4.7.2 Analytical Schedule

All media sampled shall be analysed for the extended PFAS suite with standard LOR as outlined in **Table 12** below.

Table 12 Sample Analytical Suite for PFAS

PFAS Group	Compound	CAS No.
Perfluoroalkyl Sulfonic Acids	Perfluorobutane sulfonic acid (PFBS)	375-73-5
	Perfluoropentane sulfonic acid (PFPeS)	2706-91-4
	Perfluorohexane sulfonic acid (PFHxS)	355-46-4
	Perfluoroheptane sulfonic acid (PFHpS)	375-92-8
	Perfluorooctane sulfonic acid (PFOS)	1763-23-1
	Perfluorodecane sulfonic acid (PFDS)	335-77-3
	Perfluorobutanoic acid (PFBA)	375-22-4

PFAS Group	Compound	CAS No.
Perfluoroalkyl Carboxylic Acids	Perfluoropentanoic acid (PFPeA)	2706-90-3
	Perfluorohexanoic acid (PFHxA)	307-24-4
	Perfluoroheptanoic acid (PFHpA)	375-85-9
	Perfluorooctanoic acid (PFOA)	335-67-1
	Perfluorononanoic acid (PFNA)	375-95-1
	Perfluorodecanoic acid (PFDA)	335-76-2
	Perfluoroundecanoic acid (PFUnDA)	2058-94-8
	Perfluorododecanoic acid (PFDoDA)	307-55-1
	Perfluorotridecanoic acid (PFTrDA)	72629-94-8
	Perfluorotetradecanoic acid (PFTeDA)	376-06-7
Perfluoroalkyl Sulfonamides	Perfluorooctane sulphonamide (FOSA)	754-91-6
	N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8
	N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2
	N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7
	N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2
	N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9
	N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6
(n:2) Fluorotelomer Sulfonic Acids	4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4
	6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2
	8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4
	10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0

The current standard laboratory limits of reporting (LOR) are described in **Table 13** below.

Table 13 Laboratory Limits of Reporting

Sample Media	Parameter	Technique/Method Reference	LOR*
Groundwater and Surface Water	Extended PFAS Suite	LC/MS-MS	0.01 – 1.0 µg/L
Sediment	Extended PFAS Suite	LC/MS-MS	0.0002 – 0.001 mg/kg

LC/MS-MS = Liquid chromatography–mass spectrometry

*LOR for Australian Laboratory Services (ALS)

4.8 Sample Nomenclature

In order to meet Defence data management requirements, a consistent sample nomenclature has been adopted for the Program. All primary samples will be labelled using the following DCMM naming convention:

PPPP_XX000_YYMMDD

[property ID]_[type of sample][THREE DIGIT sample number]_[yearmonthday]

e.g. 0229_MW001_200401

Location types and codes are prescribed by Defence and the investigation history.

Primary Sample Types/Location Codes relevant to this OMP include:

- MW = monitoring well
- SW = surface water - no depth required
- SD = sediment – no depth required as all sediment samples will be from surface.

QA/QC Samples will be labelled in accordance with the following convention:

- Duplicate: PPPP_QC1XX_YYMMDD
- Triplicate: PPPP_QC2XX_YYMMDD
- Rinsate: PPPP_QC3XX_YYMMDD
- Trip Blank: PPPP_QC5XX_YYMMDD.

4.9 Defence ESdat Requirements

Defence has contracted Earth Science Information Systems (ESclS), to provide contamination data management services through a cloud instance of its ESdat product.

All OMP field and laboratory data collected by AECOM will be uploaded, stored and managed in Defence's ESdat database in accordance with Section 6 of DCMM Annex L (Department of Defence, 2018, amended June 2021). AECOM will refer to historical investigation data to ensure consistent location codes are used to enable analysis of data trends. Where required under Annex L, non-compliant location codes will be resolved under direction from Defence.

AECOM will upload the data from each sampling event into ESdat prior to submitting the Sampling Event Factual Report.

4.10 Adopted Screening Criteria

Adopted screening criteria references national guidance in the form of the PFAS National Environmental Management Plan, Defence estate and environmental strategies, and Defence PFAS-specific strategies and guidance.

At the time of preparing this SAQP, a number of guidance documents were in circulation in Australia including:

- PFAS National Environmental Management Plan (NEMP), (HEPA 2020).
- Department of Health (DoH), 2019. Health Based Guidance Values for PFAS for use in site investigations in Australia. April 2017 [updated September 2019] (FSANZ 2017).
- National Health and Medical Research Council (NHMRC), 2019. Guidance on PFAS in Recreational Water. August 2019 (NHMRC 2019).
- National Environment Protection (Assessment of Site Contamination) Measure 1999, Schedule B1, as amended in 2013 (ASC NEPM).

The adopted PFAS screening criteria to assess the data generated as part of the OMP are presented in **Table 14** below.

Table 14 Summary of Adopted Screening Criteria

Pathway	Compound	Criteria	Comment / Reference
Human Health Receptors			
Off-Base - Drinking Water	PFOS + PFHxS	0.07 µg/L	The values are from the PFAS NEMP, 2020
	PFOA	0.56 µg/L	<i>Off-Base groundwater results will be compared to these criteria. Only surface water results from SW245 will be compared to these criteria. This is the only surface water location within the emergency drinking water supply for Townsville and is upgradient of Blacks Weir and not tidally influenced.</i>
Recreational use – surface water	PFOS + PFHxS	2 µg/L	The values are from the PFAS NEMP, 2020
	PFOA	10 µg/L	<i>All surface water and groundwater results will be compared to these criteria.</i>
Ecological Receptors			
Freshwater and marine water (95% species protection values)	PFOS	0.13 µg/L	The values are from the PFAS NEMP, 2020 <i>All surface water and groundwater results will be compared to these criteria.</i>
	PFOA	220 µg/L	

There are no current HEPA (2020) endorsed guideline values for PFAS in sediment.

4.11 Waste Management

Due to the proposed “no purge” sampling methodology, it is not anticipated that significant volumes of liquid waste would be generated that would require management or disposal.

Wastewater generated will be collected in a plastic drum for disposal by a licenced contractor disposed back to the well that it came from or discharged to ground directly adjacent to the well in grassed areas.

No waste soil will be generated due to the proposed grab sampling approach.

All consumables (i.e. HydraSleeves™, general rubbish) will be bagged and placed in general waste bins for disposal.

4.12 Quality Assurance/Quality Control Sampling

4.12.1 Field Duplicate and Inter-laboratory Duplicate Samples

Field duplicate (intra-laboratory) samples and triplicate (inter-laboratory field duplicates) for PFAS analysis will be collected and analysed at a minimum frequency of 1 in 10 primary samples.

4.12.2 Rinsate Samples

Rinsate samples are to be collected at a rate of one sample per fieldwork day by pouring laboratory supplied deionised water over the decontaminated sampling equipment.

4.12.3 Trip Blank Samples

Trip blank samples, for water, will be supplied by the laboratory and placed in the eskies used to transport the samples at a rate of one per batch of samples delivered to the laboratory. The trip blank samples will be analysed for PFAS to assess if any contaminants have entered the sample containers in transit to the laboratory or within the container itself.

4.13 Fieldwork Documentation

4.13.1 Field Notes

Field notes will be collected electronically and maintained to record all field sampling events and include observations made at each sample location. Field notes will include information specific to the sample media as follows:

- Groundwater gauging and sampling- date and time of gauging, HydraSleeve™ installation and sampling will be recorded at each sampling location.
- Groundwater and surface water samples – comments on the observed characteristics of the sample (e.g. colour, turbidity, odour, sheen) and reported field water quality parameters (pH, EC, DO, ORP, temperature) will be recorded; and
- Sediment and surface water samples - comments on the morphology of the sample location, the depth, flow direction and strength of water flow (if water is present), the water and sediment/soil colour and odour, and the presence of flora and fauna. The soil/sediment types observed at each sample location will be described using the Unified Soil Classification System (USCS).

The coordinates for each sample location will be noted. The location of quality control (e.g. duplicate and inter-laboratory duplicate) sample collection points will also be noted.

AECOM's tablet-based data capture ('EDCA') system will be utilised by field staff to minimise potential data recording errors and allow on-the-spot identification of potentially erroneous data in comparison to historical data.

4.13.2 Sample Labels

AECOM will utilise the tablet-based ALS 'Compass' sample management application to streamline sample labelling and chain of custody (CoC) creation to ensure compliant sample IDs are used in the field.

Sample containers will also be labelled with the sample ID as a failsafe method.

A ball point pen will be used for labelling, to ensure PFAS is not introduced to the samples from permanent markers.

4.13.3 Chain of Custody Forms

A CoC form will be completed, documenting the sample identification number and analytes. The CoC documents the chain of events from sample collection to delivery at the laboratory and provides a traceable account of sample handling. The CoC form will be signed by both the sample collector and the receiving laboratory. The CoC will be generated electronically using the ALS Compass application to reduce potential transcription errors.

The CoC form will include the following information:

- Job number (Note: the name of the Base is not identified for confidentiality purposes);
- Defence ESdat database reference (i.e. QLD_0229_PFASOMP_20);
- Date and time of sample collection;
- Sample ID;
- Type of containers;
- Name of sampler;
- Laboratory to be used;
- Analyses required;
- Any comments; and
- Signatures of the sampler and laboratory receiver.

In the event that additional samples are collected during the field investigations due to observations made by the Field Team, (i.e. samples not proposed in this SAQP), Defence will be provided the rationale for collection of those samples and proposed laboratory analyses. Defence approval will be sought to include these samples on the CoC and to dispatch these samples to the laboratory.

Upon receipt of the original documents accompanying the samples at the laboratory, the laboratory will provide a sample receipt document (noting the temperature of samples upon receipt, analyses required and any non-conformances) and return the signed CoC form to confirm analyses to be performed and the due date for the analytical results.

4.13.4 Sampling Documentation

Field sampling sheets will be completed for each location, and will include the following information (as appropriate for the media being sampled):

- Name of sampler;
- Sample location;
- Date /time of monitoring/ sampling;
- Sampling method;
- Observations of the sampled media; and
- Calibration records.

Records of all equipment calibration will be included in the Sampling Event Factual Reports. Photographs of surface water sampling locations will be taken where permitted.

4.14 Reporting

4.14.1 Sampling Event Factual Report

No later than four weeks following receipt of the laboratory reports, AECOM will prepare and submit a Sampling Event Factual Report to Defence. Each Sampling Event Factual Report will include:

- Details of the scope of monitoring completed;
- A description of the sampling methodologies used;
- A summary of observations made while sampling (e.g. recent weather conditions, any visual or olfactory observations that may indicate impacts to surface water or groundwater, or any estate management works or training activities that may have the potential to impact sampling or data);
- A summary of any changes to the monitoring network condition that may affect data integrity, or require rectification works, and recommendations for repair, replacement or decommissioning of a location;
- A presentation of the analysis results in a table that includes comparisons with PFAS guidelines, highlighting any significant statistical deviations from historical monitoring and investigation data, and identifying any locations with first-time detections of PFOS + PFHxS or PFOA or new exceedances of guideline values;
- A presentation of the relative groundwater levels for the event on a figure with inferred contours and inferred groundwater flow direction;
- Discussion of the analytical data quality, including review of the quality control sampling results and laboratory quality control data; and
- Inclusion of the following information as attachments:
 - Figures;
 - Tables;
 - Sampling logs and forms including field water quality parameter measurements;

- Chain of custody forms;
- Laboratory analytical certificates and QA/QC reports; and
- Equipment calibration certificates.

4.14.2 Annual Interpretive Report

At the end of each 12-month monitoring period, AECOM will prepare and submit an Annual Interpretive Report to Defence. Each Interpretive Report will include:

- Evidence of compliance with the requirements of the SAQP and meeting stated objectives of the OMP (Department of Defence, 2020);
- Relevant figures depicting sampling locations and site-specific hydrogeological features;
- Laboratory results and analysis including comparison with relevant screening criteria as identified in the OMP (Department of Defence, 2020);
- Assessment and commentary on appropriate QA/QC procedures;
- A review of the CSM and provision of a revised CSM if required;
- Data interpretation, including trends in groundwater concentration, gradient and flow directions;
- Assessment of statistically based trends that may inform decision making when it comes to the revision of the OMP (Department of Defence, 2020); and
- A statement as to whether the risk profile has changed overall, or for any specific location on the Base or within the Management Area, and a recommendation as to whether this should trigger an OMP and/or PMAP review, or other action.

4.15 Deviation from OMP

While the scope of works and methodology described in this SAQP are generally consistent with that presented in the OMP (Defence, 2020), deviations as a result of subsequent sampling events may occur as a result of review of recommendations made in the Sampling Event Reports (AECOM, 2021a) (AECOM, 2021b), (AECOM, 2021c) and (AECOM, 2022).

During the October 2020 Dry Season Sampling Event surface water sample location SW150 described in the OMP as being from a tap, could not be located and an appropriate location for sampling was unable to be identified. This location has not been sampled to date and has been removed from the SAQP.

During the April 2022 Sampling Event monitoring well sample locations MW117D and MW117S were damaged by construction works and therefore have been removed from the SAQP.

5.0 References

- AECOM. (2021a). *Sampling Event Factual Report, October 2020, PFAS Ongoing Monitoring Program - Lavarack Barracks, Townsville QLD.*
- AECOM. (2021b). *Sampling Event Factual Report March/April 2021, PFAS Ongoing Monitoring Program - Lavarack Barracks, Townsville QLD.*
- AECOM. (2021c). *Sampling Event Factual Report, August 2021 - PFAS Ongoing Monitoring Program- Lavarack Barracks.*
- AECOM. (2022). *Sampling Event Factual Report, March/April 2022 - PFAS Ongoing Monitoring Program- Lavarack Barracks.*
- Australian and New Zealand Governments and Australian state and territory governments [ANZG]. (2018). *Australian and New Zealand Guidelines for Fresh and Marine Water Quality.*
- Department of Defence. (2018). *Routine Environment Water Quality Monitoring Manual.*
- Department of Defence. (2018, amended June 2021). *Defence Contamination Management Manual.*
- Department of Defence. (2020). *PFAS Management Area Plan - Lavarack Barracks.*
- Department of Health (DoH). (2019). *Health Based Guidance Values for PFAS for use in site investigations in Australia.*
- Heads of Environmental Protection Agencies (HEPA). (2020). *PFAS National Environmental Management Plan (NEMP).*
- National Environment Protection Council [NEPC]. (1999, as amended May 2013). *National Environment Protection (Assessment of Site Contamination) Measure (NEPM), Schedule B2: Guideline on Site Characterisation.*
- National Health and Medical Research Council (NHMRC). (2019). *Guidance on PFAS in Recreational Water.*
- RPS/Wood. (2019). *Detailed Site Investigation Lavarack Barracks PFAS Investigation.* West Perth WA.
- RPS/Wood. (2019a). *Seasonal Monitoring Report Lavarack Barracks PFAS Investigation.*
- RPS/Wood. (2020b). *Seasonal Monitoring Report 2 Lavarack Barracks PFAS Investigation.*
- Standards Australia. (1998). *AS/NZS 5667.11-1998: Water Quality - Sampling - Guidance on Sampling of Groundwaters.*
- Standards Australia. (1999). *AS 4482.2-1999: Guide to the sampling and investigation of potentially contaminated soil, Part 2: Volatile Substances.*
- Standards Australia. (2005). *AS 4482.1-2005: Guide to the sampling and investigation of potentially contaminated soil. Part 1: Non-volatile and semi-volatile compounds.*
- State of Queensland. (2019). *Environmental Protection (Water and Wetland Biodiversity) Policy.*
- United States Environmental Protection Agency (US EPA). (2006). *Guidance on Systematic Planning Using the Data Quality Objectives Process (EPA QA/G-4: EPA/240/B-06/001).*

Appendix A

Figures

Legend

- Management Area
- Sub-Management Area Boundary
- Aplin's Weir
- Source Areas
- Major Watercourse
- Minor Watercourse
- Major Culvert
- Minor Culvert

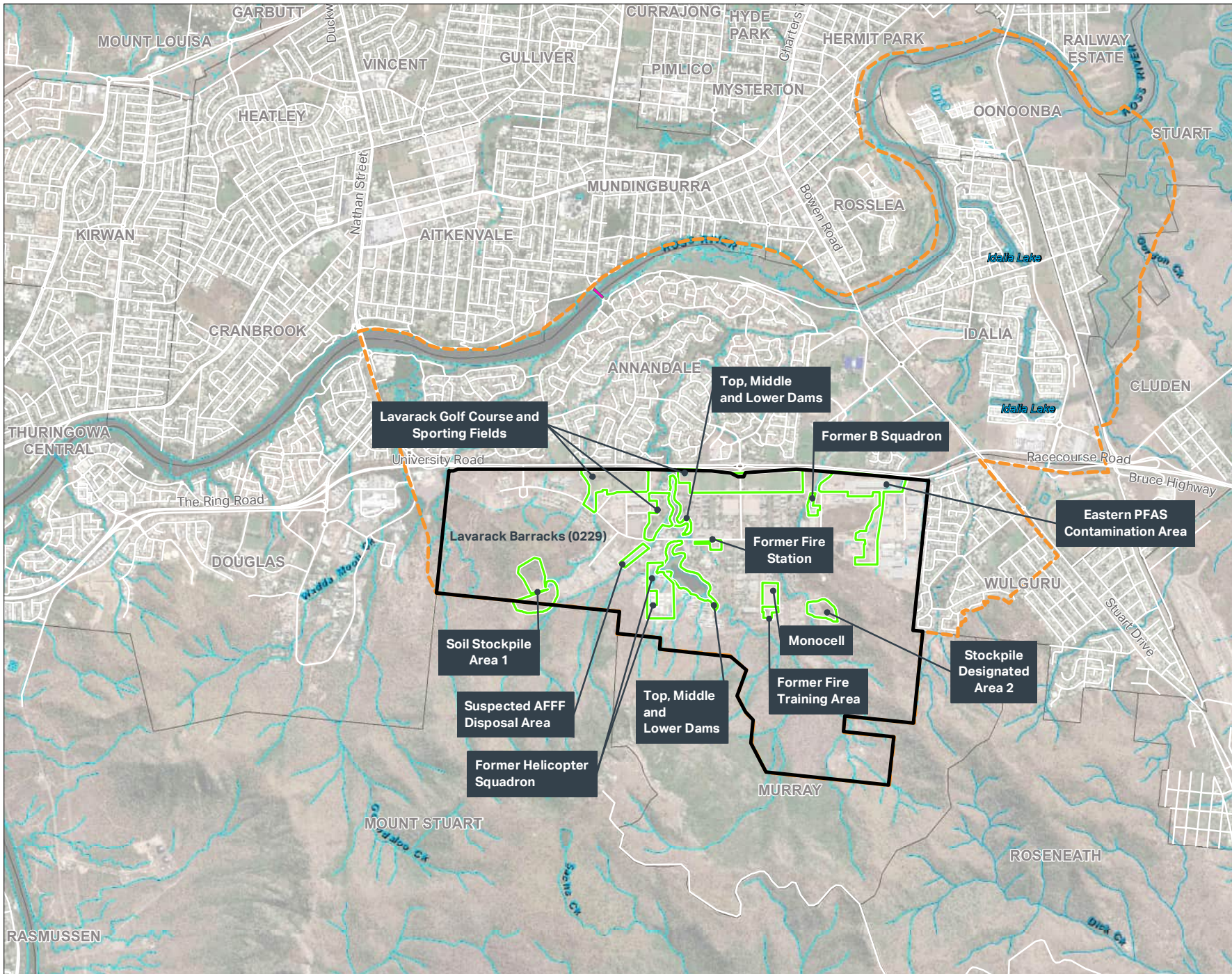


FIGURE 1:
LAVARACK BARRACKS
LOCATION AND
SOURCE AREAS

PROJECT NAME:
PFAS OMP
REPORT NAME:
PFAS OMP – Lavarack Barracks
(0229) Townsville,
Sampling and Analysis Quality Plan
CLIENT NAME:
Department of Defence
PROJECT NUMBER:
60612487

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Sources:
Base Data: (c) 2020 (ESRI, Digital Globe, GeoEye, Earthstar Geographics, CNES/Airbus DS,
USDA, USGS, AeroGRID, IGN and the GIS User



Legend

- Management Area
- Sub-Management Area Boundary
- Aplin's Weir
- Source Areas
- On-base Monitoring Well
- Off-base Monitoring Well
- Major - perennial
- Major - non perennial
- Minor - perennial
- Minor - non perennial

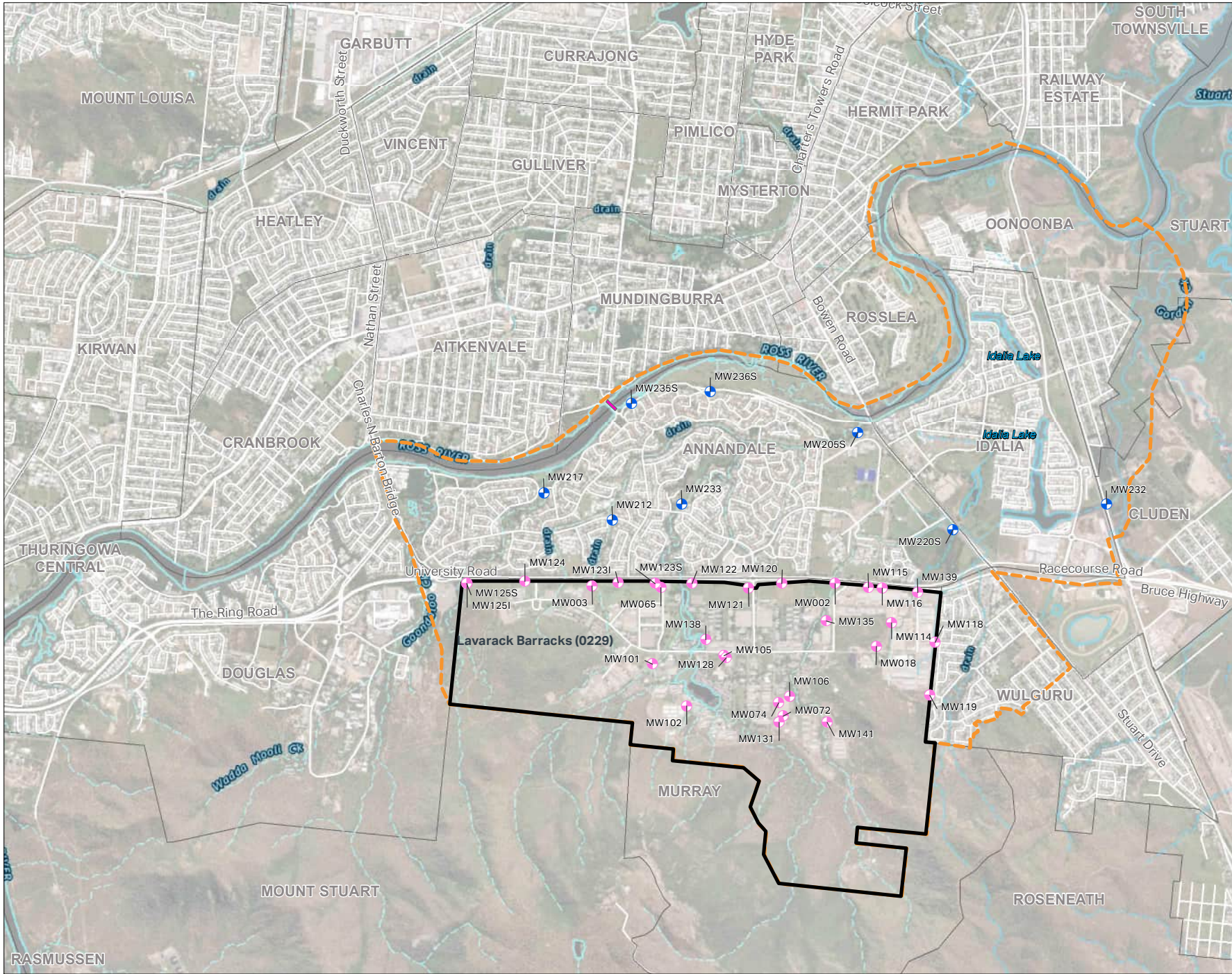
**FIGURE 2:
GROUNDWATER
SAMPLING LOCATIONS**

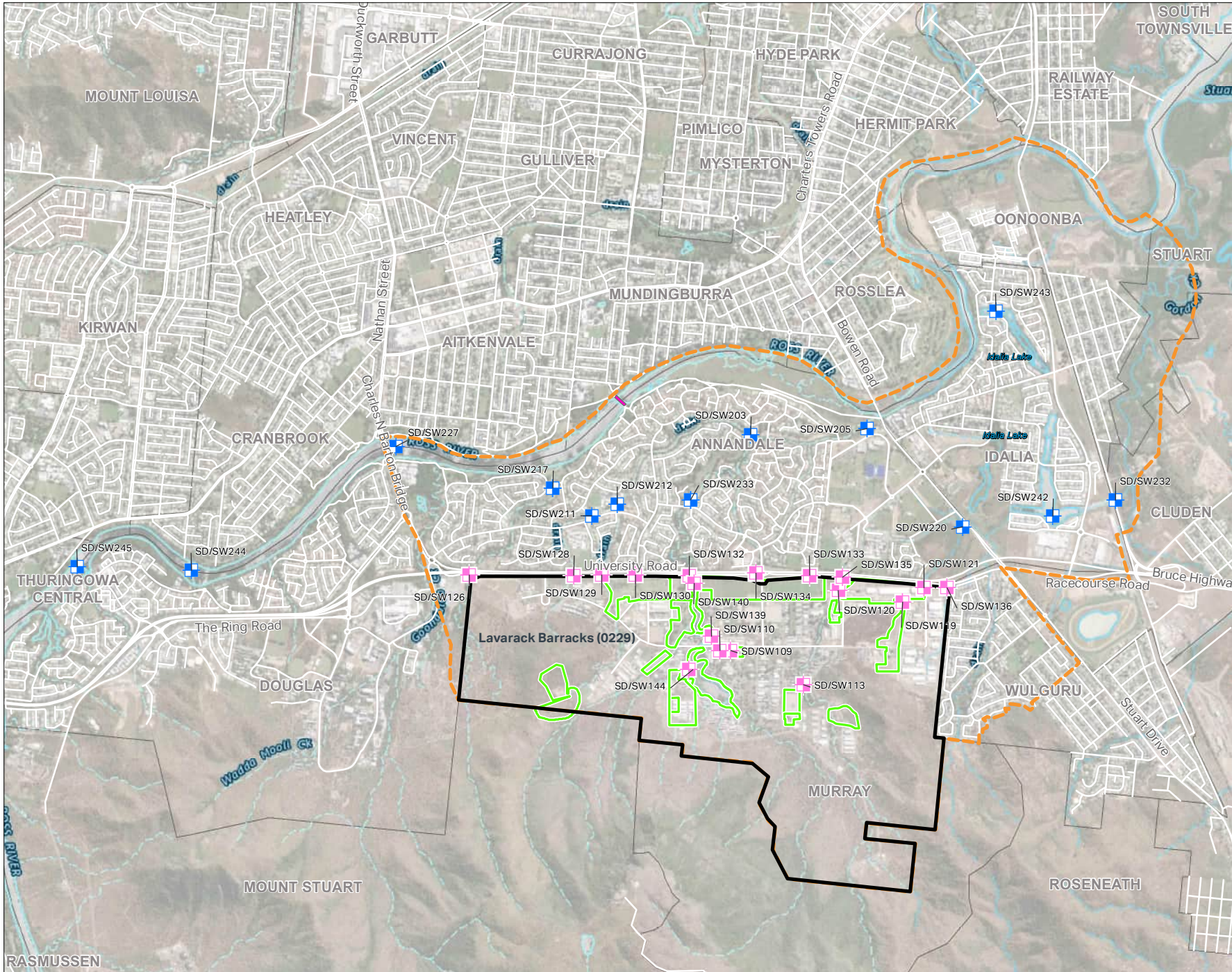
PROJECT NAME:
PFAS OMP
REPORT NAME:
PFAS OMP – Lavarack Barracks
(0229) Townsville,
Sampling and Analysis Quality Plan
CLIENT NAME:
Department of Defence
PROJECT NUMBER:
60612487

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USDA, USGS, AeroGRID, IGN and the GIS User





- Legend**
- Management Area
 - Sub-Management Area Boundary
 - Aplin's Weir
 - Source Areas
 - On-base Surface Water/Sediment Sample
 - Off-base Surface Water/Sediment Sample
 - Major - perennial
 - Major - non perennial
 - Minor - perennial
 - Minor - non perennial

**FIGURE 3:
CO-LOCATED SURFACE
WATER AND SEDIMENT
SAMPLING LOCATIONS**

PROJECT NAME:
PFAS OMP
REPORT NAME:
PFAS OMP – Lavarack Barracks
(0229) Townsville,
Sampling and Analysis Quality Plan
CLIENT NAME:
Department of Defence
PROJECT NUMBER:
60612487

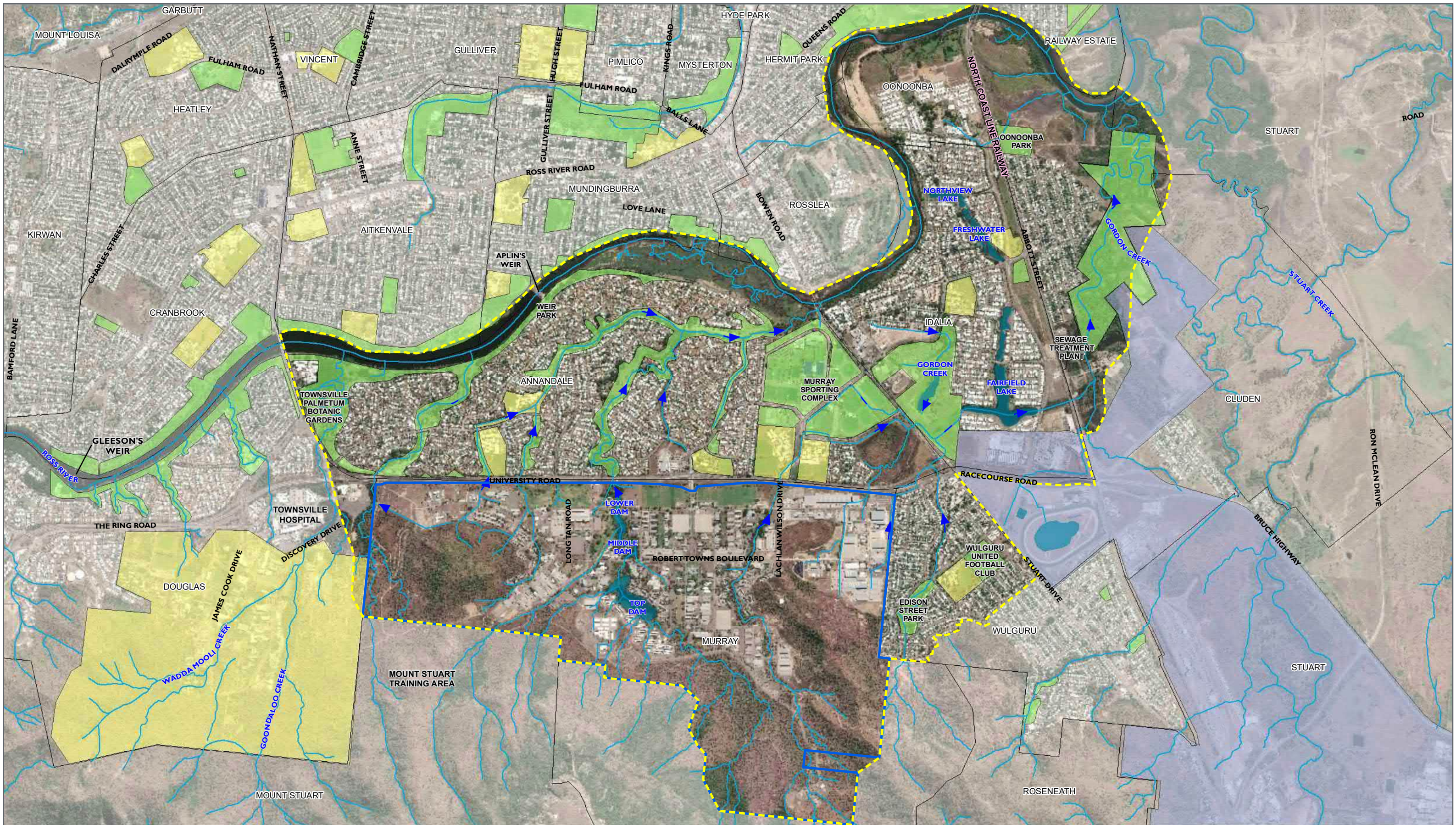
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USDA, USGS, AeroGRID, IGN and the GIS User

Appendix B

Lavarack Barracks Management Area



C16094-035 OMP LEGEND LOCATION DIAGRAM

Figure 1
Key Features in the
Management Area

C16094_035_OMP_001

DATA SOURCES:
 Sample locations - RPS/Wood, 2019
 Roads, waterways - Queensland Government, 2019
 Basemaps World Topographic and Imagery - Esri Online

ISSUE DATE	AUTHOR	QA CHECK	APPROVED	REVISION	NOTE
07/02/2020	RL	CC	CC		

0 250 500 1,000
Metres

1:28,000 (A3) GDA 1994 MGA Zone 55

- Management Area
- Lavarack Barracks Boundary
- Waterway Flow Direction
- Waterway
- Waterbodies
- Locality Boundaries
- Educational Institution
- Commercial and Industrial Areas
- Land for Public Recreation



Appendix C

Well Construction Details

Location Code	Well Screen Depths (mbtoc)	Well Depth (mbtoc)
Eastern PFAS Contamination Area		
MW018	Not available in ESdat	9.05
MW114	Not available in ESdat	6.68
MW115	12.7 - 15.7	15.62
MW116	5 - 8	7.88
MW139	2.8 - 5.8	5.76
Former B Squadron		
MW135	3 - 6	6.365
Former Fire Station		
MW105	3 - 6	6.29
MW128	2.6 - 5.6	5.47
Former Fire Training Area		
MW131	5.4 - 8.4	8.7
Former Helicopter Squadron		
MW102	8.5 - 14.5	9.81
Lavarack Golf Course & Sporting Field		
MW065	1.5 - 6	6.5
MW120	4 - 7	7.58
MW121	2.5 - 5.8	6.39
MW122	9.3 - 16.3	16.9
MW123I	5.8 - 8.8	10.11
MW123S	1 - 5	5.6
Monocell		
MW072	Not available in ESdat	7.928
MW074	Not available in ESdat	7.13
MW106	2.5 - 8.5	10.14
Stockpile Designated Area 2		
MW141	Not available in ESdat	8.815
Suspected AFFF Disposal Area		
MW101	5 - 9	6.87
Top, Middle and Lower Dams		
MW138	6 - 9	9.07
Base Boundary		
MW002	Not available in ESdat	5.21
MW003	Not available in ESdat	30.83
MW118	3 - 6	6.02
MW119	5.4 - 10.4	10.41
MW124	3 - 6	7.89
MW125I	5.8 - 8.8	21.92
MW125S	1 - 5	7.71
Off-Base		
MW205S	8 - 11	8.8
MW212	6 - 9	8.86
MW217	3 - 6	5.45
MW220S	2 - 5	6.02
MW226	Not available in ESdat	5.85
MW232	1 - 4	3.03
MW233	4.2 - 7.2	7.56
MW235S	4.1 - 8.1	7.94
MW236S	4 - 7	6.92

Appendix E

Factual Reports

Sampling Event Factual Report, October 2020

PFAS Ongoing Monitoring Program - Lavarack Barracks,
Townsville, QLD

AECOM

North Queensland PFAS Ongoing Monitoring Program
Sampling Event Factual Report, October 2020 – PFAS Ongoing Monitoring Program
- Lavarack Barracks, Townsville, QLD

Sampling Event Factual Report, October 2020

PFAS Ongoing Monitoring Program - Lavarack Barracks, Townsville, QLD

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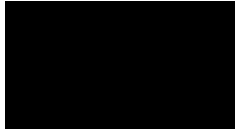
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Abbreviations

Abbreviation	Term
AECOM	AECOM Australia Pty Ltd
AFFF	Aqueous Film Forming Foam
AHD	Australian Height Datum
ALS	ALS Environmental Pty Ltd
Defence	Department of Defence
DO	Dissolved Oxygen
DoH	Department of Health
EC	Electrical Conductivity
FSANZ	Food Standards Australia New Zealand
HEPA	Heads of Environment Protection Authority
LOR	Limit of Reporting
NATA	National Association of Testing Authorities
NEPM	National Environment Protection Measure
NHMRC	National Health and Medical Research Council
NMI	National Measurement Institute
OMP	Ongoing Monitoring Program
ORP	Oxidation Reduction Potential
PFAS	Per- and poly-fluoroalkyl substances
PFHxS	Perfluorohexanesulfonic acid
PFOA	Perfluorooctanoic acid
PFOS	Perfluorooctanesulfonic acid
PMAP	PFAS Management Area Plan
QA/QC	Quality Assurance and Quality Control
SAQP	Sampling and Analysis Quality Plan
TASMIS	Training Area Safety and Management Information System

Units

Abbreviation	Term	Abbreviation	Term
km	Kilometre	mAHD	Metres Australian Height Datum
L	Litres	mBTOC	Metres below top of casing
M	Metre		

1.0 Introduction

1.1 General

AECOM Australia Pty Ltd (AECOM) was engaged by the Department of Defence (Defence) to implement the per- and poly-fluoroalkyl substances (PFAS) Ongoing Monitoring Program (OMP) outlined in the PFAS Management Area Plan (PMAP) (Department of Defence, 2020a) at Lavarack Barracks, Townsville (the 'Base') located in the North Queensland Region. The location of the Base and the PFAS Source Areas are shown in **Figure 1** in **Appendix A**. The OMP (Department of Defence, 2020a) for Lavarack Barracks includes biannual groundwater, surface water, and sediment sampling events in October 2020, April and October in 2021 and April 2022.

Following each sampling event, a factual report will be prepared. Annual interpretative reports will be prepared following the completion of each 12-month sampling period. This sampling event factual report has been prepared to report the results of the post dry-season sampling event completed in October and November 2020, specifically highlighting first-time detections and/or first-time exceedances of human health screening criteria for perfluorohexane sulfonic acid (PFHxS)+ perfluorooctane sulfonate (PFOS) and perfluorooctanoic acid (PFOA), where relevant.

This report has been prepared in accordance with the Defence (2020) PFAS OMP factual reports – interim guidance for preparation, v2.0, March 2020 (Department of Defence, 2020b).

1.2 Objectives

The objectives of the OMP are to:

- Implement the OMP prepared as part of the PMAP; and
- Collect data that will enable Defence to maintain an up to date understanding of the distribution, concentration and transport of PFAS at the Base.

The data will assist in the timely identification of risks and inform Defence's approach to the management of PFAS, including updates and revisions to the PMAP.

The objective of this phase of works is to implement the scope of works for the October and November 2020 sampling event in accordance with the sampling and analysis quality plan (SAQP) (AECOM, 2020).

2.0 Scope of Work

The sampling event at Lavarack Barracks was completed in general accordance with the SAQP (AECOM, 2020). In summary, the scope of works for this sampling event included:

- Obtaining permission to work in public spaces where some sampling locations are situated.
- Review of the SAQP prior to monitoring event to ensure compliance with the following:
 - PFAS National Environmental Management Plan (NEMP) (2020);
 - National Environment Protection (Assessment of Site Contamination) Measure 1999, Schedule B1, as amended in 2013 (ASC NEPM, 2013);
 - Defence Routine Environment Water Quality Monitoring Manual;
 - AS/NZ 5667:1998 Water quality – Sampling;
 - Australian and New Zealand Guidelines for Fresh and Marine Water Quality; and
 - Relevant State regulatory guidelines.
- Gauging of groundwater level in monitoring wells prior to collection of samples (refer to **Table 1** below, and **Figure 2** in **Appendix A** for specific locations).
- Collection of groundwater samples at 40 locations including 31 on-Base locations, and nine off-Base locations (refer to **Table 1** below, and **Figure 2** in **Appendix A**).
- Collection of co-located surface water and sediment samples at 31 locations including 17 on-Base and 13 off-Base locations (refer to **Table 2** and **Table 3** below, and **Figure 3** in **Appendix A**).
- Collection of a standalone surface water sample (no sediment) from one on-Base location (**Table 2** below and **Figure 3** in **Appendix A**). It is noted that a total of 13 surface water samples and two sediment samples could not be collected during this sampling event (refer to **Table 18** for details).
- Collection of field duplicate samples at a rate of one in 10 primary samples, one rinsate sample per fieldwork day.
- Analysis of all samples for the PFAS suite at the standard limit of reporting (LOR).
- Preparation of this Sampling Event Factual Report.

Table 1 Groundwater Sampling Locations

Source Area	Monitoring Well ID
Eastern PFAS Contamination Area	MW018, MW114, MW115, MW116, MW139
Former B Squadron	MW135
Former Fire Station	MW105, MW128
Former Fire Training Area	MW131
Former Helicopter Squadron	MW102
Lavarack Golf Course and Sporting Fields	MW065, MW120, MW121, MW122, MW123_I, MW123_S
Monocell	MW072, MW074, MW106
Stockpile Designated Area 2	MW141
Suspected Aqueous Film Forming Foam (AFFF) Disposal Area	MW101
Top, Middle and Lower Dams	MW138
Base Boundary – On-Base	MW002, MW003, MW117_D, MW117_S, MW118, MW119, MW124, MW125_I, MW125_S
Off-Base	MW205_S, MW212, MW217, MW220_S, MW226, MW232, MW233, MW235_S, MW236_S

Table 2 Surface Water Sampling Locations

Source Area	Surface Water Location ID
Eastern PFAS Contamination Area	SW119, SW121
Former Fire Station	SW109, SW110
Lavarack Golf Course and Sporting Fields	SW129, SW130, SW150
Top Middle and Lower Dams	SW137, SW139, SW140
Remaining on-Base	SW113, SW120
Base Boundary	SW126, SW128, SW132, SW133, SW134, SW135, SW136
Off-Base	SW203, SW205, SW211, SW212, SW217, SW220, SW227, SW232, SW233, SW242, SW243, SW244, SW245

Table 3 Sediment Sampling Locations

Source Area	Sediment Location ID
Eastern PFAS Contamination Area	SD119, SD121
Former Fire Station	SD109, SD110
Lavarack Golf Course and Sporting Fields	SD129, SD130,
Top Middle and Lower Dams	SD137, SD139, SD140
Remaining on-Base	SD113, SD120
Base Boundary	SD126, SD128, SD132, SD133, SD134, SD135, SD136
Off-Base	SD203, SD205, SD211, SD212, SD217, SD220, SD227, SD232, SD233, SD242, SD243, SD244, SD245

2.1 Deviations from the SAQP

Table 4 lists the deviations from the SAQP (AECOM, 2020) during this sampling round.

Table 4 Deviation from the SAQP during Dry Season 2020 Sampling Event

SAQP	Dry Season Sampling 2020
The water quality meter will be calibrated each day prior to the commencement of field activities.	The water quality meter was calibrated at the end of each day of sampling in preparation for the following day.
Co-located surface water and sediment samples were scheduled to be collected from SD/SW211 and SD/SW212.	During the sampling event it was identified that SD/SW211 and SD/SW212 are located on private property. These locations have not been included in this factual report.
Surface water sample was to be collected from SW150.	SW150 was not located during the sampling event and was therefore not sampled. This tap sampling location has not been sampled before and was unable to be found.
Collection of surface water at 10 co-located surface water and sediment locations	These locations were dry during the sampling event and samples of surface water were unable to be collected.

Table 5 summarises the changes to location identification names as suggested in the SAQP (AECOM, 2020) based on compliance with Defence Contamination Management Manual (DCMM) Annex L requirements (Defence, 2018 as amended 2019).

Table 5 Summary of Location ID Changes

Previous Location ID	Updated Location ID
MW002A	MW002
MW117B	MW117_S
MW123A	MW123_S
MW123B	MW123_I
MW125A	MW125_I
MW125B	MW125_S
MW205B	MW205_S
MW220	MW220_S (listed as MW220 in SAQP)
MW235B	MW235_S
MW236B	MW236_S
SD137A	SD137
SW137A	SW137

3.0 Methodology

The methodology used for the October and November 2020 sampling event was in general accordance with the SAQP (AECOM, 2020) and is summarised below in **Table 6**. Deviations from the SAQP are discussed in **Section 0**.

Table 6 Overall Methodology

Item	Details
Quality Assurance/Quality Control (QA/QC) Samples	Field QA/QC samples collected included intra-laboratory duplicate and inter-laboratory duplicate samples (i.e. splits), and rinsate samples. Refer to Appendix C for assessment of QA/QC sample data.
Sample Analysis	All primary samples were submitted for PFAS suite analysis using the standard levels of detection. ALS Environmental Pty Ltd (ALS) Brisbane, Queensland was used as the primary laboratory. The National Measurement Institute (NMI) of Sydney, NSW was used as the secondary laboratory. ALS and NMI methods for analyses of PFAS in are certified by the National Association of Testing Authorities (NATA). Chain of Custody Forms are presented in Appendix D . Laboratory certificates are presented in Appendix E .
Field Parameters	Temperature, electrical conductivity (EC), dissolved oxygen (DO), oxidation reduction potential (ORP), pH and observations of water quality were recorded for all groundwater and surface water samples using a calibrated water quality meter. Equipment calibration certificates for the water quality meter are provided in Appendix F .

3.1 Groundwater Sampling Methodology

The groundwater sampling methodology is outlined in Table 5 below.

Table 7 Groundwater Sampling Methodology

Item	Details
Groundwater gauging	The depth to groundwater was measured in each monitoring well immediately prior to the collection of groundwater samples.
Sample Collection Methodology	Groundwater samples were collected from all monitoring wells using no-purge methodology HydraSleeves™, which were installed within the screened interval of each well (based on a review of the well construction log) for a minimum of 24 hours prior to the sampling round (as detailed in Table T1 , Appendix B). Once sampling was completed, new HydraSleeves™ were deployed at the screened interval depth in preparation for the next sampling round, with the exception of wells where tree roots could prohibit the retrieval of the HydraSleeves™ in future rounds, as detailed in Table 18 . HydraSleeves™ were not installed in monitoring wells which are also sampled as part of the routine Water Quality Monitoring Program.

3.2 Surface Water Sampling Methodology

The surface water sampling methodology is outlined in **Table 8** below.

Table 8 Surface Water Sampling Methodology

Item	Details
Sampling methodology	Samples were collected from immediately below the water surface, with either a sampling pole or directly into laboratory supplied sample containers, to minimise collection of sediment or floating materials in the samples. At each location, a new, laboratory-supplied container was lowered into the water with the cap immediately applied once the container was full.

3.3 Sediment Sampling Methodology

The sediment sampling methodology is outlined in **Table 9** below.

Table 9 Sediment Sampling Methodology

Item	Details
Sampling Collection Methodology	Samples representative of potentially deposited sediments were collected from within the water body (if possible) using a piston sediment sampler or with a trowel from the base of drains (where possible). Samples were collected from the surface of the sediment up to a depth of 0.1 m, where this depth was achievable. At each location, a new laboratory supplied container was used for each sample.
Logging	Sediment characteristics were recorded for each sample and are summarised in Table T5, Appendix B .

3.4 Adopted Screening Criteria

Adopted screening criteria references national guidance in the form of the PFAS National Environmental Management Plan (NEMP), Defence estate and environmental strategies, and Defence PFAS-specific strategies and guidance. Guidance documents used to assess the dataset include the following:

- PFAS NEMP, (HEPA 2020).
- Department of Health (DoH), 2019. *Health Based Guidance Values for PFAS for use in site investigations in Australia*. April 2017 [updated September 2019].
- National Health and Medical Research Council (NHMRC), 2019. *Guidance on PFAS in Recreational Water*. August 2019 (NHMRC 2019).
- *National Environment Protection (Assessment of Site Contamination) Measure 1999, Schedule B1, as amended in 2013* (ASC NEPM).

In accordance with the OMP (Department of Defence, 2020a) and SAQP (AECOM, 2020), the adopted PFAS screening criteria to assess the data generated as part of the OMP are presented in **Table 10** below.

Table 10 Summary of Adopted Screening Criteria

Pathway	Compound	Criteria	Comment / Reference
Human Health Receptors			
Off-Base - Drinking Water	PFOS + PFHxS	0.07 µg/L	The values are from the PFAS NEMP (HEPA, 2020). Where the guideline value refers to the sum of PFOS + PFHxS, this includes PFOS only, PFHxS only and the sum of the two (HEPA, 2020). <i>All off base groundwater results will be compared to these criteria as well as one surface water location which is within Townsville's emergency drinking water supply.</i>
	PFOA	0.56 µg/L	
Recreational use – surface water	PFOS + PFHxS	2 µg/L	The values are from the PFAS NEMP (HEPA, 2020). <i>All surface water results will be compared to these criteria.</i>
	PFOA	10 µg/L	
Ecological Receptors			
Freshwater and marine water (95% species protection values)	PFOS	0.13 µg/L	The values are from the PFAS NEMP (HEPA, 2020). <i>All surface water and groundwater results will be compared to these criteria.</i>
	PFOA	220 µg/L	

There are no human health or ecological guideline values available for sediment.

3.5 Data Quality Objectives and Data Validation

The data quality objectives and data quality indicators adopted for these works are presented in the SAQP (AECOM, 2020).

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

The data validation procedure employed in the assessment of the field and laboratory QA/QC data indicated that the reported analytical results are representative of the sample locations and that the overall quality of the analytical data produced is acceptably reliable for the purpose of this report.

All data collected during this event has been reviewed and uploaded to the Defence ESdat database in accordance with DCMM (Defence, 2018 as amended 2019) Annex L requirements.

4.0 Field Observations and Results

The 2020 dry season sampling event was completed between 26 October and 3 November 2020, commencing with groundwater gauging and deployment of HydraSleeves™. The results are summarised in the following sections.

Details on weather conditions and estate management works or training activities during the sampling event are recorded in **Table 11**.

Table 11 Weather Conditions and Estate Activities at Time of Sampling

Item	Observations
Weather Conditions	Weather was clear, hot and humid during the sampling event.
Estate Management Works or Training Activities	MW124, MW125_S and MW125_I are located within the Lavarack Barracks Close Training Area, controlled by Mount Stuart Training Area Range Control. A Training Area Safety and Management Information System (TASMIS) booking is required to access these areas. During the sampling event a TASMIS booking was made to access the area, however a training exercise was being conducted in the area concurrently. Sampling was conducted at the conclusion of the training exercise. The training exercises being conducted were not considered to impact the quality of the samples collected. No estate management works or training exercised impacted the sampling of surface water and sediment locations.

4.1 Groundwater Observations and Field Measurements

Table 12 Groundwater Observations and Field Measurements

Item	Observations
Access	All monitoring wells were accessible.
Monitoring Well Network	The headworks at the following monitoring wells were noted to be damaged during the 2020 dry season sampling event: <ul style="list-style-type: none"> MW115 was bent at approximately 0.75 metres below top of casing (mBTOC). Well was able to be sampled in this sampling event using a HydraSleeve™ without a collar. MW003 was bent at ground level. Well was able to be sampled in this sampling event using a HydraSleeve™ without a collar. Concrete around the monument of MW125_S was cracked. Well casing was unaffected and well was able to be sampled in this sampling event. The ground had washed away at MW121 and the monument wobbled. Well casing was unaffected and well was able to be sampled in this sampling event.
Field Observations	Groundwater from five monitoring well locations (MW115, MW123_I, MW205_S, MW233 and MW235_S) had a sulphurous odour. Groundwater from three monitoring well locations (MW101, MW116 and MW131) had an organic (earthy) odour. Groundwater colour ranged from clear to brown. No other visible or olfactory indications of contamination were observed during the sampling of the monitoring wells. MW131, MW101 and MW235_S were blocked with tree roots. The blockages were removed with a decontaminated steel bailer and the HydraSleeve™ was subsequently deployed. Field observations are presented Table T1 in Appendix B .
Depth to Groundwater	Depth to groundwater was between 0.565 and 5.964 metres below top of casing (mBTOC). Groundwater elevations were between 0.603 and 23.306 metres Australian Height Datum (mAHD). Groundwater gauging data are presented in Table T1 in Appendix A .

Item	Observations
Groundwater Flow Direction	Groundwater contours and inferred groundwater flow directions in late October and early November 2020 are shown on Figure 4 in Appendix A . The inferred local groundwater flow direction is to the east-north-east, towards Cleveland Bay.
Geophysical Parameters	Groundwater geophysical parameters were measured at the time of sampling. The readings are presented in Table T1 in Appendix B and are summarised below: <ul style="list-style-type: none"> DO results ranged between 1.44 mg/L (MW220_S) and 7.93 mg/L (MW236_S) indicating mildly to well oxygenated conditions. EC ranged from 7.4 µS/cm (MW236_S) to 51,290 µS/cm (MW232) fresh to saline conditions. pH ranged from 5.5 (MW232) to 7.61 (MW117_S). pH results generally indicated slightly acidic to neutral conditions. ORP ranged from -67.3 mV (MW205_S) to 112.5 mV (MW125_S) indicating mildly to strongly reducing conditions. Temperature ranged from 26.2°C (MW226) to 31°C (MW072 and MW074).

4.1.1 PFAS Groundwater Analytical Results

Of the 40 groundwater wells sampled during this event, 39 samples reported concentrations of PFAS compounds above the laboratory LOR. The PFAS groundwater analytical results from this sampling event are presented in **Table T2** in **Appendix B**. Four off-Base samples exceeded the adopted drinking water guideline for sum of PFHxS and PFOS and 23 samples, both on and off-Base, exceeded the adopted ecological guidelines for PFOS (**Table T2, Appendix B**).

First-time detections and first-time exceedances of guideline values are presented in **Table 13** below.

Table 13 First-time Detections of PFAS or New Exceedances of Guidelines in Groundwater

Type	Monitoring wells / bores	PFOS concentration (µg/L)		PFOA concentration (µg/L)		PFHxS + PFOS concentration (µg/L)	
		Oct/Nov 2020	Historical maximum	Oct/Nov 2020	Historical maximum	Oct/Nov 2020	Historical maximum
First-time detections of PFOS, PFOA or PFHxS+PFOS	MW116	0.01**	ND*	<0.01	ND	0.08	0.03
	MW117_D	0.02	ND	<0.01	ND	0.04	0.04
	MW118	0.01	ND	<0.01	ND	0.05	0.05
	MW124	0.01	ND	<0.01	ND	0.01	ND
	MW125_S	0.02	ND	<0.01	ND	0.26	0.3
	MW205_S	0.02	ND	<0.01	ND	0.04	0.02
	MW220_S	0.04	ND	<0.01	ND	0.68	0.38
	MW235_S	0.02	ND	<0.01	ND	0.02	0.02
First-time exceedance of the NEMP (HEPA, 2020) 95% species protection ecological screening criteria in on-Base groundwater.	MW120	0.14^	0.03	<0.01	ND	0.27	0.17
	MW232	0.17	0.1	<0.01	ND	0.27	0.21

Concentrations have been rounded to two decimal places.

* ND = not detected

**Blue cells denote first time detection above LOR.

^Yellow cells denote new exceedance of guideline values.

4.2 Surface Water Observations and Field Measurements

Table 14 Surface Water Observations and Field Measurements

Item	Observations
Access	All surface water locations were accessible with the exception of SW150 which could not be located. This location had not been sampled before and was listed in the PMAP as a tap, however, no tap was found at this location. During the sampling event it was identified that SW211 and SW212 were located on private property. These locations have not been included in this factual report as permission was not granted.
Field Observations	Surface water from one location (SW232) had a putrefied odour with biological sheen on the surface. Surface water from one location (SW220) had a septic odour. Surface water from one location (SW203) had a sulfurous odour with biological sheen on the surface. Surface water from seven locations (SW119, SW134, SW140, SW132, SW135, SW113 and SW217) had an organic odour. SW217 also had a biosheen appearance. No other visible or olfactory indications of contamination were observed during the sampling of the surface water locations. Field observations are presented Table T3 in Appendix B .
Geophysical Parameters	Surface water geophysical parameters were measured at the time of sampling. The readings are presented in Table T3 in Appendix B and are summarised below: <ul style="list-style-type: none"> • DO results ranged between 1.92 mg/L (SW203) and 8.93 mg/L (SW227). • EC ranged from 186.9 µS/cm (SW132) to 64,101 µS/cm (SW242) fresh to saline conditions. • pH ranged from 6.53 (SW139) to 8.41 (SW227). pH results generally indicated acidic to neutral conditions. • ORP ranged from -57.1 mV (SW203) to 44.3 mV (SW205) indicating mildly to strongly reducing conditions. • Temperature ranged from 26.6°C (SW139) to 35.7°C (SW119).

4.2.1 PFAS Surface Water Analytical Results

Of the 19 surface water samples, 14 samples reported concentrations of PFAS compounds above the laboratory LOR. The PFAS surface water analytical results from this sampling event are presented in **Table T4** in **Appendix B**. PFOS concentrations in ten samples exceeded the adopted ecological guidelines (**Table T4**, **Appendix B**).

First-time detections and first-time exceedances of guideline values are presented in **Table 15** below.

Table 15 First-time Detections of PFAS or New Exceedances of Guidelines in Surface Water

Type	Surface Water Locations	PFOS concentration (µg/L)		PFOA concentration (µg/L)		PFHxS+PFOS concentration (µg/L)	
		Oct/Nov 2020	Historical maximum	Oct/Nov 2020	Historical maximum	Oct/Nov 2020	Historical maximum
First-time detections of PFOS, PFOA or PFHxS+PFOS in surface water on-Base	SW113	0.22	0.07	0.03**	ND*	0.41	0.17
First-time detections of PFOS, PFOA or PFHxS+PFOS in surface water off-Base	There were no first-time detections of PFOS, PFOA or PFHxS+PFOS in off-Base surface water samples.						
First-time exceedance of the NEMP (HEPA, 2020) 95% species protection ecological screening criteria or recreational water guidelines in surface water on-Base	SW113	0.22^	0.07	0.03	ND	0.41	0.17
	SW119	0.77	0.88	0.07	0.04	2.43	1.24
	SW121	1.19	0.77	0.09	0.06	3.32	1.9

Concentrations have been rounded to two decimal places.

* ND = not detected

**Blue cells denote first time detection above LOR.

^Yellow cells denote new exceedance of guideline values.

4.3 Sediment Observations and Field Measurements

Table 16 Sediment Observations

Item	Observations
Access	All sediment sampling locations were accessible. During the sampling event it was identified that SD211 and SD212 were located on private property. These locations have not been included in this factual report.
Field Observations	Sediment at five locations (SD119, SD121, SD134, SD140 and SD232) had an odour of decaying organic matter. Sediment at two locations (SD139 and SD203) had a sulfurous odour. No other visible or olfactory indications of contamination were observed during the sampling of sediment locations. Sediment logging data are presented in Table T5, Appendix B .

4.3.1 PFAS Sediment Analytical Results

Of the 29 sediment samples, 22 samples reported concentrations of PFAS compounds above the laboratory LOR. The PFAS sediment analytical results from this sampling event are presented in **Table T6 in Appendix B**. First-time detections of PFOA and PFHxS+PFOS in sediment are presented in **Table 17** below and presented on **Figure 5 in Appendix A**. There are no human health or ecological guideline values available for sediment.

Table 17 First-time Detections of PFAS in Sediment

Sediment Locations	PFOA concentration (mg/kg)	PFHxS + PFOS concentration (mg/kg)
SD113	<0.0002	0.0005
SD119	0.0011*	0.0333
SD121^	0.0016	0.0565
SD126^	<0.0002	0.0003
SD128^	<0.0002	0.001
SD129^	<0.0002	0.0005
SD133^	<0.0002	0.0007
SD134^	<0.0002	0.0003
SD135	<0.0002	0.0005
SD136	<0.0002	0.0018
SD233	<0.0002	0.0022
SD242	<0.0002	0.0010

Concentrations have been rounded to four decimal places.

*Blue cells denote first time detection above LOR.

^No historical data are available for this sediment sampling location. The first-time detection is also the first sample collected at this location.

5.0 Summary and Next Sampling Event

5.1 Summary of Monitoring Event

The dry season monitoring event included sampling of groundwater, surface water and sediment both within Lavarack Barracks and the surrounding suburbs between 26 October and 3 November 2020.

Table 18 Summary of Sampling Event

Item	Comment	Recommended Actions
<p><u>Groundwater:</u> Access to sampling locations and monitoring well network condition.</p>	All of the 40 monitoring well locations were accessible and able to be sampled.	No actions recommended.
	The casing of MW003 and MW115 was bent below ground level. A sample was collected using a HydraSleeve™ without a collar.	No actions recommended.
	The monument of MW121 wobbled due to a wash out of the ground below the concrete plinth. The concrete plinth at the base of the monument of MW125_S is cracked.	Repair concrete plinth on MW121 and MW125_S.
	Data loggers were present in the following off-Base wells: <ul style="list-style-type: none"> MW205_S MW232 MW235_S MW236_S. Data loggers were removed to deploy HydraSleeves™ and replaced in the well immediately, on top of the HydraSleeve™. The data loggers were removed a second time during retrieval of the HydraSleeves™ and immediately replaced. A note was left for the owner of the data loggers in each well collar detailing date and time of removal and contact information. HydraSleeves™ were not redeployed in wells with data loggers.	Defence has advised that the owner of the data loggers is unknown. It is recommended that the data loggers be removed and the data downloaded. AECOM to deploy HydraSleeves™ in these wells at the beginning of the subsequent sampling round.
<p><u>Sediment/Surface Water:</u> Access to sampling locations.</p>	29 of the 31 sediment locations and 29 of the 32 surface water locations were accessible. 10 locations were dry, and no surface water sample was able to be collected. These locations were: <ul style="list-style-type: none"> SW109 SW110 SW120 SW126 SW128 SW129 SW130 SW133 SW136 SW137. 	Actions for inaccessible locations detailed below.
	SD/SW211 and SD/SW212 are located on private property. Access to these locations has not been granted by the Property owner.	Access permission for sampling of these locations is to be requested from the stakeholder prior to the next sampling event.

Item	Comment	Recommended Actions
	<p>SW150 was listed in the PMAP for sampling. This location had not been sampled before and was listed as a tap. No tap was found in the location of SW150 as per the PMAP.</p>	<p>Defence to clarify the co-ordinates of this location and verify the sampling point for inclusion in future monitoring rounds. If this sample is to be collected from a tap this location should be renamed as per DCMM Annex L to type "POT" or "OTH" to avoid confusion with surface water body.</p>
<u>Analytical Results</u>	<p>PFAS compounds were detected above laboratory LOR in 39 groundwater samples, 14 surface water samples and 22 sediment samples.</p>	<p>Continue monitoring in accordance with the OMP.</p>
<u>First-time detections of PFOS, PFOA or PFHxS+PFOS</u>	<p><u>Groundwater:</u> Five on-Base groundwater samples (MW116, MW117_D, MW118, MW124, MW125_S) reported first-time detection of PFOS. MW124 also reported first-time detection of PFHxS+PFOS. Three off-Base groundwater sample (MW205_S, MW220_S and MW235_S) reported first-time detections of PFOS. <u>Surface Water:</u> One on-Base surface water sample (SW113) reported first-time detection of PFOA. <u>Sediment:</u> Two sediment samples (SD119 and SD121) reported a first-time detection of PFOA. Twelve sediment samples (SD113, SD119, SD121, SD126, SD128, SD129, SD133, SD134, SD135, SD136, SD233 and SD242) reported first-time detection of PFHxS+PFOS. It is noted that there are no historical data available for SD121, SD126, SD128, SD129, SD133 and SD134 and these first-time detections are also the first time these locations have been sampled.</p>	<p>Continue monitoring in accordance with the OMP.</p>
<u>First-time exceedances of screening criteria for PFOS, PFOA or PFHxS+PFOS</u>	<p><u>Groundwater:</u> One on-Base (MW120) and one off-Base (MW232) groundwater sample reported first-time exceedance of the NEMP (HEPA, 2020) 95% Species Protection for groundwater for PFOS. <u>Surface Water:</u> One on-Base surface water sample (SW113) reported first-time exceedance of the NEMP (HEPA, 2020) 95% Species Protection for PFOS in surface water. Two on-Base surface water samples (SW119 and SW121) reported first-time exceedance of the NEMP (HEPA, 2020) recreational water guidelines for PFHxS+PFOS.</p>	<p>No actions recommended.</p>

5.2 Upcoming Sampling Events

The next biannual sampling event is scheduled for late March / early April 2021.

5.3 Upcoming Annual Interpretive Report

The next annual interpretive report is scheduled for June 2021.

6.0 References

AECOM. (2020). *Sampling Analysis and Quality Plan - PFAS OMP Lavarack Barracks*.

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Appendix A

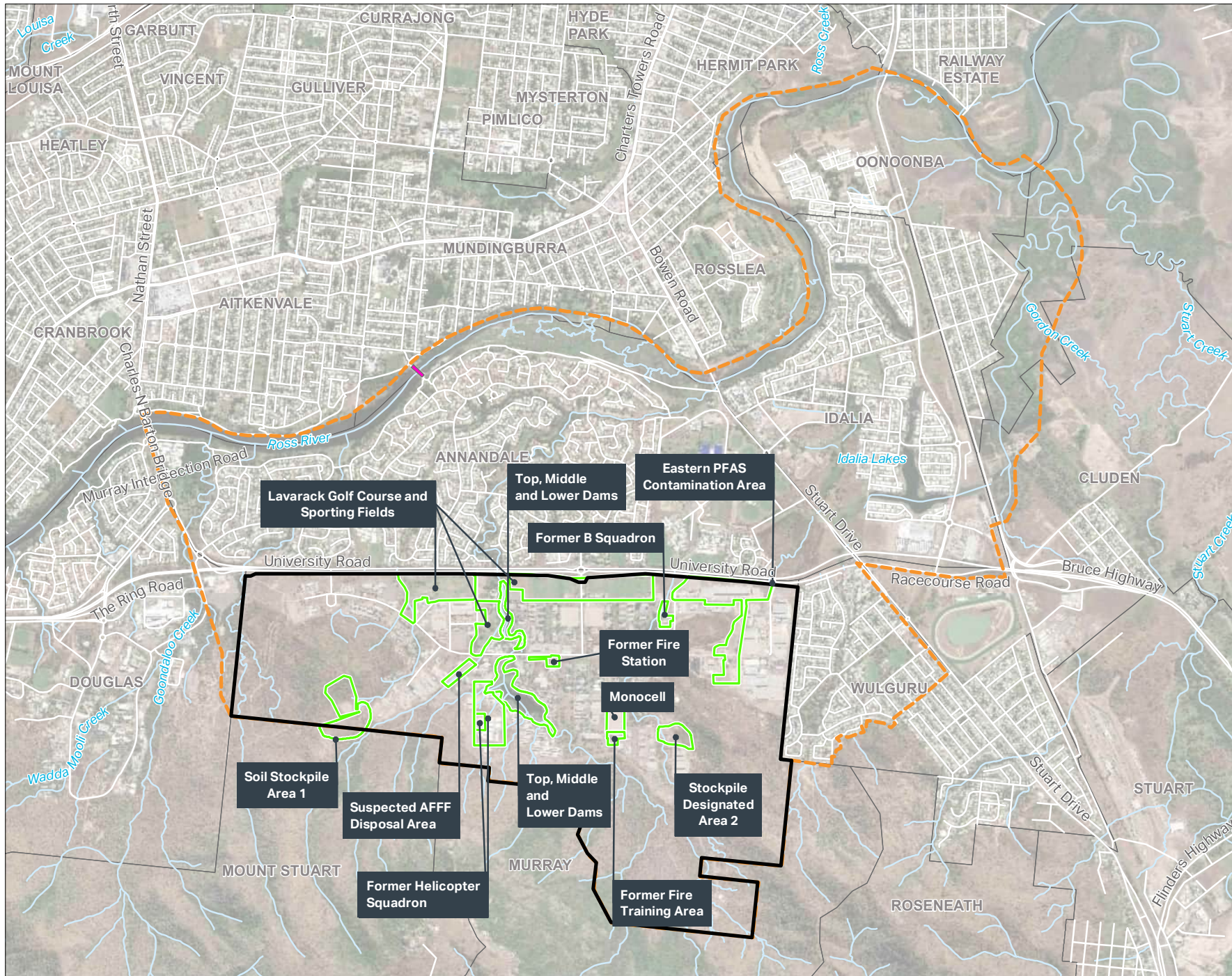
Figures

Appendix A Figures

- Figure 1 Lavarack Barracks Location and Source Areas**
- Figure 2 Groundwater Monitoring Locations**
- Figure 3 Surface Water and Sediment Monitoring Locations**
- Figure 4 Inferred Groundwater Contours**
- Figure 5a Groundwater First Time PFAS Detection and Exceedances of Guideline Values**
- Figure 5b Surface Water First Time PFAS Detection and Exceedances of Guideline Values**
- Figure 5c Sediment First Time PFAS Detection and Exceedances of Guideline Values**

Legend

- Management Area
- Watercourse_lines_...
- Watercourse_lin...
- Sub-Management Area Boundary
- Aplin's Weir
- Source Areas



**FIGURE 1:
LAVARACK BARRACKS
LOCATION AND
SOURCE AREAS**

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PFAS OMP
REPORT NAME:
PFAS OMP – Lavarack Barracks
(0229) Townsville,
Sample Event Factual Report
October 2020
CLIENT NAME:
Department of Defence
PROJECT NUMBER:
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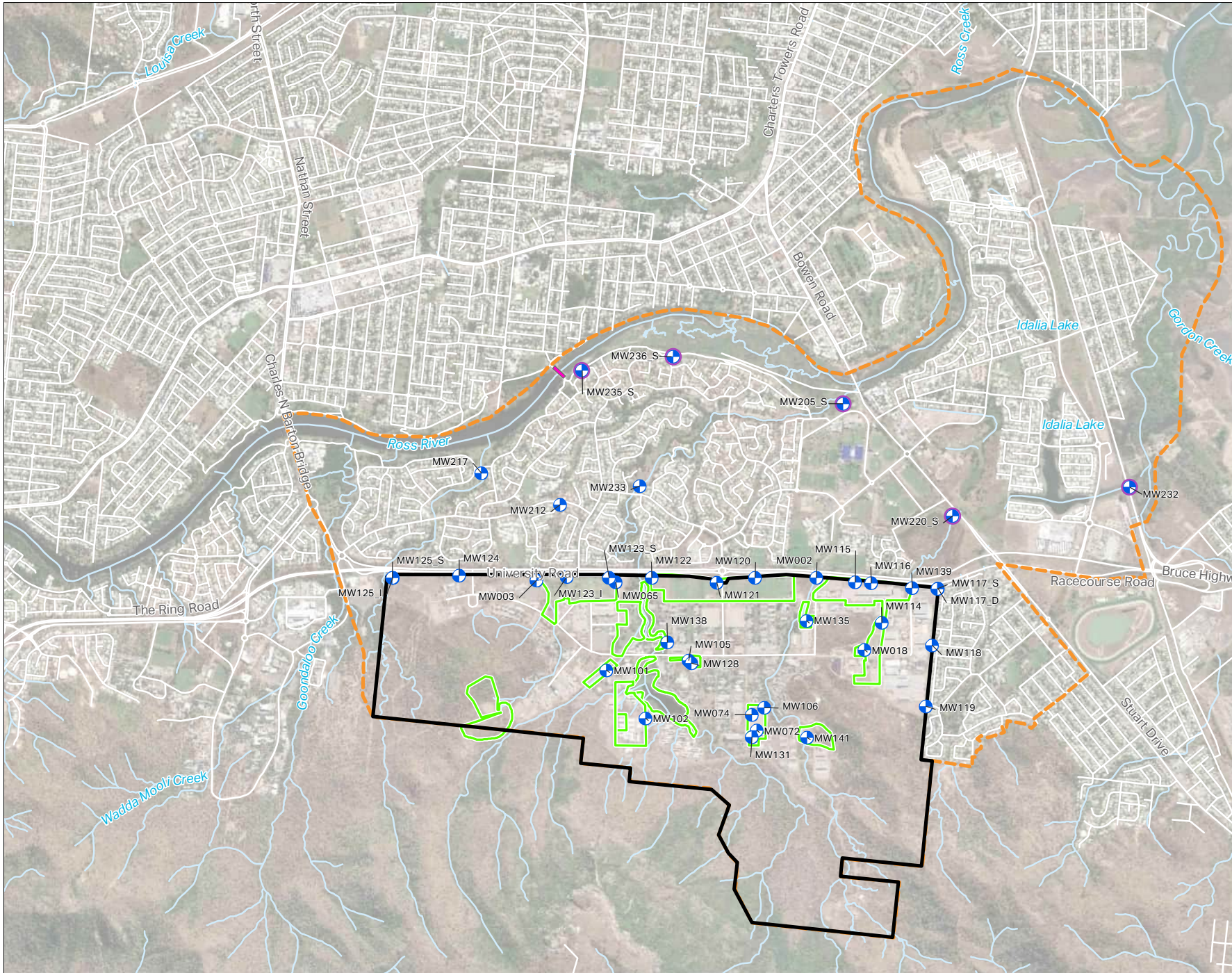
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Legend

- Management Area
- Sub-Management Area Boundary
- Aplin's Weir
- Source Areas
- Groundwater Sample Location
- Tidally Influenced Groundwater Sample Location



**FIGURE 2:
GROUNDWATER
MONITORING LOCATIONS**

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PFAS OMP
REPORT NAME:
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(0229) Townsville,
Sample Event Factual Report
October 2020
CLIENT NAME:
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PROJECT NUMBER:
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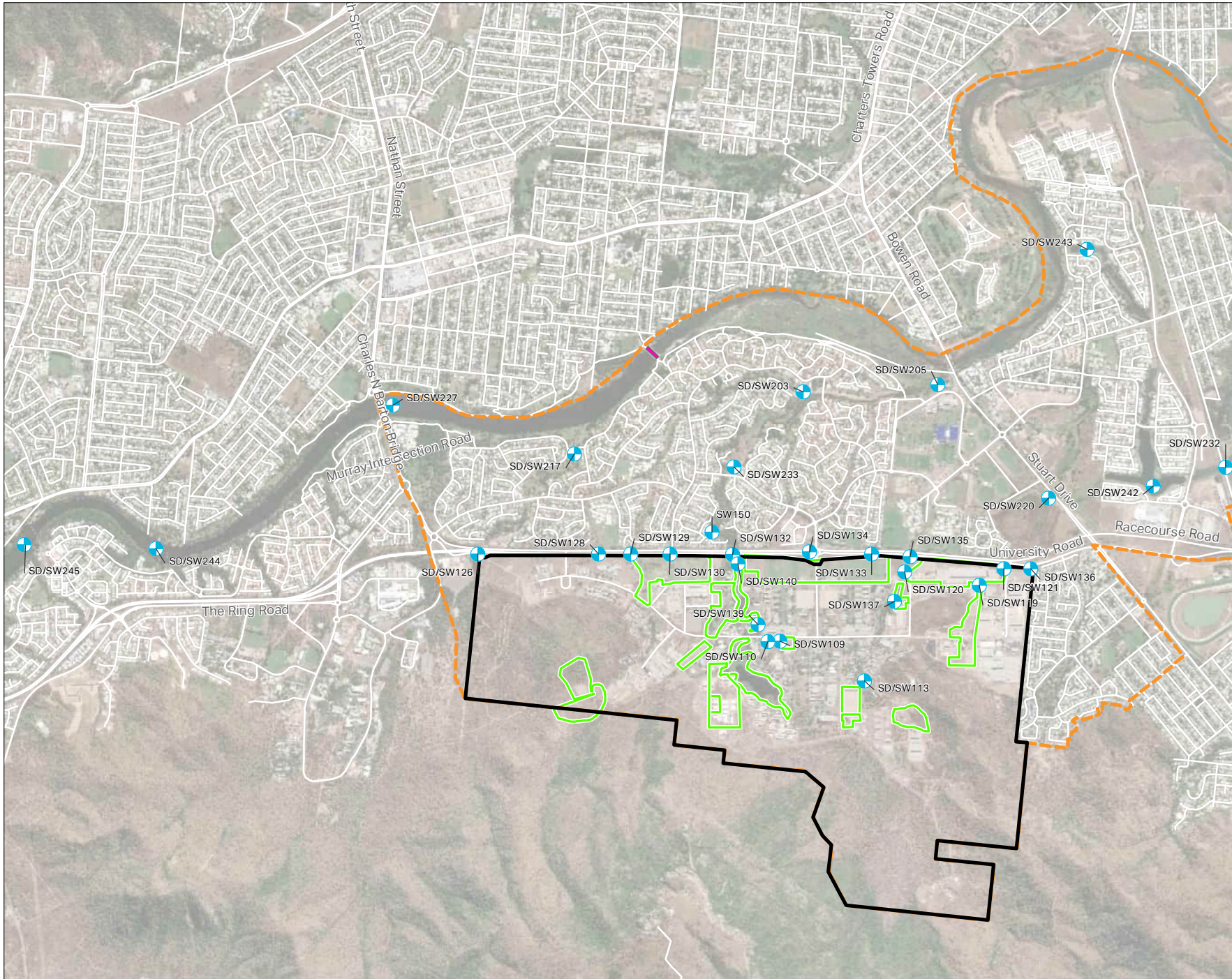
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0 350 700 m

Legend

- Management
- Sub-Management Area Boundary
- Aplin's Weir
- Source
- Co-located Surface Water and Sediment Sample Location



**FIGURE 3:
SURFACE WATER AND
SEDIMENT MONITORING
LOCATIONS**

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PFAS OMP
REPORT NAME:
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(0229) Townsville,
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Legend

- Management Area
- Sub-Management Area Boundary
- Aplin's Weir
- Source Areas
- Groundwater Contour
- Inferred Groundwater Flow Direction
- Groundwater Monitoring Well

Note: All elevations are in m AHD

**FIGURE 4:
INFERRED
GROUNDWATER
CONTOURS-
SHALLOW AQUIFER
(ALLUVIUM)**

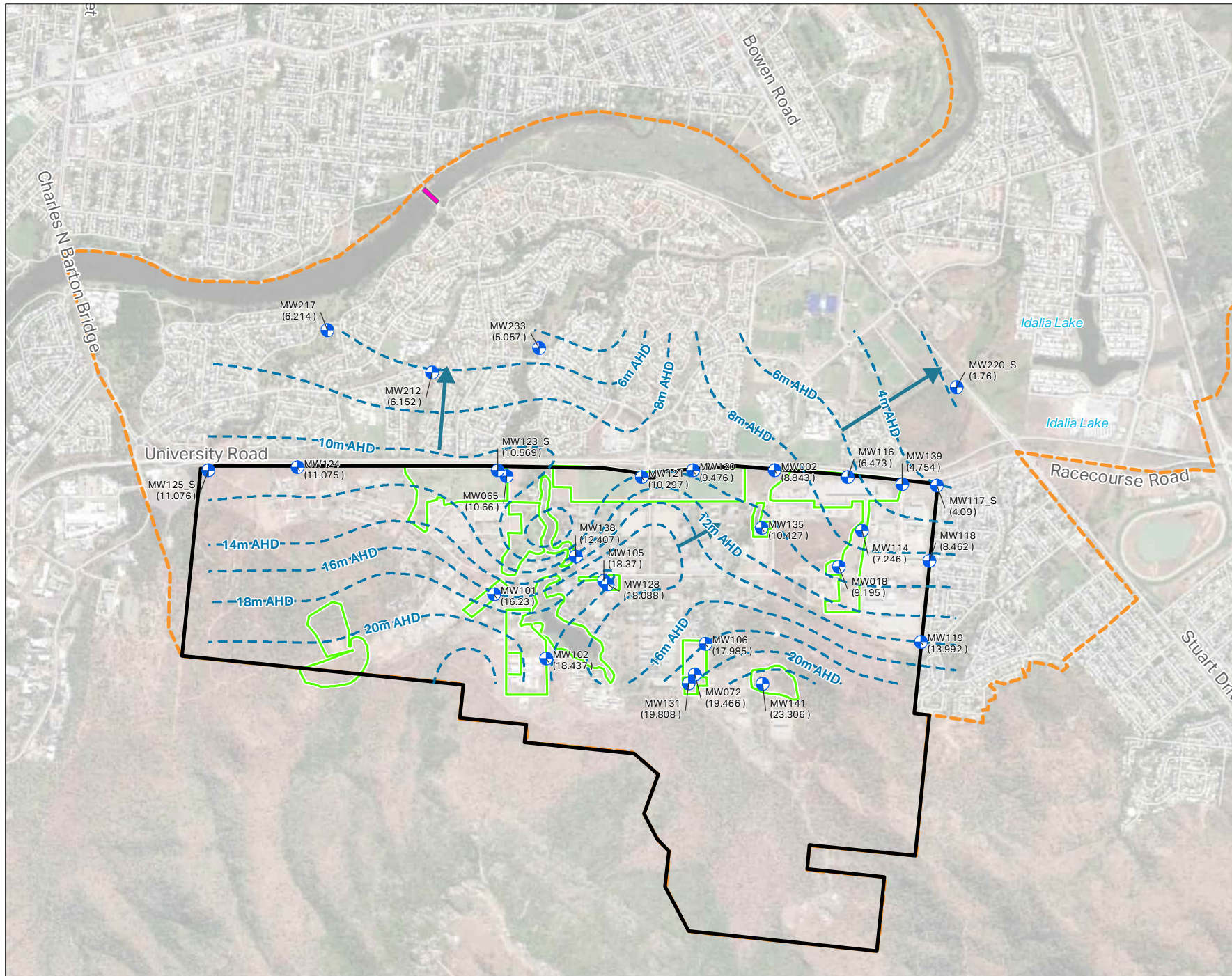
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Legend

- Management Area
- Sub-Management Area Boundary
- Aplin's Weir
- Source Areas
- First time detection of PFOS+PFHxS or PFOA above laboratory limit of reporting
- First time exceedance of guidelines for PFOS+PFHxS, PFOA or PFOS

FIGURE 5A:
GROUNDWATER, FIRST TIME PFAS DETECTION AND EXCEEDANCES OF GUIDELINE VALUES

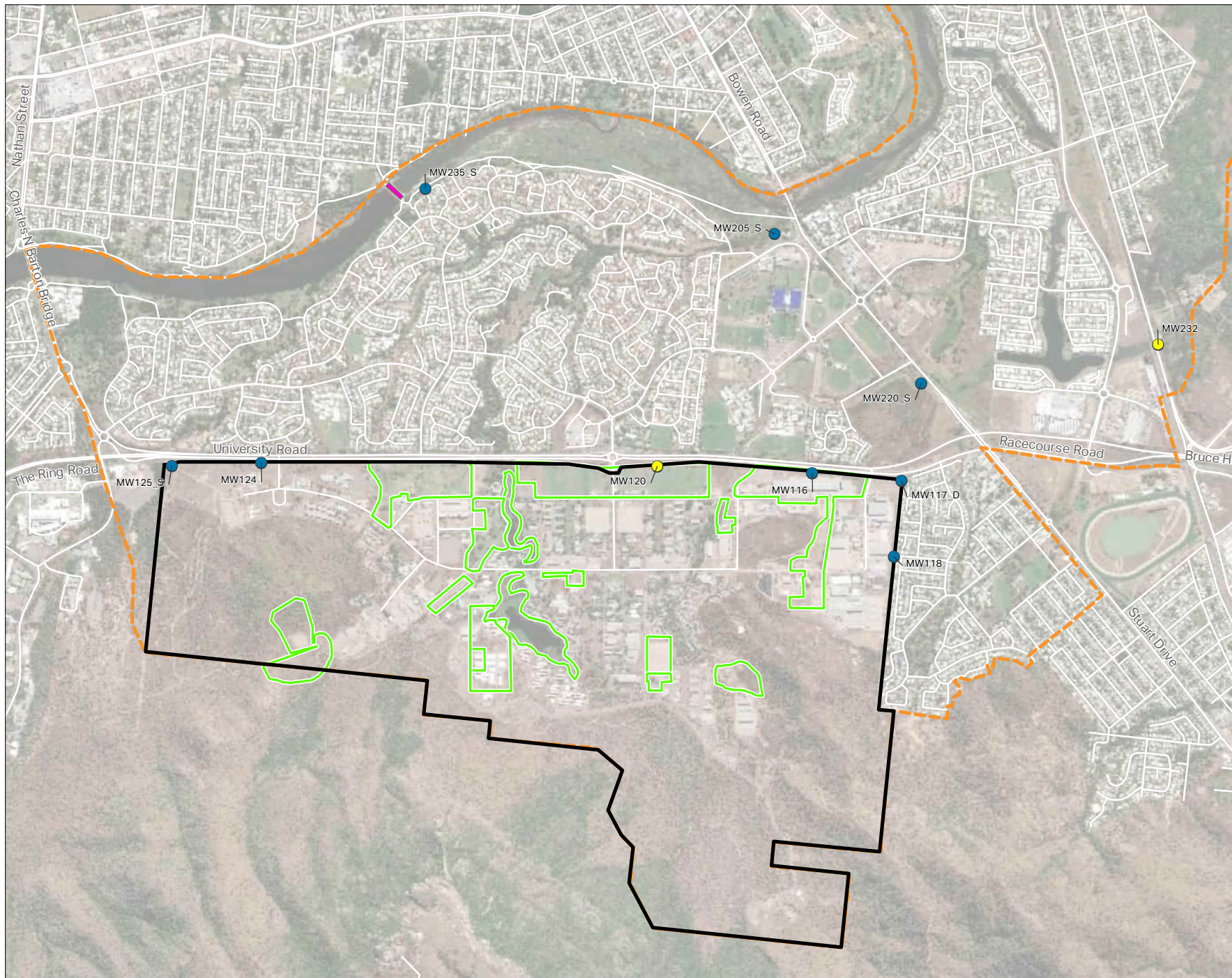
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Legend

- Management Area
- Sub-Management Area Boundary
- Aplin's Weir
- Source Areas
- First time exceedance of guidelines for PFOS+PFHxS, PFOA or PFOS

**FIGURE 5B:
SURFACE WATER,
FIRST TIME PFAS
DETECTION AND
EXCEEDANCES
OF GUIDELINE VALUES**

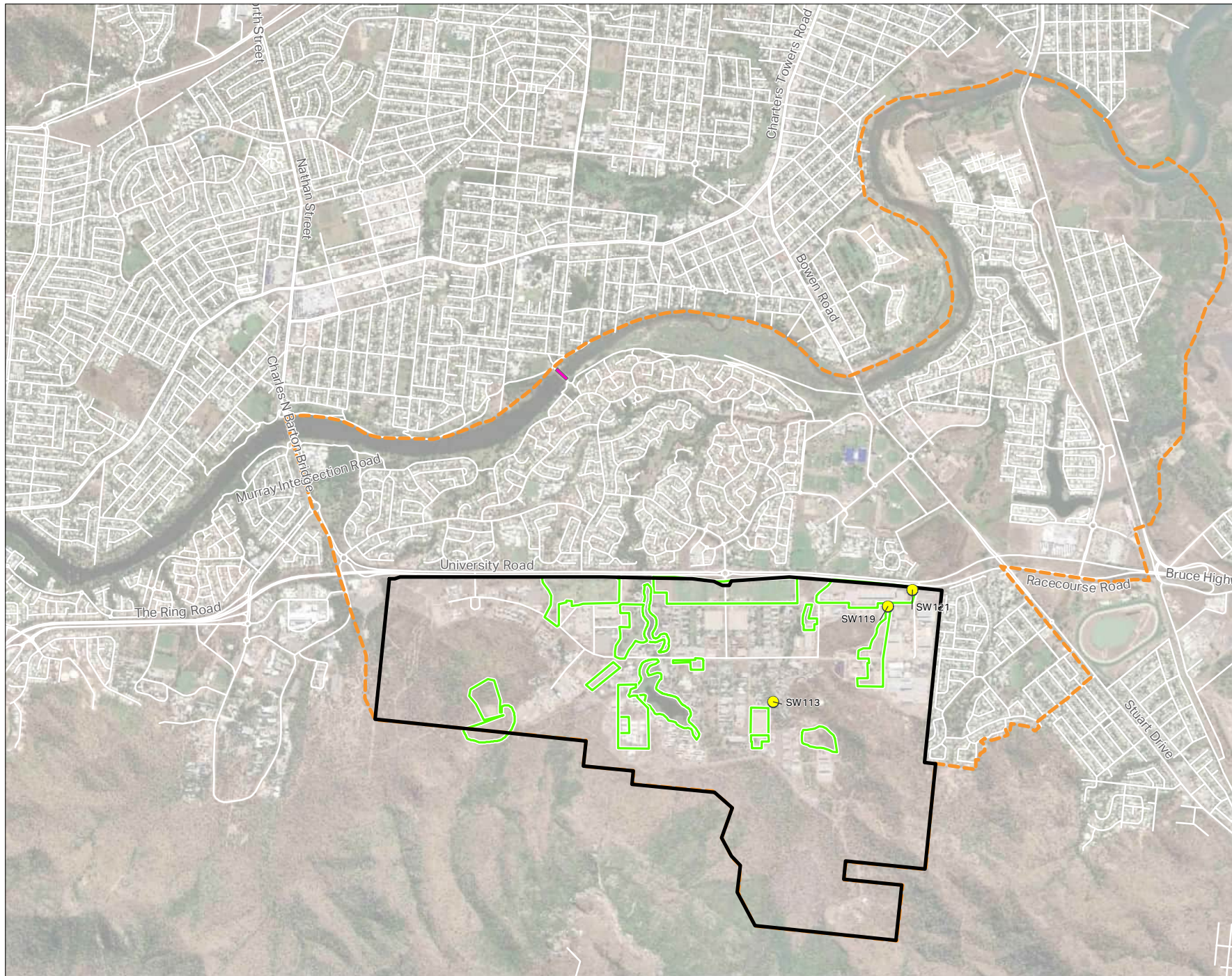
PROJECT NAME:
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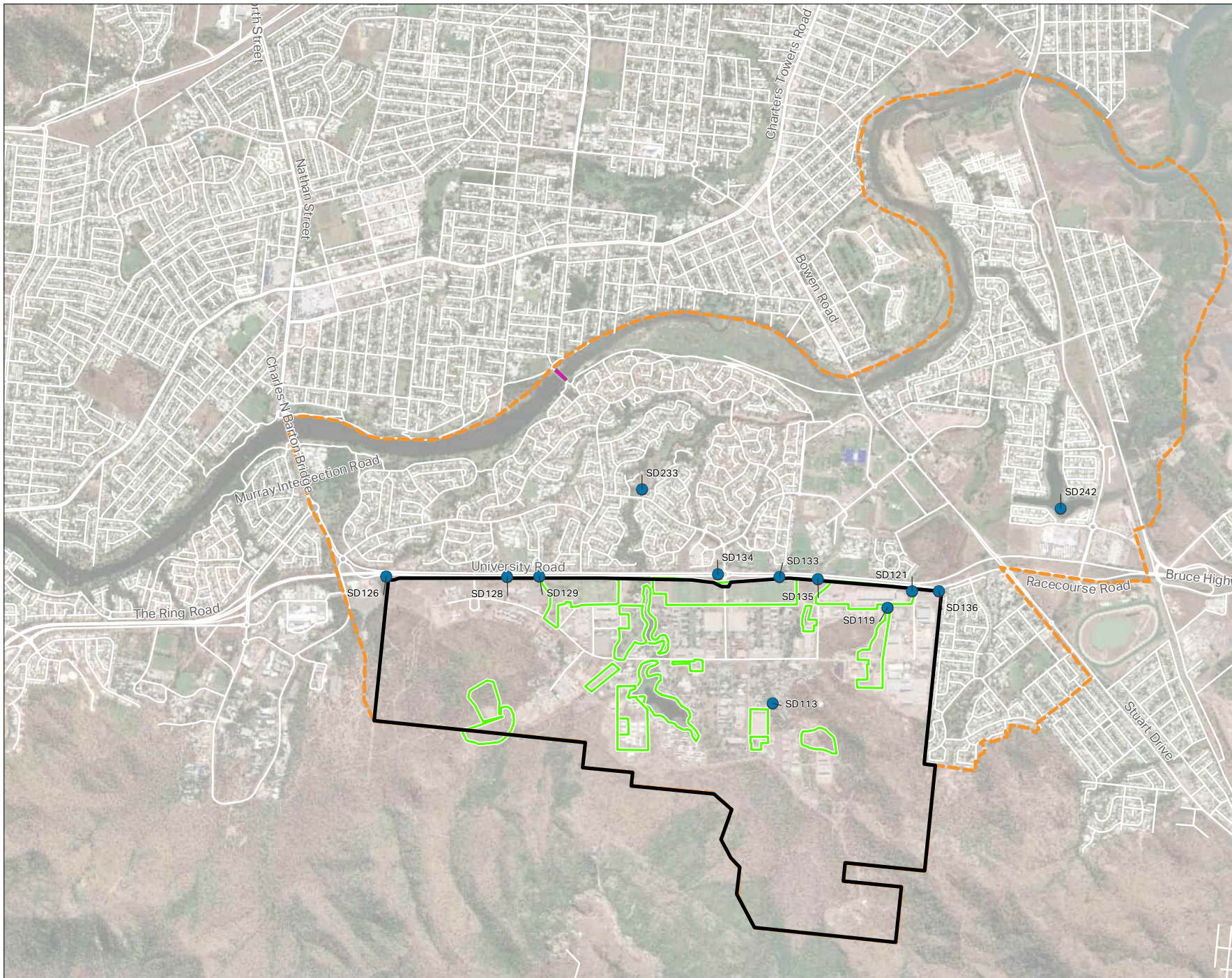
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Legend

- Management Area
- Sub-Management Area Boundary
- Aplin's Weir
- Source Areas
- First time detection of PFOS+PFHxS
- or PFOA above laboratory limit of reporting



**FIGURE 5C:
SEDIMENT,
FIRST TIME DETECTION
ABOVE LABORATORY
LIMIT OF REPORTING**

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PFAS OMP
REPORT NAME:
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Appendix B

Tables

Appendix B Tables

Table T1	Groundwater Gauging and Field Parameter Results
Table T2	Groundwater PFAS Analytical Results
Table T3	Surface Water Parameter Results
Table T4	Surface Water PFAS Analytical Results
Table T5	Sediment Field Observations
Table T6	Sediment PFAS Analytical Results

Table T1: Groundwater Gauging and Field Parameter Results

Field ID	Location Code	HydraSleeve Installation Date	Sample Date	Well Screen Depths (mbtoc)	Well Depth (mbtoc)	Depth to Water (mbtoc)	HydraSleeve Installation Depth (mbTOC)*	TOC Elevation (mAHD)	Groundwater Elevation (mAHD)	Condition of Well	DO (mg/L)	EC (µS/cm)	pH	Eh/Redox (mV)	Temp (°C)	Turbidity	Turbidity Value (NTU)	Water Colour	Odour	Sheen	Sample Method/Comments
Eastern PFAS Contamination Area																					
0229_MW018_201028	MW018	26/10/2020	28/10/2020	Not available in ESdat	9.05	3.235	8.05	12.43	9.195	Good	1.8	12408	6.77	35.5	29.2	Clear	4.96	Clear	No odour	No sheen	Weather: Clear, Humid
0229_MW114_201028	MW114	26/10/2020	28/10/2020	Not available in ESdat	6.68	1.654	5.68	8.9	7.246	Good	1.81	20282	7.47	34.7	28.5	Low	126.61	Clear	No odour	No sheen	Weather: Clear, Humid
0229_MW115_201028	MW115	26/10/2020	28/10/2020	12.7 - 15.7	15.62	2.489	14.62	9.76	7.271	Good	1.46	1379	7.55	-57.5	29.7	Medium	54.35	Grey / Brown	Rotten egg smell (sulfurous)	No sheen	Re-deployed without collar, casing bent at approx 0.75mbtoc, hydrasleeve and bailer would not get past bent casing, Weather: Clear, Humid
0229_MW116_201028	MW116	26/10/2020	28/10/2020	5 - 8	7.88	2.137	6.88	8.61	6.473	Good	2.38	16977	7.24	74.8	29	Clear	24.43	Clear	Slight Organic Odour	No sheen	Weather: Clear, Humid
0229_MW139_201028	MW139	26/10/2020	28/10/2020	2.8 - 5.8	5.76	1.776	4.76	6.53	4.754	Good	1.65	10204	6.76	70.5	29	Clear	15.64	Clear	No odour	No sheen	Weather: Clear, Humid
Former B Squadron																					
0229_MW135_201028	MW135	26/10/2020	28/10/2020	3 - 6	6.365	4.533	5.365	14.96	10.427	Good	2.44	3545	6.51	40.2	30.5	Low	94.3	Yellow / Brown	No odour	No sheen	Weather: Clear, Humid
Former Fire Station																					
0229_MW105_201029	MW105	27/10/2020	29/10/2020	3 - 6	6.29	2.83	5.29	21.2	18.37	Good	2.01	4765	6.34	20.9	28.5	Low	57.51	Light Brown	No odour	No sheen	Weather: Clear, Humid
0229_MW128_201029	MW128	27/10/2020	29/10/2020	2.6 - 5.6	5.47	3.192	4.47	21.28	18.088	Good	3.52	53.3	6.79	51.4	27.2	Clear	60.73	Clear	No odour	No sheen	Weather: Clear, Humid
Former Fire Training Area																					
0229_MW131_201028	MW131	27/10/2020	28/10/2020	5.4 - 8.4	8.7	5.432	7.7	25.24	19.808	Good	2.8	1402	6.77	-21.2	29.1	Medium	109.82	Grey	Slight Organic Odour	No sheen	Tree roots blocked well at 5.1mbtoc, removed with steel bailer. Plover nest nearby, Weather: Clear, Humid
Former Helicopter Squadron																					
0229_MW102_201029	MW102	27/10/2020	29/10/2020	8.5 - 14.5	9.81	4.433	8.81	22.87	18.437	Good	2.85	6134	6.55	44.7	29.6	Low	41.26	Light Brown	No odour	No sheen	Weather: Clear, Humid
Lavarack Golf Course & Sporting Field																					
0229_MW065_201029	MW065	27/10/2020	29/10/2020	1.5 - 6	6.5	2.76	5.5	13.42	10.66	Good	1.56	4534	6.69	36.3	29.7	Clear	19.54	Clear	No odour	No sheen	Dead ants in well, Well cap dislodged on arrival, Weather: Clear, Humid
0229_MW120_201029	MW120	26/10/2020	29/10/2020	4 - 7	7.58	3.844	6.58	13.32	9.476	Good	2.63	13269	5.84	29.5	29	Clear	7	Clear	No odour	No sheen	Weather: Clear, Humid
0229_MW121_201029	MW121	26/10/2020	29/10/2020	2.5 - 5.8	6.39	3.373	5.39	13.67	10.297	Good	3.41	8597	6.72	14.6	28	Clear	3.02	Clear	No odour	No sheen	Wobbly monument, Weather: Clear, Humid
0229_MW122_201029	MW122	27/10/2020	29/10/2020	9.3 - 16.3	16.9	4.906	15.9	14.44	9.534	Damaged	3.02	1529	6.3	44.5	27.8	Low	78.32	Clear	No odour	No sheen	10cm of silty sediment in the bottom of hydrasleeve, Weather: Clear, Humid
0229_MW123_I_201028	MW123_I	27/10/2020	28/10/2020	5.8 - 8.8	10.11	2.78	9.11	14.04	11.26	Good	1.44	26700	6.79	48.3	27.5	Clear	17.24	Clear	Rotten egg smell (sulfurous)	No sheen	Weather: Clear, Humid
0229_MW123_S_201029	MW123_S	27/10/2020	29/10/2020	1 - 5	5.6	2.911	4.6	13.48	10.569	Good	2.01	2180	6.95	6	28.2	Low	13.03	Clear	No odour	No sheen	Weather: Clear, Humid
Monocell																					
0229_MW072_201028	MW072	26/10/2020	28/10/2020	Not available in ESdat	7.928	5.964	6.928	25.43	19.466	Good	2.31	1980	6.93	96.4	31	Clear	52.28	Clear	No odour	No sheen	Weather: Clear, Humid
0229_MW074_201028	MW074	26/10/2020	28/10/2020	Not available in ESdat	7.13	4.967	6.13	Not available in ESdat	N/A	Good	2.31	1980	6.93	96.4	31	Clear	52.28	Clear	No odour	No sheen	Weather: Clear, Humid
0229_MW106_201028	MW106	26/10/2020	28/10/2020	2.5 - 8.5	10.14	5.855	9.14	23.84	17.985	Good	2.33	1987	7.08	73.3	28.2	Clear	2.6	Clear	No odour	No sheen	Weather: Clear, Humid
Stockpile Designated Area 2																					
0229_MW141_201028	MW141	27/10/2020	28/10/2020	Not available in ESdat	8.815	4.884	7.815	28.19	23.306	Good	3.02	1714	6.73	60.2	27.8	Clear	23.3	Clear	No odour	No sheen	Weather: Clear, Humid
Suspected AFFF Disposal Area																					
0229_MW101_201029	MW101	27/10/2020	29/10/2020	5 - 9	6.87	5	5.87	21.23	16.23	Good	2.05	1928	5.99	-66.4	29.4	Turbid	425.58	Brown	Organic Odour	No sheen	Blocked by tree roots at 4.188mbtoc, cleared with steel bailer, Hydrasleeve not re-deployed, Weather: Clear, Humid
Top, Middle and Lower Dams																					
0229_MW138_201029	MW138	27/10/2020	29/10/2020	6 - 9	9.07	4.083	8.07	16.49	12.407	Good	2.76	38.1	6.27	30.9	27	Low	151.16	Clear	No odour	No sheen	Weather: Clear, Humid
Base Boundary																					
0229_MW002_201028	MW002	26/10/2020	28/10/2020	Not available in ESdat	5.21	2.507	4.21	11.35	8.843	Good	6.95	689	7.29	70.3	27.6	Clear	48.15	Clear	No odour	No sheen	Weather: Clear, Humid

Table T1: Groundwater Gauging and Field Parameter Results

Field ID	Location Code	HydraSleeve Installation Date	Sample Date	Well Screen Depths (mbtoc)	Well Depth (mbtoc)	Depth to Water (mbtoc)	HydraSleeve Installation Depth (mbTOC)*	TOC Elevation (mAHD)	Groundwater Elevation (mAHD)	Condition of Well	DO (mg/L)	EC (µS/cm)	pH	Eh/Redox (mV)	Temp (°C)	Turbidity	Turbidity Value (NTU)	Water Colour	Odour	Sheen	Sample Method/Comments
0229_MW003_201029	MW003	27/10/2020	29/10/2020	Not available in ESdat	-	3.696	-	13.95	10.254	Good	2.36	3751	6.43	7.5	27.3	Clear	8.94	Clear	No odour	No sheen	Total depth >30mbtoc, IP didn't reach. Well was bent below ground level and hydrasleeve collar would not pass bend. Hydrasleeve deployed without a collar. Weather: Clear, Humid
0229_MW117_D_201028	MW117_D	27/10/2020	28/10/2020	15 - 20	19.75	1.922	18.75	5.95	4.028	Good	3.2	8431	6.79	57.2	27.9	Clear	15.15	Clear	No odour	No sheen	Weather: Clear, Humid
0229_MW117_S_201028	MW117_S	27/10/2020	28/10/2020	2.9 - 5.9	5.85	1.87	4.85	5.96	4.09	Good	2.22	9351	7.61	29.4	28.2	Low	42.42	Light Brown	No odour	No sheen	Weather: Clear, Humid
0229_MW118_201028	MW118	27/10/2020	28/10/2020	3 - 6	6.02	2.078	5.02	10.54	8.462	Good	2.56	6156	7.24	54	27.8	Clear	9.33	Clear	No odour	No sheen	Weather: Clear, Humid
0229_MW119_201028	MW119	27/10/2020	28/10/2020	5.4 - 10.4	10.41	4.788	9.41	18.78	13.992	Good	2.48	10420	6.46	82.4	27.3	Clear	7.62	Clear	No odour	No sheen	Weather: Clear, Humid
0229_MW124_201102	MW124	30/10/2020	2/11/2020	3 - 6	7.89	3.335	6.89	14.41	11.075	Good	1.68	27891	6.52	40	29.7	Clear	44.5	Clear	No odour	No sheen	Weather: Clear, Humid
0229_MW125_I_201102	MW125_I	30/10/2020	2/11/2020	5.8 - 8.8	21.92	5.727	20.92	16.67	10.943	Good	1.45	3591	6.59	73.2	28.6	Medium	115.46	Light Brown	No odour	No sheen	Concrete around monument cracked. Weather: Clear, Humid
0229_MW125_S_201102	MW125_S	30/10/2020	2/11/2020	1 - 5	7.71	5.604	6.71	16.68	11.076	Good	2.3	3879	6.71	112.5	27.5	Clear	27.62	Clear	No odour	No sheen	Weather: Clear, Humid
Off-Base																					
0229_MW205_S_201103	MW205_S	2/11/2020	3/11/2020	8 - 11	8.8	5.797	7.8	6.4	0.603	Good	2.31	220.3	6.21	-67.3	28.6	Low	59.35	Light Grey	Rotten egg smell (sulfurous)	No sheen	Dead ants, data logger present. Hydrasleeve not redeployed, Weather: Clear, Humid
0229_MW212_201103	MW212	2/11/2020	3/11/2020	6 - 9	8.86	2.158	7.86	8.31	6.152		1.81	25835	6.44	28.1	28.6	Clear	17.45	Clear	No odour	No sheen	Weather: Clear, Humid
0229_MW217_201103	MW217	2/11/2020	3/11/2020	3 - 6	5.45	1.136	4.45	7.35	6.214	Good	1.77	6495	5.87	26.2	26.8	Low	61.47	Other	No odour	No sheen	Orange in colour with orange sediment in hydrasleeve, Weather: Clear, Humid
0229_MW220_S_201103	MW220_S	2/11/2020	3/11/2020	2 - 5	6.02	1.99	5.02	3.75	1.76	Good	1.44	37387	5.76	50.2	27.3	Low	26	Other	No odour	No sheen	Orange brown colour with iron flecks gathered in bottom of hydrasleeve, Weather: Clear, Humid
0229_MW226_201029	MW226	28/10/2020	29/10/2020	Not available in ESdat	5.85	1.358	4.85	Not available in ESdat	N/A	Good	1.97	17449	5.81	30.8	26.2	Low	8.44	Clear	No odour	No sheen	Irrigation bore at Southern Cross Catholic College. no well cap, Weather: Clear, Humid
0229_MW232_201103	MW232	2/11/2020	3/11/2020	1 - 4	3.03	0.565	2.03	2.31	1.745	Good	1.53	51290	5.5	31.7	29.1	Medium	162.2	Other	No odour	No sheen	Orange in colour, data logger in well., Weather: Clear, Humid
0229_MW233_201103	MW233	2/11/2020	3/11/2020	4.2 - 7.2	7.56	1.813	6.56	6.87	5.057	Good	1.83	5834	6.6	11.1	26.6	Clear	21.15	Clear	Rotten egg smell (sulfurous)	No sheen	Weather: Clear, Humid
0229_MW235_S_201103	MW235_S	2/11/2020	3/11/2020	4.1 - 8.1	7.94	5.498	6.94	7.08	1.582		1.66	1565	6.06	-22.8	27.7	Medium	114.27	Light Brown	Rotten egg smell (sulfurous)	No sheen	Data logger in well. tree roots dislodged with steel bailer. hydrasleeve not redeployed, Weather: Clear, Humid
0229_MW236_S_201103	MW236_S	2/11/2020	3/11/2020	4 - 7	6.92	5.809	5.92	6.53	0.721	Good	7.93	7.4	5.92	80.7	27.6	Medium	277.59	Yellow / Brown	No odour	No sheen	Data logger in well, Weather: Clear, Humid

mbtoc - metres below top of casing
 TOC - top of casing
 mAHD - metres above Australian Height Datum
 DO - Dissolved Oxygen
 EC - Electrical Conductivity
 Eh - Redox Oxidation Potential
 Temp - Temperature
 mg/L - milligrams per litre
 µS/cm - microsiemens per centimeter

NTU - Nephelometric Turbidity Unit
 °C - degrees Celsius
 "-" denotes no analysis taken
 mV - millivolt

* Depth at which collar of the HydraSleeve was installed.

Table T2: Groundwater PFAS Analytical Results

	4:2 FTS	6:2 FIS	8:2 FTS	10:2 FTS	EtFOA	EtFOAA	EtFOSE	FOSA	MeFOA	MeFOAA	MeFOSE	PFBS	PFPeS	PFHxS	PFHpS	PFOS	PFDS	PFBA	PFHxA	PFPeA	PFHpA	PFOA	PFDA	PFDoDA	PFNA	PFTeDA	PFTrDA	PFUnDA	Sum of PFHxS and PFOS	Sum of PFAS		
Units	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L		
LOR	0.05	0.05	0.05	0.05	0.05	0.02	0.05	0.02	0.02	0.05	0.02	0.05	0.02	0.01	0.02	0.01	0.1	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.05	0.02	0.02	0.02	0.02	0.02		
PFAS NEMP 2020 Drinking Water Guideline (Off-Base only) (HEPA, 2020)																														0.56	0.07	
PFAS NEMP 2020 Freshwater and Marine 95% Species Protection (HEPA, 2020)																0.13															220	

Field ID	Location Code	Sample Date	4:2 FTS	6:2 FIS	8:2 FTS	10:2 FTS	EtFOA	EtFOAA	EtFOSE	FOSA	MeFOA	MeFOAA	MeFOSE	PFBS	PFPeS	PFHxS	PFHpS	PFOS	PFDS	PFBA	PFHxA	PFPeA	PFHpA	PFOA	PFDA	PFDoDA	PFNA	PFTeDA	PFTrDA	PFUnDA	Sum of PFHxS and PFOS	Sum of PFAS		
Eastern PFAS Contamination Area																																		
0229_MW018_201028	MW018	28/10/2020	<0.1	<0.1	<0.1	<0.1	<0.25	<0.1	<0.04	<0.1	<0.25	<0.1	<0.25	2.97	2.79	15.3	1.11	22.1	<0.1	0.8	5.61	1.09	0.78	1.12	<0.1	<0.1	<0.1	<0.25	<0.1	<0.1	37.4	53.7		
0229_MW114_201028	MW114	28/10/2020	<0.05	<0.05	<0.05	<0.05	<0.1	<0.04	<0.1	<0.04	<0.1	<0.04	<0.1	0.92	0.94	5.29	0.21	0.48	<0.04	0.3	2.2	0.4	0.33	0.39	<0.04	<0.04	<0.04	<0.1	<0.04	<0.04	5.77	11.5		
0229_MW115_201028	MW115	28/10/2020	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.1	<0.02	<0.05	<0.02	<0.05	0.44	0.12	0.54	0.02	0.55	<0.02	<1.1	0.26	<0.1	<0.02	0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	1.09	1.95		
0229_MW116_201028	MW116	28/10/2020	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.02	<0.05	0.06	0.03	0.07	<0.02	0.01	<0.02	<0.1	0.03	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	0.08	0.2		
0229_MW139_201028	MW139	28/10/2020	<0.05	0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.02	<0.05	0.1	0.13	1.32	0.06	2.04	<0.02	<0.1	0.12	0.03	<0.02	0.04	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	3.36	3.89		
Former B Squadron																																		
0229_MW135_201028	MW135	28/10/2020	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.02	<0.05	0.13	0.13	1.73	0.13	2.37	<0.02	<0.1	0.11	<0.1	0.02	0.07	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	4.1	4.69		
Former Fire Station																																		
0229_MW105_201029	MW105	29/10/2020	<0.07	0.24	<0.07	<0.07	<0.17	<0.07	<0.17	<0.07	<0.17	<0.07	<0.17	4.52	5	37.6	1.71	25.8	<0.07	0.7	11.2	1.78	1.02	1.65	<0.07	<0.07	0.11	<0.17	<0.07	<0.07	63.4	91.3		
0229_MW128_201029	MW128	29/10/2020	<0.7	<0.7	<0.7	<0.7	<1.75	<0.7	<1.75	<0.7	<1.75	<0.7	<1.75	24.3	28	248	21.5	483	<0.7	3.8	58.8	10.4	6.58	17.8	<0.7	<0.7	17.2	<1.75	<0.7	<0.7	731	919		
Former Fire Training Area																																		
0229_MW131_201028	MW131	28/10/2020	<0.05	0.07	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.02	<0.05	0.53	0.44	2.95	0.21	5.88	<0.02	<0.5	1.08	0.2	0.17	0.28	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	8.83	11.8		
Former Helicopter Squadron																																		
0229_MW102_201029	MW102	29/10/2020	<0.05	0.12	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.02	<0.05	0.13	0.08	0.54	0.03	0.88	<0.02	<0.1	0.06	<0.02	<0.02	0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	1.42	1.86		
Lavarack Golf Course & Sporting Field																																		
0229_MW065_201029	MW065	29/10/2020	<0.05	<0.05	<0.05	<0.05	<0.09	<0.03	<0.09	<0.03	<0.09	<0.03	<0.09	0.36	0.45	7.17	0.27	8.23	<0.03	<0.2	1.47	0.2	0.09	0.18	<0.03	<0.03	<0.03	<0.09	<0.03	<0.03	15.4	18.4		
0229_MW120_201029	MW120	29/10/2020	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.02	<0.05	0.1	<0.02	0.13	<0.02	0.14	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.05	<0.02	<0.02	0.27	0.37			
0229_MW121_201029	MW121	29/10/2020	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.02	<0.05	0.05	0.04	0.33	<0.02	0.06	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.05	<0.02	<0.02	0.39	0.48			
0229_MW122_201029	MW122	29/10/2020	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.02	<0.05	0.13	0.1	0.76	0.05	1.89	<0.02	<0.1	0.09	<0.02	<0.02	0.05	<0.02	<0.02	<0.05	<0.02	<0.02	2.65	3.07			
0229_MW123_I_201028	MW123_I	28/10/2020	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.02	<0.05	0.3	0.22	0.7	<0.02	<0.01	<0.02	<0.1	0.13	0.03	<0.02	<0.01	<0.02	<0.02	<0.05	<0.02	<0.02	0.7	1.38			
0229_MW123_S_201029	MW123_S	29/10/2020	<0.05	<0.05	<0.05	<0.05	<0.09	<0.03	<0.09	<0.03	<0.09	<0.03	<0.09	0.86	0.76	9.96	0.99	2.64	<0.03	0.2	1.13	0.2	0.16	0.51	<0.03	<0.03	<0.03	<0.09	<0.03	<0.03	12.6	17.4		
Monocell																																		
0229_MW072_201028	MW072	28/10/2020	<0.47	<0.47	<0.47	<0.47	<1.18	<0.47	<1.18	<0.47	<1.18	<0.47	<1.18	4.55	4.55	39	4.5	80.7	<0.47	<2.4	8.82	1.61	1.14	2.94	<0.47	<0.47	4.17	<1.18	<0.47	<0.47	120	152		
0229_MW074_201028	MW074	28/10/2020	<0.48	<0.48	<0.48	<0.48	<1.2	<0.48	<1.2	<0.48	<1.2	<0.48	<1.2	5.93	5.84	41.1	2.87	47.9	<0.48	<2.4	10.2	1.96	1.48	2.68	<0.48	<0.48	1.44	<1.2	<0.48	<0.48	89	121		
0229_MW106_201028	MW106	28/10/2020	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.02	<0.05	0.05	<0.02	0.12	<0.02	0.09	<0.02	<0.1	0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.05	<0.02	<0.02	0.21	0.28			
Stockpile Designated Area 2																																		
0229_MW141_201028	MW141	28/10/2020	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.02	<0.05	0.27	0.24	1.68	0.07	0.64	<0.02	<0.1	0.49	0.09	0.03	0.07	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	2.32	3.58		
Suspected AFFF Disposal Area																																		
0229_MW101_201029	MW101	29/10/2020	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.02	<0.05	0.2	0.1	0.8	0.04	1.27	<0.02	<0.1	0.13	0.03	0.02	0.04	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	2.07	2.63		
Top, Middle and Lower Dams																																		
0229_MW138_201029	MW138	29/10/2020	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.02	<0.05	0.88	1.1	6.19	0.35	7.6	<0.02	0.2	1.46	0.29	0.2	0.29	<0.02	<0.02	0.04	<0.05	<0.02	<0.02	13.8	18.6		
Base Boundary																																		
0229_MW002_201028	MW002	28/10/2020	<0.05	<0.05	<0.05	<0																												

Table T3: Surface Water Field Parameter Results

Field ID	Location Code	DO mg/L	EC µS/cm	pH	Redox (mV)	Temp (°C)	Turbidity NTU	Water Colour	Odour	Sheen	Comments
Eastern PFAS Contamination Area											
0229_SW119_201029	SW119	8.3	328	6.87	5.3	35.7	59.22	Yellowish Brown	Organic Odour	No sheen	weather: Humid, algae and decaying organic matter
0229_SW121_201029	SW121	-	-	-	-	-	-	-	-	-	insufficient water volume for parameters
Top, Middle and Lower Dams											
0229_SW139_201029	SW139	3.39	672	6.53	13	26.6	1.42	Yellowish Brown	No odour	No sheen	weather: Humid
0229_SW140_201029	SW140	5.16	737	6.54	20.2	31.7	3.9	Olive Yellow	Organic Odour	No sheen	weather: Humid
Remaining On-Base											
0229_SW113_201028	SW113	2.44	377.5	7.14	23.9	32.1	0.92	Red	Organic Odour	No sheen	weather: Humid, brown algae present at location
Base Boundary											
0229_SW132_201029	SW132	3.28	186.9	6.63	-23.2	27	30.08	Yellowish Brown	Slight Organic Odour	No sheen	weather: Humid
0229_SW134_201029	SW134	8.47	434.2	7.59	11.6	34.7		Yellowish Brown	Organic Odour	No sheen	weather: Humid
0229_SW135_201028	SW135	2.52	629	7.29	54	30.5	7.55	Yellowish Red	Slight Organic Odour	No sheen	weather: Humid
Off-Base											
0229_SW203_201102	SW203	1.92	21227	6.55	-57.1	27.4	39.86	Black	Rotten egg smell (sulfurous)	Biosheen Appearance	weather: Humid
0229_SW205_201102	SW205	6.61	56436	7.39	44.3	29.8	49.86	Olive Yellow	No odour	No sheen	weather: Humid
0229_SW217_201102	SW217	4.34	960	6.71	24	28.3	11.5	Yellowish Brown	Organic Odour	Biosheen Appearance	weather: Humid
0229_SW220_201102	SW220	4.19	1917	7.15	1	30.9	15.69	Light Olive Brown	Septic	No sheen	weather: Humid
0229_SW227_201103	SW227	8.93	347.6	8.41	12.1	347.5	1.44	Light Olive Brown	No odour	No sheen	weather: Humid
0229_SW232_201102	SW232	7.62	262.8	7.64	28.1	29.9	8.21	Black	Putrefied	Biosheen Appearance	weather: Humid
0229_SW233_201102	SW233	2.58	1412	7.2	0.8	28.5	6	Dark Reddish Brown	No odour	No sheen	weather: Humid
0229_SW242_201102	SW242	5.82	64101	7.65	32.1	29.9	4.39	Light Olive Brown	No odour	No sheen	weather: Humid
0229_SW243_201102	SW243	6.4	63560	7.64	35.1	31.1	17.23	Light Olive Brown	No odour	No sheen	weather: Humid
0229_SW244_201103	SW244	7.57	493.9	7.93	14.2	30.2	2.28	Light Olive Brown	No odour	No sheen	weather: Humid
0229_SW245_201103	SW245	7.3	297.5	7.58	13.9	31.8	1.63	Light Olive Brown	No odour	No sheen	weather: Humid

DO - Dissolved Oxygen
 EC - Electrical Conductivity
 Redox - Redox Oxidation Potential
 Temp - Temperature
 NTU - Nephelometric Turbidity Unit
 mg/L - milligrams per litre
 µs/cm - microsiemens per centimetre
 mV - millivolt
 °C - degrees Celcius
 "-" denotes no analysis taken

Table T4: Surface Water PFAS Analytical Results

	4:2 FTS	6:2 FTS	8:2 FTS	10:2 FTS	EIFOSA	EIFOSAA	EIFOSE	FOSA	MeFOSA	MFOSAA	MeFOSE	PFBS	PFPeS	PFHxS	PFHpS	PFOS	PFDS	PFBA	PFHxA	PFPeA	PFHpA	PFDA	PFDoDA	PFNA	PFTeDA	PFTrDA	PFUnDA	Sum of PFHxS and PFOS	Sum of PFAS	
	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	
EQL	0.05	0.05	0.05	0.05	0.05	0.02	0.05	0.02	0.05	0.02	0.05	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	0.05	0.02	0.02	0.01	0.01
NHMRC (2019) PFAS Recreational Water																						10							2	
PFAS NEMP 2020 Drinking Water* (HEPA, 2020)																						0.56							0.07	
PFAS NEMP 2020 Freshwater and Marine 95% Species Protection (HEPA, 2020)																0.13						220								

Field ID	Location Code	Sample Date	4:2 FTS	6:2 FTS	8:2 FTS	10:2 FTS	EIFOSA	EIFOSAA	EIFOSE	FOSA	MeFOSA	MFOSAA	MeFOSE	PFBS	PFPeS	PFHxS	PFHpS	PFOS	PFDS	PFBA	PFHxA	PFPeA	PFHpA	PFDA	PFDoDA	PFNA	PFTeDA	PFTrDA	PFUnDA	Sum of PFHxS and PFOS	Sum of PFAS	
Remaining On-Base																																
0229_SW113_201028	SW113	28/10/2020	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.02	<0.05	0.08	0.03	0.19	<0.02	0.22	<0.02	0.2	0.2	0.06	0.02	0.03	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	0.41	1.03
Eastern PFAS Contamination Area																																
0229_SW119_201029	SW119	29/10/2020	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.02	<0.05	0.39	0.32	1.66	0.04	0.77	<0.02	<0.2	0.62	0.12	0.06	0.07	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	2.43	4.05
0229_SW121_201029	SW121	29/10/2020	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.02	<0.05	0.35	0.32	2.13	0.06	1.19	<0.02	<0.3	0.71	0.12	0.06	0.09	<0.02	<0.02	0.06	<0.05	<0.02	<0.02	3.32	5.09
Top, Middle and Lower Dams																																
0229_SW139_201029	SW139	29/10/2020	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.02	<0.05	0.14	0.14	0.84	0.04	0.99	<0.02	<0.1	0.25	0.05	0.03	0.04	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	1.83	2.52
0229_SW140_201029	SW140	29/10/2020	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.02	<0.05	0.13	0.12	0.89	0.05	1.63	<0.02	<0.1	0.25	0.05	0.02	0.06	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	2.52	3.2
Base Boundary																																
0229_SW132_201029	SW132	29/10/2020	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.02	<0.05	0.09	0.06	0.38	<0.02	0.74	<0.02	<0.1	0.09	<0.02	<0.02	0.03	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	1.12	1.39
0229_SW134_201029	SW134	29/10/2020	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.02	<0.05	<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	<0.05	<0.02	<0.02	<0.01	<0.01
0229_SW135_201028	SW135	28/10/2020	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.02	<0.05	0.05	<0.02	0.16	<0.02	0.52	<0.02	<0.1	0.03	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	0.68	0.76
Off-Base																																
0229_SW203_201102	SW203	2/11/2020	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.02	<0.05	0.05	0.02	0.19	<0.02	0.17	<0.02	<0.1	0.04	<0.02	<0.02	0.01	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	0.36	0.48
0229_SW205_201102	SW205	2/11/2020	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.02	<0.05	<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	<0.05	<0.02	<0.02	0.02	0.02
0229_SW217_201102	SW217	2/11/2020	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.02	<0.05	<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	<0.05	<0.02	<0.02	<0.01	<0.01
0229_SW220_201102	SW220	2/11/2020	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.02	<0.05	0.07	0.04	0.37	<0.02	0.45	<0.02	<0.1	0.08	<0.02	<0.02	0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	0.82	1.03
0229_SW227_201103	SW227	3/11/2020	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.02	<0.05	<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	<0.05	<0.02	<0.02	<0.01	<0.01
0229_SW232_201102	SW232	2/11/2020	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.02	<0.05	<0.02	<0.02	<0.02	<0.02	0.09	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	0.09	0.09
0229_SW233_201102	SW233	2/11/2020	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.02	<0.05	0.04	0.02	0.18	<0.02	0.24	<0.02	<0.1	0.03	<0.02	<0.02	0.01	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	0.42	0.52
0229_SW242_201102	SW242	2/11/2020	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.02	<0.05	<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	<0.05	<0.02	<0.02	0.06	0.06
0229_SW243_201102	SW243	2/11/2020	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.02	<0.05	<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	<0.05	<0.02	<0.02	0.01	0.01
0229_SW244_201103	SW244	3/11/2020	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.02	<0.05	<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	<0.05	<0.02	<0.02	<0.01	<0.01
0229_SW245_201103	SW245	3/11/2020	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.02	<0.05	<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	<0.05	<0.02	<0.02	<0.01	<0.01

LOR is limit of reporting

µg/L is micrograms per litre

< denotes concentration is less than

Heads of Environmental Protection Agencies (HEPA). (2020). *PFAS National Environmental Management Plan (NEMP)*.

National Health and Medical Research Council (NHMRC). (2019). *Guidance on PFAS in Recreational Water*. August 2019 (NHMRC 2019).

*PFAS NEMP 2020 Drinking Water is used for SW245 only. This is the only sample location upstream of Blacks Weir in the Ross River, the backup drinking water source for the city of Townsville.

Denotes first time detection above LOR

Denotes new exceedance of guideline values

Table T5: Sediment Observation Results

Location ID	Sample ID	Date	Sample Description	Odour	Sample Method
Eastern PFAS Contamination Area					
SD119	0229_SD119_201029	29/10/2020	SILT, non-plastic, black with black , with some organic matter, wet, very soft, compost - decayed organic matter.	Compost - decayed organic matter	Trowel
SD121	0229_SD121_201029	29/10/2020	SILT, non-plastic, black with red-brown mottled, wet, very softl, compost - decayed organic matter.	Compost - decayed organic matter	Trowel
Former Fire Station					
SD109	0229_SD109_201029	29/10/2020	sandy CLAY, low plasticity, dark brown, with some, dry to moist, soft. highly organic	No odour	Trowel
SD110	0229_SD110_201029	29/10/2020	CLAY, medium to high plasticity, brown-grey with grey mottled, with some gravels and organics, dry to moist, soft.	No odour	Trowel
Lavarack Golf Course & Sporting Field					
SD129	0229_SD129_201029	29/10/2020	SAND, fine to medium, well graded, sub-rounded to sub-angular, pale brown with brown speckled, dry, very loose.	No odour	Trowel
SD130	0229_SD130_201029	29/10/2020	SAND, non-plastic, dark brown with red-brown , with some gravels, clay and organic matter, moist, soft.	No odour	Trowel
Top, Middle and Lower Dams					
SD137	0229_SD137_201029	29/10/2020	sandy CLAY, medium plasticity, grey with red-orange mottled, with some sub rounded gravels and organic matter, moist, soft.	No odour	Trowel
SD139	0229_SD139_201029	29/10/2020	clayey SAND, medium to coarse, well graded, brown, highly organic - roots and leaves, saturated, loose, rotten egg (sulfurous).	Rotten egg (sulfurous)	Trowel
SD140	0229_SD140_201029	29/10/2020	clayey SILT, non-plastic, dark grey with brown , dry, compost - decayed organic matter. high organic content	Compost - decayed organic matter	Trowel
Remaining On-Base					
SD113	0229_SD113_201028	28/10/2020	SAND, brown, coarse grained, saturated, large cobbles and fine to coarse gravels	No odour	Trowel
SD120	0229_SD120_201028	28/10/2020	gravelly SAND, medium to coarse, well graded, sub-angular, brown with red , dry to moist, very loose, roots.	No odour	Trowel
Base Boundary					
SD126	0229_SD126_201029	29/10/2020	CLAY, medium plasticity, brown with pale grey mottled, moist, firm. organic components - roots	No odour	Trowel
SD128	0229_SD128_201029	29/10/2020	SAND, medium to coarse, poorly graded, sub-rounded to sub-angular, red-brown with dark brown , trace of silt, moist, very loose, weakly cemented.	No odour	Trowel
SD132	0229_SD132_201029	29/10/2020	silty, sandy CLAY, fine grained, dark grey, saturated, very soft, highly organic - leaves and roots	No odour	Trowel
SD133	0229_SD133_201029	29/10/2020	silty CLAY, low plasticity, dark grey, fine grained, dry to moist	No odour	Trowel
SD134	0229_SD134_201029	29/10/2020	sandy-gravelly CLAY, low to medium plasticity, dark grey with grey mottled, with some silt and organic matter, wet, soft to firm, compost - decayed organic matter.	Compost - decayed organic matter	Trowel
SD135	0229_SD135_201028	28/10/2020	SAND, red-orange, saturated.	No odour	Trowel
SD136	0229_SD136_201028	28/10/2020	SAND, brown, saturated. trace organic matter	No odour	Trowel
Off-Base					
SD203	0229_SD203_201102	2/11/2020	SAND, fine to medium, well graded, brown with red-brown speckled, saturated, very loose, rotten egg (sulfurous).	Rotten egg (sulfurous)	Trowel
SD205	0229_SD205_201102	2/11/2020	SILT, non plastic, grey, fine grained, saturated	No odour	Trowel
SD217	0229_SD217_201102	2/11/2020	silty CLAY, low plasticity, dark grey, saturated, firm.	No odour	Trowel
SD220	0229_SD220_201102	2/11/2020	silty CLAY, low plasticity, dark grey, saturated, soft, highly organic - roots.	No odour	Trowel
SD227	0229_SD227_201103	3/11/2020	SAND, fine, well graded, dark grey, saturate. some organics	No odour	Trowel
SD232	0229_SD232_201102	2/11/2020	silty CLAY, low plasticity, grey, saturated, soft to firm, compost - decayed organic matter. roots	Compost - decayed organic matter	Trowel
SD233	0229_SD233_201102	2/11/2020	CLAY, low to medium plasticity, pale grey, with some silt, saturated, firm. highly organic	No odour	Trowel
SD242	0229_SD242_201102	2/11/2020	silty CLAY, medium plasticity, grey, with some sub angular gravels, saturated, soft to firm. dead fish heads - likely from fishing	No odour	Trowel
SD243	0229_SD243_201102	2/11/2020	silty CLAY, medium plasticity, dark grey, saturated, soft.	No odour	Trowel
SD244	0229_SD244_201103	3/11/2020	gravelly SAND, fine to coarse, poorly graded, angular to sub-angular, orange-brown, saturated, very loose. some shell fragments and small crustaceans	No odour	Trowel
SD245	0229_SD245_201103	3/11/2020	gravelly SILT, non-plastic, dark grey, saturated, soft, sub-angular gravels.	No odour	Trowel

Appendix C

Analytical Data Validation

DATA VALIDATION REPORT

Project No.:	60612487	Validation by:	[REDACTED]	Date:	07/12/2020
Client:	Department of Defence				
Site:	Lavarack Barracks Townsville (0229)				
Matrix type:	Groundwater, surface water, sediment	Data verified by:	[REDACTED]	Date:	07/12/2020
No. of primary samples:	40 groundwater, 19 surface water, 29 sediment				
Laboratory:	ALS (Brisbane), NMI (Sydney)	Project Manager:	[REDACTED]		10/12/2020
Lab reference:	ET2004260, ET2004277, ET2004329, RN1294231				
Key Issues:	No QA/QC issues were identified in the field or laboratory datasets that could have a material implication on data interpretation and therefore decision-making on the project.				
	The data are considered appropriate for use to meet the project objectives.				
Field QA/QC					
Sampling personnel	Sampling was conducted by AECOM personnel between 26 October and 3 November 2020.				
Sampling Methodology	Samples were collected using appropriate methods as identified within the main body of the report. Hydrasleeves were installed in the well for a minimum of 24 hours prior to collection.				
Chain of Custody (COC)	COC documents completed as per AECOM procedures.				
Rinsate Blank	Rinsate blank samples were collected at a frequency of one per day of sampling (four in total). Rinsates were collected from the decontaminated interface probe (0229_QC300_201028 and 0229_QC303_201103), trowel (0229_QC301_201029) and surface water sampling cup (0229_QC302_201102). Concentrations were reported below the LOR for all analytes tested (see Table C4).				
Trip Blanks	Trip blank samples were not collected as they are not required per the SAQP (AECOM, 2020).				
Eskies to Laboratory	A total of three eskies of samples were submitted to ALS across the sampling event.				
Frequency of field QC	Field duplicates (inter-laboratory duplicates) and triplicates (inter-laboratory duplicates) were collected at a frequency of one in ten primary samples (four duplicates and triplicates for groundwater, three duplicates and triplicates for surface water and four duplicates and triplicates for sediment). The target frequency of 10% for field duplicates and triplicates was achieved for groundwater, surface water and sediment.				
Handling and preservation	Primary, duplicate and triplicate samples were received preserved and chilled at the laboratory. Sample receipt temperature was reported at 5.0 °C, 5.6 °C and 24.0 °C. The elevated sample temperature of 24.0 °C was likely to be due to direct delivery of the samples from the field to the laboratory with insufficient time for the samples to be cooled before delivery, it should be noted that all eskies contained ice upon receipt by the laboratory. Samples are selected at random from the eskies by the receiving laboratory to record the temperature. No record is made of the sample that the temperature is reported from. It is noted that the recorded average field temperature of groundwater and surface water samples were 28.4 °C and 30.7 °C, respectively. This is higher than the laboratory reported 24.0 °C and demonstrates that an attempt was made to chill the samples prior to delivery to the laboratory.				

	All samples were received at the laboratory in appropriate sample containers with no sample container / preservation non-compliances noted.
Equipment Calibration	Calibration of the water quality meter was conducted each day before sampling, with the exception of 29/10/2020 which was calibrated the night before sampling. This is a deviation from the SAQP which states the water quality meter will be calibrated each day before sampling. The calibration of the meter on the night before sampling is unlikely to affect the field readings, however for future rounds the meter will be calibrated on the day of sampling.
Laboratory QA/QC	
Tests requested/reported	Samples were analysed and reported as requested on the COC.
Holding time compliance	Samples were extracted and analysed within recommended holding times.
Laboratory Accreditation	The laboratory analysis was conducted by ALS Environmental Pty Ltd (Brisbane) a National Association of Testing Authorities (NATA) accredited laboratory. The triplicate samples were analysed at the National Measurement Institute (Sydney), also a NATA accredited laboratory.
Frequency of laboratory QC	<p>The laboratory reported sufficient frequency of quality control samples to assess whether the results have been reported to an acceptable accuracy and precision, except:</p> <ul style="list-style-type: none"> Laboratory duplicates for PFAS (4.17 to 9.52 %) were below the expected rate of 10% in ET2004329 and ET2004277 for one of the laboratory methods used (EP231X) however duplicate sampling rates for laboratory method EP231X-INJ were 33%. Matrix spikes for PFAS in water (0.0%) were below the expected rate of 5% in ET2004329 and ET2004277. Similarly to the above, matrix spikes were completed at an appropriate frequency for method EP231X-INJ. <p>Based on this consideration, the laboratory QC is considered sufficient for the purposes of this investigation.</p>
Method Blank	No method blank value outliers were reported.
Laboratory duplicate RPDs	Laboratory duplicate Relative Percentage Differences (RPD) were within control limits for all samples.
Laboratory control spike (LCS) recovery	All LCS recoveries were reported within acceptable limits.
Matrix spike recovery	<p>All matrix spike (MS) recoveries were within control limits, except:</p> <ul style="list-style-type: none"> Perfluorooctane sulfonic acid (PFOS) in 0229_QC103_201029 (ET2004277) was not determined due to background level being greater than or equal to four times the spike level. 10:2 Fluorotelomer sulfonic acid (10:2 FTS) in 0229_SD113_201028 (ET2004260) reported at 59.2% which is less than the control limit (70-130%). 10:2 FTS was not detected in any soil samples in batch ET2004260.
Surrogate spike recovery	Surrogate spike recoveries were within control limits.
QA/QC Data Evaluation	
Comparison of Field Observations and Laboratory Results	No anomalous results between field observations and analysis results were noted.
Data transcription	A random 10% check of the laboratory results identified no anomalies within the electronic data, the laboratory reports, and tables generated by AECOM.

Limits of reporting	<p>Limits of Reporting (LORs) were sufficiently low to enable assessment against adopted screening levels.</p> <p>LOR values were adjusted due to sample matrix interference or high analyte concentrations for the following samples:</p> <ul style="list-style-type: none"> • 0229_MW131_201028, 0229_MW115_201028, 0229_SW119_201029 and 0229_SW121_201029; • 0229_MW135_201028 and 0229_QC100_201028; • 0229_SD109_201029; • 0229_SD217_201102 and 0229_QC107_201102 • 0229_MW217_201103 and 0229_MW232_201103
Field duplicate RPDs	<p>RPDs for groundwater, surface water, and sediment are reported in Tables C1, C2, and C3 respectively. Field duplicate RPDs were reported within control limits.</p>
Field triplicate RPDs	<p>Field triplicate RPDs were reported within control limits for all sample sets with the exception of the following (the sample with the higher concentration is in bold):</p> <ul style="list-style-type: none"> • 0229_SD139_201029 and 0229_QC203_201029 for PFHxS (99%) PFOS (57%). <p>The elevated RPDs for duplicate sediment samples is potentially due to heterogeneity within the sampling location. The sediment type at this location was clayey sand and as such there is inherent heterogeneity in the sample due to clumps of clay surrounded by sand. These differences do not impact data quality.</p>

Lab Report Number	ET2004260	ET2004260		ET2004260	RN1294231		ET2004260	ET2004260		ET2004260
Field ID	0229_MW135_201028	0229_QC100_201028		0229_MW135_201028	0229_QC200_201028		0229_MW018_201028	0229_QC101_201028		0229_MW018_201028
Date	28/10/2020	28/10/2020		28/10/2020	28/10/2020		28/10/2020	28/10/2020		28/10/2020
Sample Type	Primary	Duplicate	RPD	Primary	Triplicate	RPD	Primary	Duplicate	RPD	Primary

Chemical Name	Unit	EQL										
4:2 FTS	µg/L	0.01	<0.05	<0.05	0	<0.05	<0.01	0	<0.10	<0.10	0	<0.10
8:2 FTS	µg/L	0.01	<0.05	<0.05	0	<0.05	0.012	0	<0.10	<0.10	0	<0.10
8:2 FTS	µg/L	0.01	<0.05	<0.05	0	<0.05	<0.01	0	<0.10	<0.10	0	<0.10
10:2 FTS	µg/L	0.01	<0.05	<0.05	0	<0.05	<0.01	0	<0.10	<0.10	0	<0.10
EtFOSA	µg/L	0.02	<0.05	<0.05	0	<0.05	<0.02	0	<0.25	<0.24	0	<0.25
EtFOSAA	µg/L	0.01	<0.02	<0.02	0	<0.02	<0.01	0	<0.10	<0.10	0	<0.10
EtFOSE	µg/L	0.05	<0.05	<0.05	0	<0.05	<0.05	0	<0.25	<0.24	0	<0.25
FOSA	µg/L	0.01	<0.02	<0.02	0	<0.02	<0.01	0	<0.10	<0.10	0	<0.10
MeFOSA	µg/L	0.02	<0.05	<0.05	0	<0.05	<0.02	0	<0.25	<0.24	0	<0.25
MeFOSAA	µg/L	0.01	<0.02	<0.02	0	<0.02	<0.01	0	<0.10	<0.10	0	<0.10
MeFOSE	µg/L	0.05	<0.05	<0.05	0	<0.05	<0.05	0	<0.25	<0.24	0	<0.25
PFBS	µg/L	0.01	0.13	0.12	8	0.13	0.1	26	2.97	2.96	0	2.97
PFPeS	µg/L	0.01	0.13	0.12	8	0.13	0.092	34	2.79	2.82	1	2.79
PFHxS	µg/L	0.01	1.73	1.6	8	1.73	1.4	21	15.3	15.9	4	15.3
PFHpS	µg/L	0.01	0.13	0.12	8	0.13	0.072	57	1.11	1.09	2	1.11
PFOS	µg/L	0.01	2.37	1.94	20	2.37	2.1	12	22.1	21.6	2	22.1
PFDS	µg/L	0.01	<0.02	<0.02	0	<0.02	<0.01	0	<0.10	<0.10	0	<0.10
PFBA	µg/L	0.05	<0.10	<0.10	0	<0.10	<0.05	0	0.8	0.8	0	0.8
PFHxA	µg/L	0.01	0.11	0.11	0	0.11	0.094	16	5.61	5.61	0	5.61
PFPeA	µg/L	0.02	<0.10	<0.10	0	<0.10	<0.02	0	1.09	1.12	3	1.09
PFHpA	µg/L	0.01	0.02	0.02	0	0.02	0.014	35	0.78	0.76	3	0.78
PFOA	µg/L	0.01	0.07	0.07	0	0.07	0.061	14	1.12	1.17	4	1.12
PFDA	µg/L	0.01	<0.02	<0.02	0	<0.02	<0.01	0	<0.10	<0.10	0	<0.10
PFDaDA	µg/L	0.01	<0.02	<0.02	0	<0.02	<0.01	0	<0.10	<0.10	0	<0.10
PFNA	µg/L	0.01	<0.02	<0.02	0	<0.02	<0.01	0	<0.10	<0.10	0	<0.10
PFTeDA	µg/L	0.02	<0.05	<0.05	0	<0.05	<0.02	0	<0.25	<0.24	0	<0.25
PFTrDA	µg/L	0.02	<0.02	<0.02	0	<0.02	<0.02	0	<0.10	<0.10	0	<0.10
PFUnDA	µg/L	0.01	<0.02	<0.02	0	<0.02	<0.01	0	<0.10	<0.10	0	<0.10
PFAS	µg/L	0.01	4.69	4.1	13	4.69	-	-	53.7	53.8	0	53.7

*RPDs have only been considered where a concentration is greater than 1 times the EQL.

**Elevated RPDs are highlighted as per QAQC Profile settings (Acceptable RPDs for each EQL multiplier range are: 81 (1 - 10 x EQL); 50 (10 - 30 x EQL); 30 (> 30 x EQL))

***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

Lab Report Number	RN1294231		ET2004277	ET2004277		ET2004277	RN1294231		ET2004329	ET2004329	
Field ID	0229_QC201_201028		0229_MW065_201029	0229_QC104_201029		0229_MW065_201029	0229_QC204_201029		0229_MW220_S_201103	0229_QC110_201103	
Date	28/10/2020		29/10/2020	29/10/2020		29/10/2020	29/10/2020		3/11/2020	3/11/2020	
Sample Type	Triplicate	RPD	Primary	Duplicate	RPD	Primary	Triplicate	RPD	Primary	Duplicate	RPD

Chemical Name	Unit	EQL											
4:2 FTS	µg/L	0.01	<0.01	0	<0.05	<0.05	0	<0.05	<0.01	0	<0.05	<0.05	0
8:2 FTS	µg/L	0.01	0.065	0	<0.05	<0.05	0	<0.05	<0.01	0	0.32	0.28	13
8:2 FTS	µg/L	0.01	<0.01	0	<0.05	<0.05	0	<0.05	<0.01	0	<0.05	<0.05	0
10:2 FTS	µg/L	0.01	<0.01	0	<0.05	<0.05	0	<0.05	<0.01	0	<0.05	<0.05	0
EtFOSA	µg/L	0.02	<0.02	0	<0.09	<0.09	0	<0.09	<0.02	0	<0.05	<0.05	0
EtFOSAA	µg/L	0.01	<0.01	0	<0.03	<0.03	0	<0.03	<0.01	0	<0.02	<0.02	0
EtFOSE	µg/L	0.05	<0.05	0	<0.09	<0.09	0	<0.09	<0.05	0	<0.05	<0.05	0
FOSA	µg/L	0.01	<0.01	0	<0.03	<0.03	0	<0.03	<0.01	0	<0.02	<0.02	0
MeFOSA	µg/L	0.02	<0.02	0	<0.09	<0.09	0	<0.09	<0.02	0	<0.05	<0.05	0
MeFOSAA	µg/L	0.01	<0.01	0	<0.03	<0.03	0	<0.03	<0.01	0	<0.02	<0.02	0
MeFOSE	µg/L	0.05	<0.05	0	<0.09	<0.09	0	<0.09	<0.05	0	<0.05	<0.05	0
PFBS	µg/L	0.01	2.5	17	0.36	0.41	13	0.36	0.35	3	0.16	0.16	0
PFPeS	µg/L	0.01	2.1	28	0.45	0.49	9	0.45	0.36	22	0.13	0.13	0
PFHxS	µg/L	0.01	14	9	7.17	7.86	9	7.17	5.6	25	0.64	0.66	3
PFHpS	µg/L	0.01	0.79	34	0.27	0.31	14	0.27	0.19	35	<0.02	<0.02	0
PFOS	µg/L	0.01	19	15	8.23	9.18	11	8.23	6.7	20	0.04	0.04	0
PFDS	µg/L	0.01	<0.01	0	<0.03	<0.03	0	<0.03	<0.01	0	<0.02	<0.02	0
PFBA	µg/L	0.05	0.69	15	<0.2	<0.2	0	<0.2	0.17	0	<0.1	<0.1	0
PFHxA	µg/L	0.01	4.3	26	1.47	1.56	6	1.47	1.2	20	0.03	0.02	40
PFPeA	µg/L	0.02	1	9	0.2	0.22	10	0.2	0.2	0	<0.02	<0.02	0
PFHpA	µg/L	0.01	0.72	8	0.09	0.1	11	0.09	0.088	2	<0.02	<0.02	0
PFOA	µg/L	0.01	1	11	0.18	0.19	5	0.18	0.15	18	<0.01	<0.01	0
PFDA	µg/L	0.01	<0.01	0	<0.03	<0.03	0	<0.03	<0.01	0	<0.02	<0.02	0
PFDoDA	µg/L	0.01	<0.01	0	<0.03	<0.03	0	<0.03	<0.01	0	<0.02	<0.02	0
PFNA	µg/L	0.01	<0.01	0	<0.03	<0.03	0	<0.03	<0.01	0	<0.02	<0.02	0
PFTeDA	µg/L	0.02	<0.02	0	<0.09	<0.09	0	<0.09	<0.02	0	<0.05	<0.05	0
PFTrDA	µg/L	0.02	<0.02	0	<0.03	<0.03	0	<0.03	<0.02	0	<0.02	<0.02	0
PFUnDA	µg/L	0.01	<0.01	0	<0.03	<0.03	0	<0.03	<0.01	0	<0.02	<0.02	0
PFAS	µg/L	0.01	-	-	18.4	20.3	10	18.4	-	-	1.32	1.29	2

*RPDs have only been considered where a concentration is greater than 1 times the EQL.

**Elevated RPDs are highlighted as per QAQC Profile settings (Acceptable RPDs for each EQL multiplier range are: 81 (1 - 10 x EQL); 50 (10 - 30 x EQL); 30 (> 30 x EQL))

***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

Lab Report Number	ET2004329	RN1294231	
Field ID	0229_MW220_S_201103	0229_QC210_201103	
Date	3/11/2020	3/11/2020	
Sample Type	Primary	Triplicate	RPD

Chemical Name	Unit	EQL			
4:2 FTS	µg/L	0.01	<0.05	<0.01	0
8:2 FTS	µg/L	0.01	0.32	0.31	3
8:2 FTS	µg/L	0.01	<0.05	<0.01	0
10:2 FTS	µg/L	0.01	<0.05	<0.01	0
EtFOSA	µg/L	0.02	<0.05	<0.02	0
EtFOSAA	µg/L	0.01	<0.02	<0.01	0
EtFOSE	µg/L	0.05	<0.05	<0.05	0
FOSA	µg/L	0.01	<0.02	<0.01	0
MeFOSA	µg/L	0.02	<0.05	<0.02	0
MeFOSAA	µg/L	0.01	<0.02	<0.01	0
MeFOSE	µg/L	0.05	<0.05	<0.05	0
PFBS	µg/L	0.01	0.16	0.17	6
PFPeS	µg/L	0.01	0.13	0.12	8
PFHxS	µg/L	0.01	0.64	0.68	6
PFHpS	µg/L	0.01	<0.02	<0.01	0
PFOS	µg/L	0.01	0.04	0.025	46
PFDS	µg/L	0.01	<0.02	<0.01	0
PFBA	µg/L	0.05	<0.1	0.099	0
PFHxA	µg/L	0.01	0.03	0.024	22
PFPeA	µg/L	0.02	<0.02	<0.02	0
PFHpA	µg/L	0.01	<0.02	<0.01	0
PFOA	µg/L	0.01	<0.01	<0.01	0
PFDA	µg/L	0.01	<0.02	<0.01	0
PFDoDA	µg/L	0.01	<0.02	<0.01	0
PFNA	µg/L	0.01	<0.02	<0.01	0
PFTeDA	µg/L	0.02	<0.05	<0.02	0
PFTrDA	µg/L	0.02	<0.02	<0.02	0
PFUnDA	µg/L	0.01	<0.02	<0.01	0
PFAS	µg/L	0.01	1.32	-	-

*RPDs have only been considered where a concentration is greater than 1 times the EQL.

**Elevated RPDs are highlighted as per QAQC Profile settings (Acceptable RPDs for each EQL multiplier range are: 81 (1 - 10 x EQL); 50 (10 - 30 x EQL); 30 (> 30 x EQL))

***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

Lab Report Number	ET2004277	ET2004277		ET2004277	RN1294231		ET2004329	ET2004329	
Field ID	0229_SW139_201029	0229_QC102_201029		0229_SW139_201029	0229_QC202_201029		0229_SW217_201102	0229_QC106_201102	
Date	29/10/2020	29/10/2020		29/10/2020	29/10/2020		2/11/2020	2/11/2020	
Sample Type	Primary	Duplicate	RPD	Primary	Triplicate	RPD	Primary	Duplicate	RPD

Chemical Name	Unit	EQL									
4:2 FTS	µg/L	0.01	<0.05	<0.05	0	<0.05	<0.01	0	<0.05	<0.05	0
6:2 FTS	µg/L	0.01	<0.05	<0.05	0	<0.05	<0.01	0	<0.05	<0.05	0
8:2 FTS	µg/L	0.01	<0.05	<0.05	0	<0.05	<0.01	0	<0.05	<0.05	0
10:2 FTS	µg/L	0.01	<0.05	<0.05	0	<0.05	<0.01	0	<0.05	<0.05	0
EtFOSA	µg/L	0.02	<0.05	<0.05	0	<0.05	<0.02	0	<0.05	<0.05	0
EtFOSAA	µg/L	0.01	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0
EtFOSE	µg/L	0.05	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0
FOSA	µg/L	0.01	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0
MeFOSA	µg/L	0.02	<0.05	<0.05	0	<0.05	<0.02	0	<0.05	<0.05	0
MeFOSAA	µg/L	0.01	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0
MeFOSE	µg/L	0.05	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0
PFBS	µg/L	0.01	0.14	0.14	0	0.14	0.12	15	<0.02	<0.02	0
PFPeS	µg/L	0.01	0.14	0.14	0	0.14	0.089	45	<0.02	<0.02	0
PFHxS	µg/L	0.01	0.84	0.84	0	0.84	0.77	9	<0.02	<0.02	0
PFHpS	µg/L	0.01	0.04	0.04	0	0.04	0.025	46	<0.02	<0.02	0
PFOS	µg/L	0.01	0.99	0.98	1	0.99	1.1	11	<0.01	0.01	0
PFDS	µg/L	0.01	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0
PFBA	µg/L	0.05	<0.1	<0.1	0	<0.1	0.062	0	<0.1	<0.1	0
PFHxA	µg/L	0.01	0.25	0.24	4	0.25	0.19	27	<0.02	<0.02	0
PFPeA	µg/L	0.02	0.05	0.06	18	0.05	0.043	15	<0.02	<0.02	0
PFHpA	µg/L	0.01	0.03	0.03	0	0.03	0.02	40	<0.02	<0.02	0
PFOA	µg/L	0.01	0.04	0.04	0	0.04	0.038	5	<0.01	<0.01	0
PFDA	µg/L	0.01	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0
PFDoDA	µg/L	0.01	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0
PFNA	µg/L	0.01	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0
PFTeDA	µg/L	0.02	<0.05	<0.05	0	<0.05	<0.02	0	<0.05	<0.05	0
PFTrDA	µg/L	0.02	<0.02	<0.02	0	<0.02	<0.02	0	<0.02	<0.02	0
PFUnDA	µg/L	0.01	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0
PFAS	µg/L	0.01	2.52	2.51	0	2.52	-	-	<0.01	0.01	0

*RPDs have only been considered where a concentration is greater than 1 times the EQL.

**Elevated RPDs are highlighted as per QAQC Profile settings (Acceptable RPDs for each EQL multiplier range are: 81 (1 - 10 x EQL); 50 (10 - 30 x EQL); 30 (> 30 x EQL))

***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

Lab Report Number	ET2004329	RN1294231		ET2004329	ET2004329		ET2004329	RN1294231	
Field ID	0229_SW217_201102	0229_QC206_201102		0229_SW244_201103	0229_QC108_201103		0229_SW244_201103	0229_QC208_201103	
Date	2/11/2020	2/11/2020		3/11/2020	3/11/2020		3/11/2020	3/11/2020	
Sample Type	Primary	Triplicate	RPD	Primary	Duplicate	RPD	Primary	Triplicate	RPD

Chemical Name	Unit	EQL									
4:2 FTS	µg/L	0.01	<0.05	<0.01	0	<0.05	<0.05	0	<0.05	<0.01	0
6:2 FTS	µg/L	0.01	<0.05	<0.01	0	<0.05	<0.05	0	<0.05	<0.01	0
8:2 FTS	µg/L	0.01	<0.05	<0.01	0	<0.05	<0.05	0	<0.05	<0.01	0
10:2 FTS	µg/L	0.01	<0.05	<0.01	0	<0.05	<0.05	0	<0.05	<0.01	0
EtFOSA	µg/L	0.02	<0.05	<0.02	0	<0.05	<0.05	0	<0.05	<0.02	0
EtFOSAA	µg/L	0.01	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0
EtFOSE	µg/L	0.05	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0
FOSA	µg/L	0.01	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0
MeFOSA	µg/L	0.02	<0.05	<0.02	0	<0.05	<0.05	0	<0.05	<0.02	0
MeFOSAA	µg/L	0.01	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0
MeFOSE	µg/L	0.05	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0
PFBS	µg/L	0.01	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0
PFPeS	µg/L	0.01	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0
PFHxS	µg/L	0.01	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0
PFHpS	µg/L	0.01	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0
PFOS	µg/L	0.01	<0.01	<0.02	0	<0.01	<0.01	0	<0.01	<0.02	0
PFDS	µg/L	0.01	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0
PFBA	µg/L	0.05	<0.1	<0.05	0	<0.1	<0.1	0	<0.1	<0.05	0
PFHxA	µg/L	0.01	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0
PFPeA	µg/L	0.02	<0.02	<0.02	0	<0.02	<0.02	0	<0.02	<0.02	0
PFHpA	µg/L	0.01	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0
PFOA	µg/L	0.01	<0.01	<0.01	0	<0.01	<0.01	0	<0.01	<0.01	0
PFDA	µg/L	0.01	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0
PFDoDA	µg/L	0.01	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0
PFNA	µg/L	0.01	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0
PFTeDA	µg/L	0.02	<0.05	<0.02	0	<0.05	<0.05	0	<0.05	<0.02	0
PFTrDA	µg/L	0.02	<0.02	<0.02	0	<0.02	<0.02	0	<0.02	<0.02	0
PFUnDA	µg/L	0.01	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0
PFAS	µg/L	0.01	<0.01	-	-	<0.01	<0.01	0	<0.01	-	-

*RPDs have only been considered where a concentration is greater than 1 times the EQL.

**Elevated RPDs are highlighted as per QAQC Profile settings (Acceptable RPDs for each EQL multiplier range are: 81 (1 - 10 x EQL); 50 (10 - 30 x EQL); 30 (> 30 x EQL))

***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

Lab Report Number	ET2004277	ET2004277		ET2004277	RN1294231		ET2004277	ET2004277		ET2004277	RN1294231	
Field ID	0229_SD139_201029	0229_OC103_201029		0229_SD139_201029	0229_OC203_201029		0229_SD137_201029	0229_OC105_201029		0229_SD137_201029	0229_OC205_201029	
Date	29/10/2020	29/10/2020		29/10/2020	29/10/2020		29/10/2020	29/10/2020		29/10/2020	29/10/2020	
Sample type	Primary	Duplicate	RPD	Primary	Duplicate	RPD	Primary	Duplicate	RPD	Primary	Triplicate	RPD

Chemical Name	Unit	EQL												
4:2 FTS	mg/kg	0.0005	<0.0010	<0.0005	0	<0.0010	<0.001	0	<0.0005	<0.0005	0	<0.0005	<0.001	0
6:2 FTS	mg/kg	0.0005	<0.0010	<0.0005	0	<0.0010	<0.001	0	<0.0005	<0.0005	0	<0.0005	<0.001	0
8:2 FTS	mg/kg	0.0005	<0.0010	<0.0005	0	<0.0010	<0.001	0	<0.0005	<0.0005	0	<0.0005	<0.001	0
10:2 FTS	mg/kg	0.0005	<0.0010	<0.0005	0	<0.0010	<0.002	0	<0.0005	<0.0005	0	<0.0005	<0.002	0
EtFOSA	mg/kg	0.0005	<0.0025	<0.0012	0	<0.0025	<0.002	0	<0.0005	<0.0005	0	<0.0005	<0.002	0
EtFOSA	mg/kg	0.0002	<0.0010	<0.0005	0	<0.0010	<0.002	0	<0.0002	<0.0002	0	<0.0002	<0.002	0
EtFOSE	mg/kg	0.0005	<0.0025	<0.0012	0	<0.0025	<0.005	0	<0.0005	<0.0005	0	<0.0005	<0.005	0
FOSA	mg/kg	0.0002	<0.0010	<0.0005	0	<0.0010	<0.001	0	<0.0002	<0.0002	0	<0.0002	<0.001	0
MeFOSA	mg/kg	0.0005	<0.0025	<0.0012	0	<0.0025	<0.002	0	<0.0005	<0.0005	0	<0.0005	<0.002	0
MeFOSA	mg/kg	0.0002	<0.0010	<0.0005	0	<0.0010	<0.002	0	<0.0002	<0.0002	0	<0.0002	<0.002	0
MeFOSE	mg/kg	0.0005	<0.0025	<0.0012	0	<0.0025	<0.005	0	<0.0005	<0.0005	0	<0.0005	<0.005	0
PFBS	mg/kg	0.0002	<0.0010	<0.0005	0	<0.0010	<0.001	0	<0.0002	<0.0002	0	<0.0002	<0.001	0
PFPeS	mg/kg	0.0002	<0.0010	<0.0005	0	<0.0010	<0.001	0	<0.0002	<0.0002	0	<0.0002	<0.001	0
PFHxS	mg/kg	0.0002	0.0024	0.0023	4	0.0024	0.0071	99	<0.0002	<0.0002	0	<0.0002	<0.001	0
PFFpS	mg/kg	0.0002	<0.0010	<0.0005	0	<0.0010	<0.001	0	<0.0002	<0.0002	0	<0.0002	<0.001	0
PFOS	mg/kg	0.0002	0.0227	0.0181	23	0.0227	0.041	57	0.0003	0.0003	0	0.0003	<0.002	0
PFDS	mg/kg	0.0002	<0.0010	<0.0005	0	<0.0010	<0.001	0	<0.0002	<0.0002	0	<0.0002	<0.001	0
PFBA	mg/kg	0.001	<0.005	<0.002	0	<0.005	<0.002	0	<0.001	<0.001	0	<0.001	<0.002	0
PFFxA	mg/kg	0.0002	<0.0010	<0.0005	0	<0.0010	<0.001	0	<0.0002	<0.0002	0	<0.0002	<0.001	0
PFFxA	mg/kg	0.0002	<0.0010	<0.0005	0	<0.0010	<0.002	0	<0.0002	<0.0002	0	<0.0002	<0.002	0
PFFpA	mg/kg	0.0002	<0.0010	<0.0005	0	<0.0010	<0.001	0	<0.0002	<0.0002	0	<0.0002	<0.001	0
PFOA	mg/kg	0.0002	<0.0010	<0.0005	0	<0.0010	<0.001	0	<0.0002	<0.0002	0	<0.0002	<0.001	0
PFDA	mg/kg	0.0002	<0.0010	<0.0005	0	<0.0010	<0.001	0	<0.0002	<0.0002	0	<0.0002	<0.001	0
PFDoDA	mg/kg	0.0002	<0.0010	<0.0005	0	<0.0010	<0.002	0	<0.0002	<0.0002	0	<0.0002	<0.002	0
PFNA	mg/kg	0.0002	<0.0010	<0.0005	0	<0.0010	<0.001	0	<0.0002	<0.0002	0	<0.0002	<0.001	0
PFFTeDA	mg/kg	0.0005	<0.0025	<0.0012	0	<0.0025	<0.002	0	<0.0005	<0.0005	0	<0.0005	<0.002	0
PFFTrDA	mg/kg	0.0002	<0.0010	<0.0005	0	<0.0010	<0.002	0	<0.0002	<0.0002	0	<0.0002	<0.002	0
PFUnDA	mg/kg	0.0002	<0.0010	<0.0005	0	<0.0010	<0.002	0	<0.0002	<0.0002	0	<0.0002	<0.002	0
PFAS	mg/kg	0.0002	0.0251	0.0204	21	0.0251	-	-	0.0003	0.0003	0	0.0003	-	-

*RPDs have only been considered where a concentration is greater than 1 times the EQL.

**Elevated RPDs are highlighted as per QAQC Profile settings (Acceptable RPDs for each EQL multiplier range are: 81 (1 - 10 x EQL); 50 (10 - 30 x EQL); 30 (> 30 x EQL))

***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

Lab Report Number	ET2004329	ET2004329		ET2004329	RN1294231		ET2004329	ET2004329		ET2004329	RN1294231	
Field ID	0229_SD217_2011102	0229_QC107_2011102		0229_SD217_2011102	0229_QC207_2011102		0229_SD244_2011103	0229_QC109_2011103		0229_SD244_2011103	0229_QC209_2011103	
Date	2/11/2020	2/11/2020		2/11/2020	2/11/2020		3/11/2020	3/11/2020		3/11/2020	3/11/2020	
Sample type	Primary	Duplicate	RPD	Primary	Triplicate	RPD	Primary	Duplicate	RPD	Primary	Triplicate	RPD

Chemical Name	Unit	EQL												
4:2 FTS	mg/kg	0.0005	<0.0005	<0.0005	0	<0.0005	<0.001	0	<0.0005	<0.0005	0	<0.0005	<0.001	0
6:2 FTS	mg/kg	0.0005	<0.0005	<0.0005	0	<0.0005	<0.001	0	<0.0005	<0.0005	0	<0.0005	<0.001	0
8:2 FTS	mg/kg	0.0005	<0.0005	<0.0005	0	<0.0005	<0.001	0	<0.0005	<0.0005	0	<0.0005	<0.001	0
10:2 FTS	mg/kg	0.0005	<0.0005	<0.0005	0	<0.0005	<0.002	0	<0.0005	<0.0005	0	<0.0005	<0.002	0
EtFOSA	mg/kg	0.0005	<0.0012	<0.0012	0	<0.0012	<0.002	0	<0.0005	<0.0005	0	<0.0005	<0.002	0
EtFOSAA	mg/kg	0.0002	<0.0005	<0.0005	0	<0.0005	<0.002	0	<0.0002	<0.0002	0	<0.0002	<0.002	0
EtFOSE	mg/kg	0.0005	<0.0012	<0.0012	0	<0.0012	<0.005	0	<0.0005	<0.0005	0	<0.0005	<0.005	0
FOSA	mg/kg	0.0002	<0.0005	<0.0005	0	<0.0005	<0.001	0	<0.0002	<0.0002	0	<0.0002	<0.001	0
MeFOSA	mg/kg	0.0005	<0.0012	<0.0012	0	<0.0012	<0.002	0	<0.0005	<0.0005	0	<0.0005	<0.002	0
MeFOSAA	mg/kg	0.0002	<0.0005	<0.0005	0	<0.0005	<0.002	0	<0.0002	<0.0002	0	<0.0002	<0.002	0
MeFOSE	mg/kg	0.0005	<0.0012	<0.0012	0	<0.0012	<0.005	0	<0.0005	<0.0005	0	<0.0005	<0.005	0
PFBS	mg/kg	0.0002	<0.0005	<0.0005	0	<0.0005	<0.001	0	<0.0002	<0.0002	0	<0.0002	<0.001	0
PFPeS	mg/kg	0.0002	<0.0005	<0.0005	0	<0.0005	<0.001	0	<0.0002	<0.0002	0	<0.0002	<0.001	0
PFHxS	mg/kg	0.0002	<0.0005	<0.0005	0	<0.0005	<0.001	0	<0.0002	<0.0002	0	<0.0002	<0.001	0
PFHpS	mg/kg	0.0002	<0.0005	<0.0005	0	<0.0005	<0.001	0	<0.0002	<0.0002	0	<0.0002	<0.001	0
PFOS	mg/kg	0.0002	0.0010	<0.0008	22	0.0010	<0.002	0	<0.0002	<0.0002	0	<0.0002	<0.002	0
PFDS	mg/kg	0.0002	<0.0005	<0.0005	0	<0.0005	<0.001	0	<0.0002	<0.0002	0	<0.0002	<0.001	0
PFBA	mg/kg	0.001	<0.002	<0.002	0	<0.002	<0.002	0	<0.001	<0.001	0	<0.001	<0.002	0
PFHxA	mg/kg	0.0002	<0.0005	<0.0005	0	<0.0005	<0.001	0	<0.0002	<0.0002	0	<0.0002	<0.001	0
PFPeA	mg/kg	0.0002	<0.0005	<0.0005	0	<0.0005	<0.002	0	<0.0002	<0.0002	0	<0.0002	<0.002	0
PFHpA	mg/kg	0.0002	<0.0005	<0.0005	0	<0.0005	<0.001	0	<0.0002	<0.0002	0	<0.0002	<0.001	0
PFOA	mg/kg	0.0002	<0.0005	<0.0005	0	<0.0005	<0.001	0	<0.0002	<0.0002	0	<0.0002	<0.001	0
PFDA	mg/kg	0.0002	<0.0005	<0.0005	0	<0.0005	<0.001	0	<0.0002	<0.0002	0	<0.0002	<0.001	0
PFDoDA	mg/kg	0.0002	<0.0005	<0.0005	0	<0.0005	<0.002	0	<0.0002	<0.0002	0	<0.0002	<0.002	0
PFNA	mg/kg	0.0002	<0.0005	<0.0005	0	<0.0005	<0.001	0	<0.0002	<0.0002	0	<0.0002	<0.001	0
PFTeDA	mg/kg	0.0005	<0.0012	<0.0012	0	<0.0012	<0.002	0	<0.0005	<0.0005	0	<0.0005	<0.002	0
PFTrDA	mg/kg	0.0002	<0.0005	<0.0005	0	<0.0005	<0.002	0	<0.0002	<0.0002	0	<0.0002	<0.002	0
PFUnDA	mg/kg	0.0002	<0.0005	<0.0005	0	<0.0005	<0.002	0	<0.0002	<0.0002	0	<0.0002	<0.002	0
PFAS	mg/kg	0.0002	0.0010	<0.0005	67	0.0010	-	-	<0.0002	<0.0002	0	<0.0002	-	-

*RPDs have only been considered where a concentration is greater than 1 times the EQL.

**Elevated RPDs are highlighted as per QAQC Profile settings (Acceptable RPDs for each EQL multiplier range are: 81 (1 - 10 x EQL); 50 (10 - 30 x EQL); 30 (> 30 x EQL))

***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

Lab Report Number	ET2004260	ET2004277	ET2004329	ET2004329
Field ID	0229_QC300_201028	0229_QC301_201029	0229_QC302_201102	0229_QC303_201103
Date	28/10/2020	29/10/2020	2/11/2020	3/11/2020
Matrix Type	Water	Water	Water	Water

Chemical Name	Unit	EQL				
4:2 FTS	µg/L	0.01	<0.05	<0.05	<0.05	<0.05
6:2 FTS	µg/L	0.01	<0.05	<0.05	<0.05	<0.05
8:2 FTS	µg/L	0.01	<0.05	<0.05	<0.05	<0.05
10:2 FTS	µg/L	0.01	<0.05	<0.05	<0.05	<0.05
EtFOSA	µg/L	0.02	<0.05	<0.05	<0.05	<0.05
EtFOSAA	µg/L	0.01	<0.02	<0.02	<0.02	<0.02
EtFOSE	µg/L	0.05	<0.05	<0.05	<0.05	<0.05
FOSA	µg/L	0.01	<0.02	<0.02	<0.02	<0.02
MeFOSA	µg/L	0.02	<0.05	<0.05	<0.05	<0.05
MeFOSAA	µg/L	0.01	<0.02	<0.02	<0.02	<0.02
MeFOSE	µg/L	0.05	<0.05	<0.05	<0.05	<0.05
PFBS	µg/L	0.01	<0.02	<0.02	<0.02	<0.02
PFPeS	µg/L	0.01	<0.02	<0.02	<0.02	<0.02
PFHxS	µg/L	0.01	<0.02	<0.02	<0.02	<0.02
PFHpS	µg/L	0.01	<0.02	<0.02	<0.02	<0.02
PFOS	µg/L	0.01	<0.01	<0.01	<0.01	<0.01
PFDS	µg/L	0.01	<0.02	<0.02	<0.02	<0.02
PFBA	µg/L	0.05	<0.1	<0.1	<0.1	<0.1
PFHxA	µg/L	0.01	<0.02	<0.02	<0.02	<0.02
PFPeA	µg/L	0.02	<0.02	<0.02	<0.02	<0.02
PFHpA	µg/L	0.01	<0.02	<0.02	<0.02	<0.02
PFOA	µg/L	0.01	<0.01	<0.01	<0.01	<0.01
PFDA	µg/L	0.01	<0.02	<0.02	<0.02	<0.02
PFDoDA	µg/L	0.01	<0.02	<0.02	<0.02	<0.02
PFNA	µg/L	0.01	<0.02	<0.02	<0.02	<0.02
PFTeDA	µg/L	0.02	<0.05	<0.05	<0.05	<0.05
PFTTrDA	µg/L	0.02	<0.02	<0.02	<0.02	<0.02
PFUnDA	µg/L	0.01	<0.02	<0.02	<0.02	<0.02
PFAS	µg/L	0.01	<0.01	<0.01	<0.01	<0.01

Appendix D

Chain of Custody Forms

AEC006/201109 A0

Rec 16/11/2020

CHAIN OF CUSTODY DOCUMENTATION

CLIENT: AECOM Australia	SAMPLER: [REDACTED]
ADDRESS / OFFICE: [REDACTED]	MOBILE: [REDACTED]
PROJECT MANAGER (PM): [REDACTED]	PHONE: [REDACTED]
PROJECT ID: QLD 0229 PFASOMP 20	EMAIL REPORT TO: [REDACTED]
SITE: QLD 0229 P.O. NO: 60612487_3.1	EMAIL INVOICE TO: (if different to report) [REDACTED]

NMI

RESULTS REQUIRED (Date): Standard TAT QUOTE NO: ANALYSIS REQUIRED including SUITES (note - suite codes must be listed to attract suite prices)

FOR LABORATORY USE ONLY		<u>COMMENTS / SPECIAL HANDLING / STORAGE OR DISPOSAL</u>	
COOLER SEAL (circle appropriate)			
Intact: Yes No N/A			
SAMPLE TEMPERATURE			
CHILLED: Yes No			

Notes: e.g. Highly contaminated samples e.g. "High PAHs expected".
Extra volume for QC or trace LORs etc.

SAMPLE INFORMATION (note: S = Soil, W=Water)					CONTAINER INFORMATION		WATER - PFAS Standard 28 analyses	SOIL - PFAS Standard 28 # analyses	HOLD
ALS ID	SAMPLE ID	MATRIX	DATE	Time	Type / Code	Total bottles			
	0229_QC200_201028	W	28/10/20		2 x P	2	X		
	0229_QC201_201028	W	28/10/20		2 x P	2	X		
	0229_QC202_201029	W	29/10/20		2 x P	2	X		
	0229_QC203_201029	S	29/10/20		1 x P	1		X	
	0229_QC204_201029	W	29/10/20		2 x P	2	X		
	0229_QC205_201029	S	29/10/20		1 x P	1		X	
	0229_QC206_201102	W	2/11/20		2 x P	2	X		
	0229_QC207_201102	S	2/11/20		1 x P	1		X	
	0229_QC208_201103	W	3/11/20		2 x P	2	X		
	0229_QC209_201103	S	3/11/20		1 x P	1		X	
	0229_QC210_201103	W	3/11/20		2 x P	2	X		

N20/026326
N20/026327
N20/026328
N20/026329
N20/026330
N20/026331
N20/026332
N20/026333
N20/026334
N20/026335

RECEIVED
09 NOV 2020
BY: [REDACTED]

RELINQUISHED BY:		RECEIVED BY:		METHOD OF SHIPMENT:
Name:	Time: 11:30	Name:	Date:	Con' Note No:
Date: 06/11/2020		Of:	Time:	
Of:	Time:	Date:	Time:	Transport Co:

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



ALS Compass
SAMPLING *Intelligence*



Environmental Division
Townsville
Work Order Reference
ET2004260



Telephone : +61 7 4773 0000

Custody Document for Submissions via ALS Compass App

Project: BLD_0229_PFA5 BMP - 20 Client: _____

Project Manager: _____

Phone: (_____)

ALS Compass COC Reference: 15322 # Samples: _____

Sampler: _____

Phone: (_____)

Turnaround Requirements: Standard _____ Urgent _____

Special Instructions:

ALS Use Only

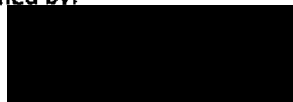
Custody seal intact? YES NO N/A

Free ice / frozen ice bricks upon receipt? YES NO N/A

Random sample temperature on receipt? 5.6 °C

Custody:

Relinquished by:



Received by:



Relinquished by:

Received by:

Date / Time:


28/10/2020 17:15

Date / Time:

28/10/20 17.15.

Date / Time:

Date / Time:

 CHAIN OF CUSTODY COC#: 15322 ALS Laboratory: ET Townsville		RELINQUISHED BY: DATE TIME:	RECEIVED BY: DATE TIME:	RELINQUISHED BY: DATE TIME:	RECEIVED BY: DATE TIME:	
CLIENT: AECOMAU - AECOM Australia Pty Ltd PROJECT: QLD_0229_PFASOMP_20 SITE: QLD_0229 ORDER NO: 60612487_2.2 PROJECT MANAGER: [REDACTED] PRIMARY SAMPLER: [REDACTED] 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:			
		CONTACT PH: QUOTE NO: TV/123/20	SAMPLER MOBILE: / ET2020AECOMAU000 1			

SAMPLE DETAILS							ANALYSIS REQUIRED			
SAMPLE	NAME	DESCRIPTION	DATE / TIME	MATRIX	TOTAL BOTTLES	ON HOLD	PFAS Sediments SEDIMENT	PFAS Waters WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
001	0229_SD136_201028		28/10/2020 08:25 AM	Soil	ALS: 1 Non ALS: 0	No	X			
002	0229_MW119_201028		28/10/2020 09:17 AM	Water	ALS: 2 Non ALS: 0	No		X		
003	0229_MW118_201028		28/10/2020 09:43 AM	Water	ALS: 2 Non ALS: 0	No		X		
004	0229_MW117_D_201028		28/10/2020 10:16 AM	Water	ALS: 2 Non ALS: 0	No		X		
005	0229_MW117_S_201028	Extra vol for lab QC	28/10/2020 10:16 AM	Water	ALS: 4 Non ALS: 0	No		X		Extra vol for lab QC
006	0229_MW141_201028		28/10/2020 10:57 AM	Water	ALS: 2 Non ALS: 0	No		X		
007	0229_SW113_201028		28/10/2020 11:28 AM	Water	ALS: 2 Non ALS: 0	No		X		
008	0229_SD113_201028		28/10/2020 11:29 AM	Soil	ALS: 1 Non ALS: 0	No	X			
009	0229_MW106_201028		28/10/2020 11:20 AM	Water	ALS: 2 Non ALS: 0	No		X		

**CHAIN OF CUSTODY**

COC#: 15322

ALS Laboratory: ET Townsville

RELINQUISHED BY:

RECEIVED BY:

RELINQUISHED BY:

RECEIVED BY:

DATE TIME:

DATE TIME:

DATE TIME:

DATE TIME:

CLIENT: AECOMAU - AECOM Australia Pty Ltd

PROJECT: QLD_0229_PFASOMP_20

SITE: QLD_0229

ORDER NO: 60612487_2.2

PROJECT MANAGER:

PRIMARY SAMPLER:

EMAIL REPORTS TO:

EMAIL INVOICES TO:

CONTACT PH:

QUOTE NO: TV/123/20

SAMPLER MOBILE:

/ ET2020AECOMAU000
1

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact?

Yes No N/A

Free ice / frozen ice bricks present upon receipt?

Yes No N/A

Random Sample Temperature on Receipt:

°C

Other comments:

SAMPLE DETAILS**ANALYSIS REQUIRED**

SAMPLE	NAME	DESCRIPTION	DATE / TIME	MATRIX	TOTAL BOTTLES	ON HOLD	ANALYSIS REQUIRED			
							PFAS Sediments SEDIMENT	PFAS Waters WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
010	0229_MW074_201028		28/10/2020 11:57 AM	Water	ALS: 2 Non ALS: 0	No		X		
011	0229_MW131_201028		28/10/2020 12:41 PM	Water	ALS: 2 Non ALS: 0	No		X		
012	0229_MW072_201028		28/10/2020 12:42 PM	Water	ALS: 4 Non ALS: 0	No		X		Extra vol for lab QC
013	0229_MW135_201028		28/10/2020 01:37 PM	Water	ALS: 2 Non ALS: 0	No		X		
014	0229_QC100_201028		28/10/2020 01:38 PM	Water	ALS: 2 Non ALS: 0	No		X		
015	0229_MW116_201028		28/10/2020 02:14 PM	Water	ALS: 2 Non ALS: 0	No		X		
016	0229_MW115_201028		28/10/2020 02:50 PM	Water	ALS: 2 Non ALS: 0	No		X		
017	0229_MW002_201028		28/10/2020 02:58 PM	Water	ALS: 2 Non ALS: 0	No		X		
018	0229_SD135_201028		28/10/2020 03:00 PM	Soil	ALS: 1 Non ALS: 0	No	X			

RELINQUISHED BY:
 DATE TIME:

RECEIVED BY:
 DATE TIME:

RELINQUISHED BY:
 DATE TIME:

RECEIVED BY:
 DATE TIME:

CLIENT: AECOMAU - AECOM Australia Pty Ltd
 PROJECT: QLD_0229_PFSOMP_20
 SITE: QLD_0229
 ORDER NO: 60612487_2.2

TURNAROUND REQUIREMENTS : 5 Days
 Biohazard info:

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

PROJECT MANAGER:
 PRIMARY SAMPLER:
 EMAIL REPORTS TO:
 EMAIL INVOICES TO:

CONTACT PH:
 QUOTE NO: TV/123/20
 SAMPLER MOBILE:
 / ET2020AECOMAU000
 1

Other comments:

SAMPLE DETAILS							ANALYSIS REQUIRED			
SAMPLE	NAME	DESCRIPTION	DATE / TIME	MATRIX	TOTAL BOTTLES	ON HOLD	PFAS Sediments SEDIMENT	PFAS Waters WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
019	0229_SW135_201028		28/10/2020 03:02 PM	Water	ALS: 2 Non ALS: 0	No		X		
020	0229_SD120_201028		28/10/2020 03:20 PM	Water	ALS: 1 Non ALS: 0	No	X			
021	0229_MW018_201028		28/10/2020 03:48 PM	Water	ALS: 2 Non ALS: 0	No		X		
022	0229_QC102_201028		28/10/2020 03:49 PM	Water	ALS: 2 Non ALS: 0	No		X		
023	0229_MW114_201028		28/10/2020 04:05 PM	Water	ALS: 4 Non ALS: 0	No		X		
024	0229_QC300_201028		28/10/2020 04:07 PM	Water	ALS: 2 Non ALS: 0	No		X		
025	0229_MW123_I_201028		28/10/2020 04:49 PM	Water	ALS: 2 Non ALS: 0	No		X		
026	0229_MW139_201028		28/10/2020 04:23 PM	Water	ALS: 2 Non ALS: 0	No		X		

RELINQUISHED BY:

RECEIVED BY:

RELINQUISHED BY:

RECEIVED BY:

DATE TIME:

DATE TIME:

DATE TIME:

DATE TIME:

CLIENT: AECOMAU - AECOM Australia Pty Ltd

PROJECT: QLD_0229_PFASOMP_20

SITE: QLD_0229

ORDER NO: 60612487_2.2

PROJECT MANAGER:

PRIMARY SAMPLER:

EMAIL REPORTS TO:

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:

CONTACT PH:

QUOTE NO: TV123/20

SAMPLER MOBILE:

/ ET2020AECOMAU000
1

SAMPLE	SAMPLE NAME	BOTTLE NAME	VOLUME	BARCODE	TYPE	FILTERED	REASON
001	0229_SD136_201028	HDPE Soil Jar	200 mL	00620219019701	Grey	No	
002	0229_MW119_201028	HDPE (no PTFE)	20 mL	00352005017749	Grey	No	
002	0229_MW119_201028	HDPE (no PTFE)	20 mL	00352005004850	Grey	No	
003	0229_MW118_201028	HDPE (no PTFE)	20 mL	00352005004916	Grey	No	
003	0229_MW118_201028	HDPE (no PTFE)	20 mL	00352005017721	Grey	No	
004	0229_MW117_D_201028	HDPE (no PTFE)	20 mL	00352005017708	Grey	No	
004	0229_MW117_D_201028	HDPE (no PTFE)	20 mL	00352005004973	Grey	No	
005	0229_MW117_S_201028	HDPE (no PTFE)	20 mL	00352005017671	Grey	No	
005	0229_MW117_S_201028	HDPE (no PTFE)	20 mL	00352005005014	Grey	No	
005	0229_MW117_S_201028	HDPE (no PTFE)	20 mL	00352005004857	Grey	No	
005	0229_MW117_S_201028	HDPE (no PTFE)	20 mL	00352005017740	Grey	No	
006	0229_MW141_201028	HDPE (no PTFE)	20 mL	00352005005003	Grey	No	
006	0229_MW141_201028	HDPE (no PTFE)	20 mL	00352005004865	Grey	No	
007	0229_SW113_201028	HDPE (no PTFE)	20 mL	00352005004986	Grey	No	
007	0229_SW113_201028	HDPE (no PTFE)	20 mL	00352005004848	Grey	No	
008	0229_SD113_201028	HDPE Soil Jar	200 mL	00620719018167	Grey	No	
009	0229_MW106_201028	HDPE (no PTFE)	20 mL	00352005004852	Grey	No	
009	0229_MW106_201028	HDPE (no PTFE)	20 mL	00352005017682	Grey	No	
010	0229_MW074_201028	HDPE (no PTFE)	20 mL	00352005004922	Grey	No	
010	0229_MW074_201028	HDPE (no PTFE)	20 mL	00352005004919	Grey	No	
011	0229_MW131_201028	HDPE (no PTFE)	20 mL	00352005003561	Grey	No	
011	0229_MW131_201028	HDPE (no PTFE)	20 mL	00352005003444	Grey	No	
012	0229_MW072_201028	HDPE (no PTFE)	20 mL	00352005004844	Grey	No	
012	0229_MW072_201028	HDPE (no PTFE)	20 mL	00352005017722	Grey	No	
012	0229_MW072_201028	HDPE (no PTFE)	20 mL	00352005017747	Grey	No	
012	0229_MW072_201028	HDPE (no PTFE)	20 mL	00352005005035	Grey	No	

RELINQUISHED BY:

RECEIVED BY:

RELINQUISHED BY:

RECEIVED BY:

DATE TIME:

DATE TIME:

DATE TIME:

DATE TIME:

CLIENT: AECOMAU - AECOM Australia Pty Ltd

PROJECT: QLD_0229_PFASOMP_20

SITE: QLD_0229

ORDER NO: 60612487_2.2

PROJECT MANAGER:

PRIMARY SAMPLER:

EMAIL REPORTS TO:

EMAIL INVOICES TO:

CONTACT PH:

QUOTE NO: TV/123/20

SAMPLER MOBILE:

/ ET2020AECOMAU000
1

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

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

Random Sample Temperature on Receipt: °C

Other comments:

013	0229_MW135_201028	HDPE (no PTFE)	20 mL	00352005017694	Grey	No	
013	0229_MW135_201028	HDPE (no PTFE)	20 mL	00352005004884	Grey	No	
014	0229_QC100_201028	HDPE (no PTFE)	20 mL	00352005017666	Grey	No	
014	0229_QC100_201028	HDPE (no PTFE)	20 mL	00352005004894	Grey	No	
015	0229_MW116_201028	HDPE (no PTFE)	20 mL	00352005017667	Grey	No	
015	0229_MW116_201028	HDPE (no PTFE)	20 mL	00352005004979	Grey	No	
016	0229_MW115_201028	HDPE (no PTFE)	20 mL	00352005004882	Grey	No	
016	0229_MW115_201028	HDPE (no PTFE)	20 mL	00352005004964	Grey	No	
017	0229_MW002_201028	HDPE (no PTFE)	20 mL	00352005017713	Grey	No	
017	0229_MW002_201028	HDPE (no PTFE)	20 mL	00352005004941	Grey	No	
018	0229_SD135_201028	HDPE Soil Jar	200 mL	00620219019633	Grey	No	
019	0229_SW135_201028	HDPE (no PTFE)	20 mL	00352005005022	Grey	No	
019	0229_SW135_201028	HDPE (no PTFE)	20 mL	00352005017664	Grey	No	
020	0229_SD120_201028	HDPE Soil Jar	200 mL	00620219019639	Grey	No	
021	0229_MW018_201028	HDPE (no PTFE)	20 mL	00352005004874	Grey	No	
021	0229_MW018_201028	HDPE (no PTFE)	20 mL	00352005017651	Grey	No	
022	0229_QC102_201028	HDPE (no PTFE)	20 mL	00352005003620	Grey	No	
022	0229_QC102_201028	HDPE (no PTFE)	20 mL	00352005003521	Grey	No	
023	0229_MW114_201028	HDPE (no PTFE)	20 mL	00352005004895	Grey	No	
023	0229_MW114_201028	HDPE (no PTFE)	20 mL	00352005017703	Grey	No	
023	0229_MW114_201028	HDPE (no PTFE)	20 mL	00352005004868	Grey	No	
023	0229_MW114_201028	HDPE (no PTFE)	20 mL	00352005004847	Grey	No	
024	0229_QC300_201028	HDPE (no PTFE)	20 mL	00352005004861	Grey	No	
024	0229_QC300_201028	HDPE (no PTFE)	20 mL	00352005004851	Grey	No	
025	0229_MW123_I_201028	HDPE (no PTFE)	20 mL	00352005017652	Grey	No	
025	0229_MW123_I_201028	HDPE (no PTFE)	20 mL	00352005017697	Grey	No	
026	0229_MW139_201028	HDPE (no PTFE)	20 mL	00352005003558	Grey	No	

CHAIN OF CUSTODY
 (ALS) COC#: 15322 ALS Laboratory: ET Townsville

RELINQUISHED BY:

RECEIVED BY:

RELINQUISHED BY:

RECEIVED BY:

DATE TIME:

DATE TIME:

DATE TIME:

DATE TIME:

CLIENT: AECOMAU - AECOM Australia Pty Ltd

PROJECT: QLD_0229_PFSOMP_20

SITE: QLD_0229

ORDER NO: 60612487_2.2

PROJECT MANAGER: [REDACTED]
 PRIMARY SAMPLER: [REDACTED]

CONTACT PH: [REDACTED]
 QUOTE NO: TV/123/20

SAMPLER MOBILE:
 / ET2020AECOMAU000
 1

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

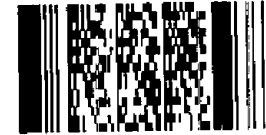
Other comments:

026	0229_MW139_201028	HDPE (no PTFE)	20 mL	00352005003378	Grey	No
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Total Bottle Count: ALS: 54, Non ALS: 0



Environmental Division
 Townsville
 Work Order Reference
ET2004277



Telephone : +61 7 4773 0000

Custody Document for Submissions via ALS Compass App

Project: QLD_0229_PFA50MP_20 Client: AECOMALM Project Manager: _____
 Phone: (_____) _____

ALS Compass COC Reference: 15323 # Samples: _____ Sampler: _____
 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:	Received by:	Relinquished by:	Received by:
Date / Time:	Date / Time:	Date / Time:	Date / Time:
29/10/2020	29/10/20 17:05		

**CHAIN OF CUSTODY**

ALS COC#: 15323 ALS Laboratory: ET Townsville

CLIENT: AECOMAU - AECOM Australia Pty Ltd

PROJECT: QLD_0229_PFASOMP_20

SITE: QLD_0229

ORDER NO: 60612487_3.1

PROJECT MANAGER: [REDACTED]
PRIMARY SAMPLER: [REDACTED]CONTACT PH: [REDACTED] SAMPLER MOBILE: [REDACTED]
QUOTE NO: TV/123/20 / ET2020AECOMAU000
1

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	ANALYSIS REQUIRED			ADDITIONAL INFORMATION
							PFAS Sediments SEDIMENT	PFAS Waters WATER	ALTERNATIVE ANALYSIS	
001	0229_MW226_201029		29/10/2020 07:23 AM	Water	ALS: 2 Non ALS: 0	No		X		
002	0229_MW003_201029		29/10/2020 07:56 AM	Water	ALS: 2 Non ALS: 0	No		X		
003	0229_MW138_201029		29/10/2020 08:14 AM	Water	ALS: 2 Non ALS: 0	No		X		
004	0229_SD139_201029		29/10/2020 08:40 AM	Soil	ALS: 1 Non ALS: 0	No	X			
005	0229_QC103_201029		29/10/2020 08:41 AM	Soil	ALS: 1 Non ALS: 0	No	X			
006	0229_SW139_201029		29/10/2020 08:42 AM	Water	ALS: 2 Non ALS: 0	No		X		
007	0229_QC102_201029		29/10/2020 08:43 AM	Water	ALS: 2 Non ALS: 0	No		X		
008	0229_MW128_201029		29/10/2020 09:07 AM	Water	ALS: 2 Non ALS: 0	No		X		
009	0229_MW105_201029		29/10/2020 09:08 AM	Water	ALS: 2 Non ALS: 0	No		X		

**CHAIN OF CUSTODY**

ALS COC#: 15323 ALS Laboratory: ET Townsville

CLIENT: AECOMAU - AECOM Australia Pty Ltd

PROJECT: QLD_0229_PFSOMP_20

SITE: QLD_0229

ORDER NO: 60612487_3.1

PROJECT MANAGER: [REDACTED]
PRIMARY SAMPLER: [REDACTED]CONTACT PH: [REDACTED] SAMPLER MOBILE: [REDACTED]
QUOTE NO: TV/123/20 / ET2020AECOMAU000
1

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	ANALYSIS REQUIRED			ADDITIONAL INFORMATION
							PFAS Sediments SEDIMENT	PFAS Waters WATER	ALTERNATIVE ANALYSIS	
010	0229_SD110_201029		29/10/2020 09:22 AM	Soil	ALS: 1 Non ALS: 0	No	X			
011	0229_SD109_201029		29/10/2020 09:43 AM	Soil	ALS: 1 Non ALS: 0	No	X			
012	0229_MW123_S_201029		29/10/2020 10:06 AM	Water	ALS: 2 Non ALS: 0	No		X		
013	0229_MW065_201029		29/10/2020 10:31 AM	Water	ALS: 2 Non ALS: 0	No		X		
014	0229_QC104_201029		29/10/2020 10:33 AM	Water	ALS: 2 Non ALS: 0	No		X		
015	0229_MW122_201029		29/10/2020 10:56 AM	Water	ALS: 2 Non ALS: 0	No		X		
016	0229_SW140_201029		29/10/2020 11:27 AM	Water	ALS: 2 Non ALS: 0	No		X		
017	0229_SD140_201029		29/10/2020 11:28 AM	Soil	ALS: 1 Non ALS: 0	No	X			
018	0229_MW102_201029		29/10/2020 11:52 AM	Water	ALS: 4 Non ALS: 0	No		X		Extra vol for lab QC

**CHAIN OF CUSTODY**

COC#: 15323 ALS Laboratory: ET Townsville

CLIENT: AECOMAU - AECOM Australia Pty Ltd

PROJECT: QLD_0229_PFASOMP_20

SITE: QLD_0229

ORDER NO: 60612487_3.1

PROJECT MANAGER: [REDACTED]
PRIMARY SAMPLER: [REDACTED]CONTACT PH: [REDACTED] SAMPLER MOBILE: [REDACTED]
QUOTE NO: TV/123/20 / ET2020AECOMAU000
1

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	ANALYSIS REQUIRED			ADDITIONAL INFORMATION
							PFAS Sediments SEDIMENT	PFAS Waters WATER	ALTERNATIVE ANALYSIS	
019	0229_MW101_201029	Extra volume for lab QC	29/10/2020 12:06 PM	Water	ALS: 4 Non ALS: 0	No		X		
020	0229_MW120_201029		29/10/2020 01:00 PM	Water	ALS: 2 Non ALS: 0	No		X		
021	0229_MW121_201029		29/10/2020 01:14 PM	Water	ALS: 2 Non ALS: 0	No		X		
022	0229_SW119_201029		29/10/2020 01:44 PM	Water	ALS: 2 Non ALS: 0	No		X		
023	0229_SD119_201029		29/10/2020 01:45 PM	Water	ALS: 1 Non ALS: 0	No	X			
024	0229_SD137_201029		29/10/2020 02:13 PM	Soil	ALS: 1 Non ALS: 0	No	X			
025	0229_QC105_201029		29/10/2020 02:14 PM	Soil	ALS: 1 Non ALS: 0	No	X			
026	0229_SW121_201029		29/10/2020 02:45 PM	Water	ALS: 2 Non ALS: 0	No		X		
027	0229_SD121_201029		29/10/2020 02:46 PM	Soil	ALS: 1 Non ALS: 0	No	X			Highly organic



CHAIN OF CUSTODY

COC#: 15323 ALS Laboratory: ET Townsville

RELINQUISHED BY:

RECEIVED BY:

RELINQUISHED BY:

RECEIVED BY:

DATE TIME:

DATE TIME:

DATE TIME:

DATE TIME:

CLIENT: AECOMAU - AECOM Australia Pty Ltd

PROJECT: QLD_0229_PFASOMP_20

SITE: QLD_0229

ORDER NO: 60612487_3.1

PROJECT MANAGER: [REDACTED]
PRIMARY SAMPLER: [REDACTED]

CONTACT PH: [REDACTED]
QUOTE NO: TV/123/20

SAMPLER MOBILE:
/ ET2020AECOMAU000
1

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

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

Random Sample Temperature on Receipt: °C

Other comments:

EMAIL REPORTS TO: [REDACTED]

EMAIL INVOICES TO: [REDACTED]

SAMPLE DETAILS

ANALYSIS REQUIRED

SAMPLE	NAME	DESCRIPTION	DATE / TIME	MATRIX	TOTAL BOTTLES	ON HOLD	ANALYSIS REQUIRED			
							PFAS Sediments SEDIMENT	PFAS Waters WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
028	0229_SD133_201029		29/10/2020 03:17 PM	Soil	ALS: 1 Non ALS: 0	No	X			
029	0229_SW134_201029		29/10/2020 03:24 PM	Water	ALS: 2 Non ALS: 0	No		X		
030	0229_SD134_201029		29/10/2020 03:25 PM	Water	ALS: 1 Non ALS: 0	No	X			
031	0229_SW132_201029		29/10/2020 03:42 PM	Water	ALS: 2 Non ALS: 0	No		X		
032	0229_SD132_201029		29/10/2020 03:43 PM	Soil	ALS: 1 Non ALS: 0	No	X			
033	0229_SD130_201029		29/10/2020 03:57 PM	Soil	ALS: 1 Non ALS: 0	No	X			
034	0229_SD129_201029		29/10/2020 04:07 PM	Water	ALS: 1 Non ALS: 0	No	X			
035	0229_SD128_201029		29/10/2020 04:11 PM	Soil	ALS: 1 Non ALS: 0	No	X			
036	0229_SD126_201029		29/10/2020 04:33 PM	Soil	ALS: 1 Non ALS: 0	No	X			



CHAIN OF CUSTODY

ALS COC#: 15323 ALS Laboratory: ET Townsville

RELINQUISHED BY:

RECEIVED BY:

RELINQUISHED BY:

RECEIVED BY:

DATE TIME:

DATE TIME:

DATE TIME:

DATE TIME:

CLIENT: AECOMAU - AECOM Australia Pty Ltd

PROJECT: QLD_0229_PFSOMP_20

SITE: QLD_0229

ORDER NO: 60612487_3.1

PROJECT MANAGER: [REDACTED]
PRIMARY SAMPLER: [REDACTED]

CONTACT PH: [REDACTED]
QUOTE NO: TV/123/20

SAMPLER MOBILE:
/ ET2020AECOMAU000
1

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

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

Random Sample Temperature on Receipt: °C

Other comments:

EMAIL REPORTS TO: [REDACTED]

EMAIL INVOICES TO: [REDACTED]

SAMPLE DETAILS

ANALYSIS REQUIRED

SAMPLE	NAME	DESCRIPTION	DATE / TIME	MATRIX	TOTAL BOTTLES	ON HOLD	ANALYSIS REQUIRED			ADDITIONAL INFORMATION
							PFAS Sediments SEDIMENT	PFAS Waters WATER	ALTERNATIVE ANALYSIS	
037	0229_QC301_201029		29/10/2020 04:37 PM	Water	ALS: 2 Non ALS: 0	No		X		

**CHAIN OF CUSTODY**

COCH#: 15323 ALS Laboratory: ET Townsville

RELINQUISHED BY:

RECEIVED BY:

RELINQUISHED BY:

RECEIVED BY:

DATE TIME:

DATE TIME:

DATE TIME:

DATE TIME:

CLIENT: AECOMAU - AECOM Australia Pty Ltd

PROJECT: QLD_0229_PFSOMP_20

SITE: QLD_0229

ORDER NO: 60612487_3.1

PROJECT MANAGER: [REDACTED]
PRIMARY SAMPLER: [REDACTED]CONTACT PH: [REDACTED] SAMPLER MOBILE: [REDACTED]
QUOTE NO: TV/123/20 / ET2020AECOMAU000
1

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

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

Random Sample Temperature on Receipt: °C

Other comments:

EMAIL REPORTS TO: [REDACTED]

EMAIL INVOICES TO: [REDACTED]

SAMPLE	SAMPLE NAME	BOTTLE NAME	VOLUME	BARCODE	TYPE	FILTERED	REASON
001	0229_MW226_201029	HDPE (no PTFE)	20 mL	00352005004870	Grey	No	
001	0229_MW226_201029	HDPE (no PTFE)	20 mL	00352005004989	Grey	No	
002	0229_MW003_201029	HDPE (no PTFE)	20 mL	00352005004876	Grey	No	
002	0229_MW003_201029	HDPE (no PTFE)	20 mL	00352005017657	Grey	No	
003	0229_MW138_201029	HDPE (no PTFE)	20 mL	00352005005009	Grey	No	
003	0229_MW138_201029	HDPE (no PTFE)	20 mL	00352005005031	Grey	No	
004	0229_SD138_201029	HDPE Soil Jar	200 mL	00620219019626	Grey	No	
005	0229_QC103_201029	HDPE Soil Jar	200 mL	00620219019655	Grey	No	
006	0229_SW139_201029	HDPE (no PTFE)	20 mL	00352005017712	Grey	No	
006	0229_SW139_201029	HDPE (no PTFE)	20 mL	00352005004873	Grey	No	
007	0229_QC102_201029	HDPE (no PTFE)	20 mL	00352005005017	Grey	No	
007	0229_QC102_201029	HDPE (no PTFE)	20 mL	00352005004917	Grey	No	
008	0229_MW128_201029	HDPE (no PTFE)	20 mL	00352005003622	Grey	No	
008	0229_MW128_201029	HDPE (no PTFE)	20 mL	00352005003531	Grey	No	
009	0229_MW105_201029	HDPE (no PTFE)	20 mL	00352005004913	Grey	No	
009	0229_MW105_201029	HDPE (no PTFE)	20 mL	00352005017680	Grey	No	
010	0229_SD110_201029	HDPE Soil Jar	200 mL	00620219019647	Grey	No	
011	0229_SD109_201029	HDPE Soil Jar	200 mL	00620219019669	Grey	No	
012	0229_MW123_S_201029	HDPE (no PTFE)	20 mL	00352005004945	Grey	No	
012	0229_MW123_S_201029	HDPE (no PTFE)	20 mL	00352005017656	Grey	No	
013	0229_MW065_201029	HDPE (no PTFE)	20 mL	00352005004907	Grey	No	
013	0229_MW065_201029	HDPE (no PTFE)	20 mL	00352005004969	Grey	No	
014	0229_QC104_201029	HDPE (no PTFE)	20 mL	00352005005040	Grey	No	
014	0229_QC104_201029	HDPE (no PTFE)	20 mL	00352005004846	Grey	No	
015	0229_MW122_201029	HDPE (no PTFE)	20 mL	00352005004940	Grey	No	
015	0229_MW122_201029	HDPE (no PTFE)	20 mL	00352005004935	Grey	No	



CHAIN OF CUSTODY

COC#: 15323 ALS Laboratory: ET Townsville

RELINQUISHED BY:

RECEIVED BY:

RELINQUISHED BY:

RECEIVED BY:

DATE TIME:

DATE TIME:

DATE TIME:

DATE TIME:

CLIENT: AECOMAU - AECOM Australia Pty Ltd

PROJECT: QLD_0229_PFSOMP_20

SITE: QLD_0229

ORDER NO: 60612487_3.1

PROJECT MANAGER: [Redacted]
PRIMARY SAMPLER: [Redacted]

CONTACT PH: [Redacted] SAMPLER MOBILE: [Redacted]
QUOTE NO: TV/123/20 / ET2020AECOMAU000
1

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

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

EMAIL REPORTS TO: [Redacted]

EMAIL INVOICES TO: [Redacted]

016	0229_SW140_201029	HDPE (no PTFE)	20 mL	00352005003508	Grey	No	
016	0229_SW140_201029	HDPE (no PTFE)	20 mL	00352005003595	Grey	No	
017	0229_SD140_201029	HDPE Soil Jar	200 mL	00620219019696	Grey	No	
018	0229_MW102_201029	HDPE (no PTFE)	20 mL	00352005005010	Grey	No	
018	0229_MW102_201029	HDPE (no PTFE)	20 mL	00352005004855	Grey	No	
018	0229_MW102_201029	HDPE (no PTFE)	20 mL	00352005004864	Grey	No	
018	0229_MW102_201029	HDPE (no PTFE)	20 mL	00352005004867	Grey	No	
019	0229_MW101_201029	HDPE (no PTFE)	20 mL	00352005003562	Grey	No	
019	0229_MW101_201029	HDPE (no PTFE)	20 mL	00352005004885	Grey	No	
019	0229_MW101_201029	HDPE (no PTFE)	20 mL	00352005017718	Grey	No	
019	0229_MW101_201029	HDPE (no PTFE)	20 mL	00352005003547	Grey	No	
020	0229_MW120_201029	HDPE (no PTFE)	20 mL	00352005003449	Grey	No	
020	0229_MW120_201029	HDPE (no PTFE)	20 mL	00352005003437	Grey	No	
021	0229_MW121_201029	HDPE (no PTFE)	20 mL	00352005017728	Grey	No	
021	0229_MW121_201029	HDPE (no PTFE)	20 mL	00352005004957	Grey	No	
022	0229_SW119_201029	HDPE (no PTFE)	20 mL	00352005004950	Grey	No	
022	0229_SW119_201029	HDPE (no PTFE)	20 mL	00352005004995	Grey	No	
023	0229_SD119_201029	HDPE Soil Jar	200 mL	00620719018153	Grey	No	
024	0229_SD137_201029	HDPE Soil Jar	200 mL	00620219019660	Grey	No	
025	0229_QC105_201029	HDPE Soil Jar	200 mL	00620719018161	Grey	No	
026	0229_SW121_201029	HDPE (no PTFE)	20 mL	00352005003556	Grey	No	
026	0229_SW121_201029	HDPE (no PTFE)	20 mL	00352005003420	Grey	No	
027	0229_SD121_201029	HDPE Soil Jar	200 mL	00620219019645	Grey	No	
028	0229_SD133_201029	HDPE Soil Jar	200 mL	00620219019605	Grey	No	
029	0229_SW134_201029	HDPE (no PTFE)	20 mL	00352005004959	Grey	No	
029	0229_SW134_201029	HDPE (no PTFE)	20 mL	00352005017674	Grey	No	
030	0229_SD134_201029	HDPE Soil Jar	200 mL	00621019114928	Grey	No	



CHAIN OF CUSTODY

COC#: 15323 ALS Laboratory: ET Townsville

RELINQUISHED BY:

RECEIVED BY:

RELINQUISHED BY:

RECEIVED BY:

DATE TIME:

DATE TIME:

DATE TIME:

DATE TIME:

CLIENT: AECOMAU - AECOM Australia Pty Ltd

PROJECT: QLD_0229_PFASOMP_20

SITE: QLD_0229

ORDER NO: 60612487_3.1

PROJECT MANAGER:
PRIMARY SAMPLER:

CONTACT PH:
QUOTE NO: TV/123/20

SAMPLER MOBILE:
/ ET2020AECOMAU000
1

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

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

Random Sample Temperature on Receipt: °C

Other comments:

EMAIL REPORTS TO:
EMAIL INVOICES TO:

031	0229_SW132_201029	HDPE (no PTFE)	20 mL	00352005003408	Grey	No	
031	0229_SW132_201029	HDPE (no PTFE)	20 mL	00352005003345	Grey	No	
032	0229_SD132_201029	HDPE Soil Jar	200 mL	00621019114912	Grey	No	
033	0229_SD130_201029	HDPE Soil Jar	200 mL	00620219019697	Grey	No	
034	0229_SD129_201029	HDPE Soil Jar	200 mL	00620719018159	Grey	No	
035	0229_SD128_201029	HDPE Soil Jar	200 mL	00620219019642	Grey	No	
036	0229_SD126_201029	HDPE Soil Jar	200 mL	00620219019609	Grey	No	
037	0229_QC301_201029	HDPE (no PTFE)	20 mL	00352005004999	Grey	No	
037	0229_QC301_201029	HDPE (no PTFE)	20 mL	00352005005038	Grey	No	

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



Environmental Division
 Townsville
 Work Order Reference
ET2004329



Telephone : +61 7 4773 0000

Custody Document for Submissions via ALS Compass App

Project: QLD_0229_PFA50MP_20 ~~0229010~~ Client: AECOMAU Project Manager: _____
 Phone: (_____)

ALS Compass COC Reference: 15443 # Samples: _____ Sampler: _____
 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:	Received by:	Relinquished by:	Received by:
Date / Time: <u>3/11/2020</u> <u>16:57</u>	Date / Time: <u>3/11/2020</u> <u>1700</u>	Date / Time:	Date / Time:

CHAIN OF CUSTODY
ALS COC#: 15443 ALS Laboratory: ET Townsville

RELINQUISHED BY:
DATE TIME:

RECEIVED BY:
DATE TIME:

RELINQUISHED BY:
DATE TIME:

RECEIVED BY:
DATE TIME:


CLIENT: AECOMAU - AECOM Australia Pty Ltd
 PROJECT: QLD_0229_PFASOMP_20
 SITE: QLD_0229
 ORDER NO: 60612487_3.1

TURNAROUND REQUIREMENTS : 5 Days
 Biohazard info:

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

PROJECT MANAGER: [REDACTED] CONTACT PH: SAMPLER MOBILE:
 PRIMARY SAMPLER: [REDACTED] QUOTE NO: TV/123/20 / ET2020AECOMAU000
 1
 EMAIL REPORTS TO: [REDACTED]
 EMAIL INVOICES TO: [REDACTED]

SAMPLE DETAILS							ANALYSIS REQUIRED			
SAMPLE	NAME	DESCRIPTION	DATE / TIME	MATRIX	TOTAL BOTTLES	ON HOLD	PFAS Sediments SEDIMENT	PFAS Waters WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
001	0229_MW125_S_201102		02/11/2020 10:17 AM	Water	ALS: 2 Non ALS: 0	No		X		
002	0229_MW125_I_201102		02/11/2020 10:18 AM	Water	ALS: 2 Non ALS: 0	No		X		
003	0229_MW124_201102	Extra volume for lab qc	02/11/2020 10:30 AM	Water	ALS: 4 Non ALS: 0	No		X		
004	0229_SD217_201102		02/11/2020 11:28 AM	Soil	ALS: 1 Non ALS: 0	No	X			
005	0229_QC107_201102		02/11/2020 11:28 AM	Soil	ALS: 1 Non ALS: 0	No	X			
006	0229_SW217_201102		02/11/2020 11:31 AM	Water	ALS: 2 Non ALS: 0	No		X		
007	0229_SD211_201102		02/11/2020 11:56 AM	Soil	ALS: 1 Non ALS: 0	No	X			
008	0229_SW211_201102		02/11/2020 11:57 AM	Water	ALS: 2 Non ALS: 0	No		X		
009	0229_SD212_201102		02/11/2020 12:25 PM	Soil	ALS: 1 Non ALS: 0	No	X			

 CHAIN OF CUSTODY COC#: 15443 ALS Laboratory: ET Townsville	RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
	DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

CLIENT: AECOMAU - AECOM Australia Pty Ltd	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: QLD_0229_PFASOMP_20		

SITE: QLD_0229	ORDER NO: 60612487_3.1	CONTACT PH:	SAMPLER MOBILE:
PROJECT MANAGER: [REDACTED]	PRIMARY SAMPLER: [REDACTED]	QUOTE NO: TV/123/20	/ ET2020AECOMAU000 1
EMAIL REPORTS TO: [REDACTED]	EMAIL INVOICES TO: [REDACTED]		

SAMPLE DETAILS							ANALYSIS REQUIRED			
SAMPLE	NAME	DESCRIPTION	DATE / TIME	MATRIX	TOTAL BOTTLES	ON HOLD	PFAS Sediments SEDIMENT	PFAS Waters WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
010	0229_SW212_201102		02/11/2020 12:26 PM	Water	ALS: 2 Non ALS: 0	No		X		
011	0229_SW233_201102		02/11/2020 01:53 PM	Water	ALS: 2 Non ALS: 0	No		X		
012	0229_SD233_201102		02/11/2020 01:54 PM	Soil	ALS: 1 Non ALS: 0	No	X			
013	0229_SW203_201102		02/11/2020 02:25 PM	Water	ALS: 2 Non ALS: 0	No		X		
014	0229_SD203_201102		02/11/2020 02:27 PM	Soil	ALS: 1 Non ALS: 0	No	X			
015	0229_SW205_201102		02/11/2020 03:16 PM	Water	ALS: 2 Non ALS: 0	No		X		
016	0229_SD205_201102		02/11/2020 03:17 PM	Soil	ALS: 1 Non ALS: 0	No	X			
017	0229_SD220_201102		02/11/2020 03:51 PM	Soil	ALS: 1 Non ALS: 0	No	X			
018	0229_SW220_201102		02/11/2020 03:52 PM	Water	ALS: 2 Non ALS: 0	No		X		

CHAIN OF CUSTODY
 (ALS) COC#: 15443 ALS Laboratory, ET Townsville

RELINQUISHED BY:
DATE TIME:

RECEIVED BY:
DATE TIME:

RELINQUISHED BY:
DATE TIME:

RECEIVED BY:
DATE TIME:

CLIENT: AECOMAU - AECOM Australia Pty Ltd
 PROJECT: QLD_0229_PFASOMP_20
 SITE: QLD_0229
 ORDER NO: 60612487_3.1
 PROJECT MANAGER: [REDACTED]
 PRIMARY SAMPLER: [REDACTED]
 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:

CONTACT PH: SAMPLER MOBILE:
 QUOTE NO: TV/123/20 / ET2020AECOMAU000
 1

SAMPLE DETAILS							ANALYSIS REQUIRED			
SAMPLE	NAME	DESCRIPTION	DATE / TIME	MATRIX	TOTAL BOTTLES	ON HOLD	PFAS Sediments SEDIMENT	PFAS Waters WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
028	0229_MW220_S_201103		03/11/2020 11:56 AM	Water	ALS: 2 Non ALS: 0	No		X		
029	0229_QC110_201103		03/11/2020 11:57 AM	Water	ALS: 2 Non ALS: 0	No		X		
030	0229_MW205_S_201103		03/11/2020 12:26 PM	Water	ALS: 2 Non ALS: 0	No		X		
031	0229_MW233_201103		03/11/2020 12:51 PM	Water	ALS: 2 Non ALS: 0	No		X		
032	0229_QC106_201102		02/11/2020 11:31 AM	Water	ALS: 2 Non ALS: 0	No		X		
033	0229_MW212_201103		03/11/2020 01:35 PM	Water	ALS: 2 Non ALS: 0	No		X		
034	0229_MW217_201103		03/11/2020 01:59 PM	Water	ALS: 2 Non ALS: 0	No		X		
035	0229_SD227_201103		03/11/2020 02:30 PM	Soil	ALS: 1 Non ALS: 0	No	X			
036	0229_QC109_201103		03/11/2020 03:36 PM	Soil	ALS: 1 Non ALS: 0	No	X			

CHAIN OF CUSTODY COC#: 15443 ALS Laboratory: ET Townsville	RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
	DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:

CLIENT: AECOMAU - AECOM Australia Pty Ltd

PROJECT: QLD_0229_PFASOMP_20	TURNAROUND REQUIREMENTS : 5 Days	LABORATORY USE ONLY (Circle)
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SITE: QLD_0229	Biohazard info:	Custody Seal intact? Yes No N/A
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ORDER NO: 60612487_3.1	CONTACT PH:	SAMPLER MOBILE:	Free ice / frozen ice bricks present upon receipt? Yes No N/A
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PROJECT MANAGER:	QUOTE NO: TV/123/20	/ ET2020AECOMAU000	Random Sample Temperature on Receipt: °C
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PRIMARY SAMPLER: [REDACTED]	1	Other comments:
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EMAIL REPORTS TO: [REDACTED]

EMAIL INVOICES TO: [REDACTED]

SAMPLE DETAILS							ANALYSIS REQUIRED			
SAMPLE	NAME	DESCRIPTION	DATE / TIME	MATRIX	TOTAL BOTTLES	ON HOLD	PFAS Sediments SEDIMENT	PFAS Waters WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
037	0229_SD244_201103		03/11/2020 01:33 PM	Soil	ALS: 1 Non ALS: 0	No	X			
038	0229_SD245_201103		03/11/2020 11:40 AM	Soil	ALS: 1 Non ALS: 0	No	X			
039	0229_SW227_201103		03/11/2020 02:45 PM	Water	ALS: 2 Non ALS: 0	No		X		
040	0229_SW244_201103		03/11/2020 01:30 PM	Water	ALS: 2 Non ALS: 0	No		X		
041	0229_SW245_201103		03/11/2020 09:30 AM	Water	ALS: 2 Non ALS: 0	No		X		
042	0229_QC108_201103		03/11/2020 03:42 PM	Water	ALS: 2 Non ALS: 0	No		X		
043	0229_QC303_201103		03/11/2020 04:15 PM	Water	ALS: 2 Non ALS: 0	No		X		
044	0229_MW232_201103	Extra volume for lab qc	03/11/2020 04:17 PM	Water	ALS: 4 Non ALS: 0	No		X		

 CHAIN OF CUSTODY COC#: 15443 ALS Laboratory: ET Townsville	RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:		
	DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:		
CLIENT: AECOMAU - AECOM Australia Pty Ltd	TURNAROUND REQUIREMENTS : 5 Days		LABORATORY USE ONLY (Circle)			
PROJECT: QLD_0229_PFSOMP_20	Biohazard info:	Custody Seal intact?	Yes	No	N/A	
SITE: QLD_0229	CONTACT PH:	SAMPLER MOBILE:	Free ice / frozen ice bricks present upon receipt?	Yes	No	N/A
ORDER NO: 60612487_3.1	QUOTE NO: TV/123/20	/ ET2020AECOMAU000	Random Sample Temperature on Receipt:	°C		
PROJECT MANAGER: [REDACTED]	Other comments:					
PRIMARY SAMPLER: [REDACTED]						
EMAIL REPORTS TO: [REDACTED]						
EMAIL INVOICES TO: [REDACTED]						

SAMPLE	SAMPLE NAME	BOTTLE NAME	VOLUME	BARCODE	TYPE	FILTERED	REASON
001	0229_MW125_S_201102	HDPE (no PTFE)	20 mL	00352005017663	Grey	No	
001	0229_MW125_S_201102	HDPE (no PTFE)	20 mL	00352005017710	Grey	No	
002	0229_MW125_I_201102	HDPE (no PTFE)	20 mL	00352005017683	Grey	No	
002	0229_MW125_I_201102	HDPE (no PTFE)	20 mL	00352005004906	Grey	No	
003	0229_MW124_201102	HDPE (no PTFE)	20 mL	00352005004880	Grey	No	
003	0229_MW124_201102	HDPE (no PTFE)	20 mL	00352005004871	Grey	No	
003	0229_MW124_201102	HDPE (no PTFE)	20 mL	00352005004923	Grey	No	
003	0229_MW124_201102	HDPE (no PTFE)	20 mL	00352005004992	Grey	No	
004	0229_SD217_201102	HDPE Soil Jar	200 mL	00620219019681	Grey	No	
005	0229_QC107_201102	HDPE Soil Jar	200 mL	00620719018169	Grey	No	
006	0229_SW217_201102	HDPE (no PTFE)	20 mL	00352005003639	Grey	No	
006	0229_SW217_201102	HDPE (no PTFE)	20 mL	00352005003563	Grey	No	
007	0229_SD211_201102	HDPE Soil Jar	200 mL	00620219019610	Grey	No	
008	0229_SW211_201102	HDPE (no PTFE)	20 mL	00352005004924	Grey	No	
008	0229_SW211_201102	HDPE (no PTFE)	20 mL	00352005005020	Grey	No	
009	0229_SD212_201102	HDPE Soil Jar	200 mL	00620219019622	Grey	No	
010	0229_SW212_201102	HDPE (no PTFE)	20 mL	00352005004853	Grey	No	
010	0229_SW212_201102	HDPE (no PTFE)	20 mL	00352005017738	Grey	No	
011	0229_SW233_201102	HDPE (no PTFE)	20 mL	00352005003586	Grey	No	
011	0229_SW233_201102	HDPE (no PTFE)	20 mL	00352005003557	Grey	No	
012	0229_SD233_201102	HDPE Soil Jar	200 mL	00620719018150	Grey	No	
013	0229_SW203_201102	HDPE (no PTFE)	20 mL	00352005017691	Grey	No	
013	0229_SW203_201102	HDPE (no PTFE)	20 mL	00352005005026	Grey	No	
014	0229_SD203_201102	HDPE Soil Jar	200 mL	00620219019699	Grey	No	
015	0229_SW205_201102	HDPE (no PTFE)	20 mL	00352005005011	Grey	No	
015	0229_SW205_201102	HDPE (no PTFE)	20 mL	00352005005007	Grey	No	



CHAIN OF CUSTODY

COC#: 15443

ALS Laboratory: ET Townsville

RELINQUISHED BY:

DATE TIME:

RECEIVED BY:

DATE TIME:

RELINQUISHED BY:

DATE TIME:

RECEIVED BY:

DATE TIME:

CLIENT: AECOMAU - AECOM Australia Pty Ltd

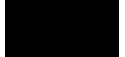
PROJECT: QLD_0229_PFSOMP_20

SITE: QLD_0229

ORDER NO: 60612487_3.1

PROJECT MANAGER:

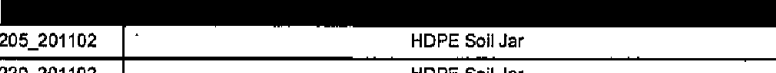
PRIMARY SAMPLER:



EMAIL REPORTS TO:



EMAIL INVOICES TO:



CONTACT PH:

QUOTE NO: TV/123/20

SAMPLER MOBILE:

/ ET2020AECOMAU000

1

TURNAROUND REQUIREMENTS: 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

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

Random Sample Temperature on Receipt: °C

Other comments:

016	0229_SD205_201102	HDPE Soil Jar	200 mL	00620219019811	Grey	No	
017	0229_SD220_201102	HDPE Soil Jar	200 mL	00621019114871	Grey	No	
018	0229_SW220_201102	HDPE (no PTFE)	20 mL	00352005004925	Grey	No	
018	0229_SW220_201102	HDPE (no PTFE)	20 mL	00352005017724	Grey	No	
019	0229_SD243_201102	HDPE Soil Jar	200 mL	00620719018158	Grey	No	
020	0229_SW243_201102	HDPE (no PTFE)	20 mL	00352005004971	Grey	No	
020	0229_SW243_201102	HDPE (no PTFE)	20 mL	00352005017734	Grey	No	
021	0229_SW232_201102	HDPE (no PTFE)	20 mL	00352005003503	Grey	No	
021	0229_SW232_201102	HDPE (no PTFE)	20 mL	00352005003496	Grey	No	
022	0229_SD232_201102	HDPE Soil Jar	200 mL	00621019114870	Grey	No	
023	0229_SD242_201102	HDPE Soil Jar	200 mL	00620219019700	Grey	No	
024	0229_SW242_201102	HDPE (no PTFE)	20 mL	00352005004953	Grey	No	
024	0229_SW242_201102	HDPE (no PTFE)	20 mL	00352005004927	Grey	No	
025	0229_QC302_201102	HDPE (no PTFE)	20 mL	00352005004994	Grey	No	
025	0229_QC302_201102	HDPE (no PTFE)	20 mL	00352005004996	Grey	No	
026	0229_MW235_S_201103	HDPE (no PTFE)	20 mL	00352005005018	Grey	No	
026	0229_MW235_S_201103	HDPE (no PTFE)	20 mL	00352005017742	Grey	No	
027	0229_MW236_S_201103	HDPE (no PTFE)	20 mL	00352005005034	Grey	No	
027	0229_MW236_S_201103	HDPE (no PTFE)	20 mL	00352005017659	Grey	No	
027	0229_MW236_S_201103	HDPE (no PTFE)	20 mL	00352005004910	Grey	No	
027	0229_MW236_S_201103	HDPE (no PTFE)	20 mL	00352005017726	Grey	No	
028	0229_MW220_S_201103	HDPE (no PTFE)	20 mL	00352005017658	Grey	No	
028	0229_MW220_S_201103	HDPE (no PTFE)	20 mL	00352005004877	Grey	No	
029	0229_QC110_201103	HDPE (no PTFE)	20 mL	00352005005029	Grey	No	
029	0229_QC110_201103	HDPE (no PTFE)	20 mL	00352005017748	Grey	No	
030	0229_MW205_S_201103	HDPE (no PTFE)	20 mL	00352005005002	Grey	No	
030	0229_MW205_S_201103	HDPE (no PTFE)	20 mL	00352005004891	Grey	No	

RELINQUISHED BY:

RECEIVED BY:

RELINQUISHED BY:

RECEIVED BY:

DATE TIME:

DATE TIME:

DATE TIME:

DATE TIME:

CLIENT: AECOMAU - AECOM Australia Pty Ltd

PROJECT: QLD_0229_PFSOMP_20

SITE: QLD_0229

ORDER NO: 60612487_3.1

PROJECT MANAGER: [REDACTED]

PRIMARY SAMPLER: [REDACTED]

EMAIL REPORTS TO: [REDACTED]

EMAIL INVOICES TO: [REDACTED]

CONTACT PH: [REDACTED]

QUOTE NO: TV/123/20

SAMPLER MOBILE:

/ ET2020AECOMAU000
1

TURNAROUND REQUIREMENTS: 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

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

Random Sample Temperature on Receipt: °C

Other comments:

031	0229_MW233_201103	HDPE (no PTFE)	20 mL	00352005004975	Grey	No	
031	0229_MW233_201103	HDPE (no PTFE)	20 mL	00352005017650	Grey	No	
032	0229_QC106_201102	HDPE (no PTFE)	20 mL	00352005003516	Grey	No	
032	0229_QC106_201102	HDPE (no PTFE)	20 mL	00352005003426	Grey	No	
033	0229_MW212_201103	HDPE (no PTFE)	20 mL	00352005004985	Grey	No	
033	0229_MW212_201103	HDPE (no PTFE)	20 mL	00352005017746	Grey	No	
034	0229_MW217_201103	HDPE (no PTFE)	20 mL	00352005004866	Grey	No	
034	0229_MW217_201103	HDPE (no PTFE)	20 mL	00352005004990	Grey	No	
035	0229_SD227_201103	HDPE Soil Jar	200 mL	00621019114936	Grey	No	
036	0229_QC109_201103	HDPE Soil Jar	200 mL	00621019114888	Grey	No	
037	0229_SD244_201103	HDPE Soil Jar	200 mL	00620219019671	Grey	No	
038	0229_SD245_201103	HDPE Soil Jar	200 mL	00620219019657	Grey	No	
039	0229_SW227_201103	HDPE (no PTFE)	20 mL	00352005017690	Grey	No	
039	0229_SW227_201103	HDPE (no PTFE)	20 mL	00352005005027	Grey	No	
040	0229_SW244_201103	HDPE (no PTFE)	20 mL	00352005017731	Grey	No	
040	0229_SW244_201103	HDPE (no PTFE)	20 mL	00352005017706	Grey	No	
041	0229_SW245_201103	HDPE (no PTFE)	20 mL	00352005004944	Grey	No	
041	0229_SW245_201103	HDPE (no PTFE)	20 mL	00352005004862	Grey	No	
042	0229_QC108_201103	HDPE (no PTFE)	20 mL	00352005003613	Grey	No	
042	0229_QC108_201103	HDPE (no PTFE)	20 mL	00352005003548	Grey	No	
043	0229_QC303_201103	HDPE (no PTFE)	20 mL	00352005017723	Grey	No	
043	0229_QC303_201103	HDPE (no PTFE)	20 mL	00352005004849	Grey	No	
044	0229_MW232_201103	HDPE (no PTFE)	20 mL	00352005004856	Grey	No	
044	0229_MW232_201103	HDPE (no PTFE)	20 mL	00352005004898	Grey	No	
044	0229_MW232_201103	HDPE (no PTFE)	20 mL	00352005017681	Grey	No	
044	0229_MW232_201103	HDPE (no PTFE)	20 mL	00352005017733	Grey	No	

Total Bottle Count: ALS: 79, Non ALS: 0

Appendix E

Laboratory Analytical Certificates and QA/QC Reports

CERTIFICATE OF ANALYSIS

Work Order	: ET2004260	Page	: 1 of 19
Amendment	: 2		
Client	: AECOM Australia Pty Ltd	Laboratory	: Environmental Division Townsville
Contact	: [REDACTED]	Contact	: [REDACTED]
Address	: [REDACTED]	Address	: [REDACTED]
Telephone	: [REDACTED]	Telephone	: [REDACTED]
Project	: QLD_0229_PFASOMP_20	Date Samples Received	: 28-Oct-2020 17:15
Order number	: 60621487 task 3.1	Date Analysis Commenced	: 30-Oct-2020
C-O-C number	: 15322	Issue Date	: 19-Nov-2020 11:05
Sampler	: [REDACTED]		
Site	: QLD_0229		
Quote number	: TV/123/20		
No. of samples received	: 26		
No. of samples analysed	: 26		



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. 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.

<i>Signatories</i>	<i>Position</i>	<i>Accreditation Category</i>
[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]	[REDACTED]



General Comments

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

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

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

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

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

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contact 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
∅ = ALS is not NATA accredited for these tests.
~ = Indicates an estimated value.

- EP231X PFAS: Sample 0229_SD113_201028 shows poor matrix spike recovery due to matrix interference. Confirmed by re-extraction and re-analysis.
- EP231X-INJ PFAS: The LOR for PFBA has been raised for sample 0229_MW131_201028 and 0229_MW115_201028 due to matrix interference.
- EP231X-INJ PFAS: The LOR for PFPeA has been raised for samples 0229_MW135_201028, 0229_QC100_201028 and 0229_MW115_201028 due to matrix interference.
- 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.
- **Amendment (19/11/2020): This report has been amended as a result of a request to change sample #22 ID from 0229_QC102_201028 to 0229_QC101_201028 received by ALS from [REDACTED] on 18.11.20. All analysis results are as per the previous report.**
- Amendment-1 (09/11/2020): This report has been amended to alter the sub-matrixes of some samples. All analysis results are as per the previous report.
- EP231X PFAS: Samples '0229_MW117_S_201028' and '0229_MW114_201028' required dilution due to the presence of high level contaminants. LOR values have been adjusted accordingly.
- EP231X PFAS: Particular samples required dilution prior to extraction due to matrix interferences. LOR values have been adjusted accordingly.
- All analysis will be conducted by ALS Environmental, Brisbane, NATA accreditation no. 825, Site No. 818.
- EP231X-INJ PFAS by LCMSMS: Particular samples have been tested to the legacy QSM 5.1 aligned, NATA accredited method due to sample matrix being unsuitable for SPE extraction (high sediment content).
- 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.
- 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, PFTTrDA 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.
- EP231X-INJ: The direct injection LCMSMS method may be used where the sample matrix is not suitable for Solid Phase Extraction (e.g. significant particulate load) or where only a single sample container is received.



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	0229_SD136_201028	0229_SD113_201028	0229_SD135_201028	0229_SD120_201028	----
Client sampling date / time				28-Oct-2020 08:25	28-Oct-2020 11:29	28-Oct-2020 15:00	28-Oct-2020 15:20	----	----
Compound	CAS Number	LOR	Unit	ET2004260-001	ET2004260-008	ET2004260-018	ET2004260-020	-----	-----
				Result	Result	Result	Result	----	----
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content	----	0.1	%	25.6	21.1	21.6	5.3	----	----
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	0.0003	<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	0.0015	0.0005	0.0005	<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	----	----
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	<0.0005	----	----



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	0229_SD136_201028	0229_SD113_201028	0229_SD135_201028	0229_SD120_201028	----
Client sampling date / time					28-Oct-2020 08:25	28-Oct-2020 11:29	28-Oct-2020 15:00	28-Oct-2020 15:20	----
Compound	CAS Number	LOR	Unit	ET2004260-001	ET2004260-008	ET2004260-018	ET2004260-020	-----	
				Result	Result	Result	Result	----	
EP231C: Perfluoroalkyl Sulfonamides - Continued									
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	0.0018	0.0005	0.0005	<0.0002	----	
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg	0.0018	0.0005	0.0005	<0.0002	----	
Sum of PFAS (WA DER List)	----	0.0002	mg/kg	0.0018	0.0005	0.0005	<0.0002	----	
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.0002	%	94.5	83.0	98.0	106	----	
13C8-PFOA	----	0.0002	%	99.5	100	100	108	----	



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	0229_MW119_201028	0229_MW118_201028	0229_MW117_D_2010 28	0229_MW117_S_2010 28	0229_MW141_201028
Client sampling date / time					28-Oct-2020 09:17	28-Oct-2020 09:43	28-Oct-2020 10:16	28-Oct-2020 10:16	28-Oct-2020 10:57
Compound	CAS Number	LOR	Unit	ET2004260-002	ET2004260-003	ET2004260-004	ET2004260-005	ET2004260-006	
				Result	Result	Result	Result	Result	
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	0.13	0.04	<0.02	1.25	0.27	
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	<0.02	<0.02	1.48	0.24	
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.02	µg/L	0.04	0.04	0.02	19.2	1.68	
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	<0.02	<0.02	0.78	0.07	
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.01	0.02	6.32	0.64	
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	<0.02	<0.02	<0.04	<0.02	
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	<0.1	<0.1	0.4	<0.1	
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	0.22	<0.02	<0.02	0.52	0.09	
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	0.20	<0.02	<0.02	3.70	0.49	
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	0.11	<0.02	<0.02	0.31	0.03	
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	0.05	<0.01	<0.01	0.50	0.07	
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	<0.02	<0.02	0.04	<0.02	
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	<0.02	<0.02	<0.04	<0.02	
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	<0.02	<0.02	<0.04	<0.02	
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	<0.02	<0.02	<0.04	<0.02	
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	<0.02	<0.02	<0.04	<0.02	
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	<0.05	<0.05	<0.09	<0.05	
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	<0.02	<0.02	<0.04	<0.02	
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	<0.05	<0.05	<0.09	<0.05	
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	<0.05	<0.05	<0.09	<0.05	



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	0229_MW119_201028	0229_MW118_201028	0229_MW117_D_2010 28	0229_MW117_S_2010 28	0229_MW141_201028
Client sampling date / time					28-Oct-2020 09:17	28-Oct-2020 09:43	28-Oct-2020 10:16	28-Oct-2020 10:16	28-Oct-2020 10:57
Compound	CAS Number	LOR	Unit	ET2004260-002	ET2004260-003	ET2004260-004	ET2004260-005	ET2004260-006	
				Result	Result	Result	Result	Result	
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	<0.05	<0.05	<0.09	<0.05	
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	<0.05	<0.05	<0.09	<0.05	
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	<0.02	<0.02	<0.04	<0.02	
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	<0.02	<0.02	<0.04	<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	0.06	<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	0.75	0.09	0.10	34.5	3.58	
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	0.04	0.05	0.04	25.5	2.32	
Sum of PFAS (WA DER List)	----	0.01	µg/L	0.75	0.09	0.10	32.2	3.27	
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%	95.7	98.9	102	102	95.1	
13C8-PFOA	----	0.02	%	98.5	97.6	97.8	109	95.7	



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID				
				0229_SW113_201028	0229_MW106_201028	0229_MW074_201028	0229_MW131_201028	0229_MW072_201028
Client sampling date / time				28-Oct-2020 11:28	28-Oct-2020 11:20	28-Oct-2020 11:57	28-Oct-2020 12:41	28-Oct-2020 12:42
Compound	CAS Number	LOR	Unit	ET2004260-007	ET2004260-009	ET2004260-010	ET2004260-011	ET2004260-012
				Result	Result	Result	Result	Result
EP231A: Perfluoroalkyl Sulfonic Acids								
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	----	----	----	0.53	----
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	----	----	----	0.44	----
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.02	µg/L	----	----	----	2.95	----
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	----	----	----	0.21	----
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	----	----	----	5.88	----
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	----	----	----	<0.02	----
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	0.08	0.05	5.93	----	4.55
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	0.03	<0.02	5.84	----	4.55
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.02	µg/L	0.19	0.12	41.1	----	39.0
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	<0.02	2.87	----	4.50
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	0.22	0.09	47.9	----	80.7
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	<0.02	<0.48	----	<0.47
EP231B: Perfluoroalkyl Carboxylic Acids								
Perfluorobutanoic acid (PFBA)	375-22-4	0.10	µg/L	----	----	----	<0.50	----
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	----	----	----	0.20	----
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	----	----	----	1.08	----
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	----	----	----	0.17	----
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	----	----	----	0.28	----
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	----



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	0229_SW113_201028	0229_MW106_201028	0229_MW074_201028	0229_MW131_201028	0229_MW072_201028
Client sampling date / time					28-Oct-2020 11:28	28-Oct-2020 11:20	28-Oct-2020 11:57	28-Oct-2020 12:41	28-Oct-2020 12:42
Compound	CAS Number	LOR	Unit	ET2004260-007	ET2004260-009	ET2004260-010	ET2004260-011	ET2004260-012	
				Result	Result	Result	Result	Result	
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	----	----	----	<0.02	----	
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	----	----	----	<0.05	----	
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	0.2	<0.1	<2.4	----	<2.4	
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	0.06	<0.02	1.96	----	1.61	
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	0.20	0.02	10.2	----	8.82	
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	0.02	<0.02	1.48	----	1.14	
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	0.03	<0.01	2.68	----	2.94	
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	<0.02	1.44	----	4.17	
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	<0.02	<0.48	----	<0.47	
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	<0.02	<0.48	----	<0.47	
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	<0.02	<0.48	----	<0.47	
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	<0.02	<0.48	----	<0.47	
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	<0.05	<1.20	----	<1.18	
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	----	



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	0229_SW113_201028	0229_MW106_201028	0229_MW074_201028	0229_MW131_201028	0229_MW072_201028
Client sampling date / time					28-Oct-2020 11:28	28-Oct-2020 11:20	28-Oct-2020 11:57	28-Oct-2020 12:41	28-Oct-2020 12:42
Compound	CAS Number	LOR	Unit	ET2004260-007	ET2004260-009	ET2004260-010	ET2004260-011	ET2004260-012	ET2004260-012
				Result	Result	Result	Result	Result	Result
EP231C: Perfluoroalkyl Sulfonamides - Continued									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	<0.02	<0.48	----	<0.47	
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	<0.05	<1.20	----	<1.18	
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	<0.05	<1.20	----	<1.18	
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	<0.05	<1.20	----	<1.18	
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	<0.05	<1.20	----	<1.18	
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	<0.02	<0.48	----	<0.47	
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	<0.02	<0.48	----	<0.47	
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	----	----	----	0.07	----	
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	----	
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	<0.05	<0.48	----	<0.47	
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	<0.05	<0.48	----	<0.47	
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	<0.05	<0.48	----	<0.47	
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	<0.05	<0.48	----	<0.47	
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L	----	----	----	11.8	----	



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	0229_SW113_201028	0229_MW106_201028	0229_MW074_201028	0229_MW131_201028	0229_MW072_201028
Client sampling date / time				28-Oct-2020 11:28	28-Oct-2020 11:20	28-Oct-2020 11:57	28-Oct-2020 12:41	28-Oct-2020 12:42	
Compound	CAS Number	LOR	Unit	ET2004260-007	ET2004260-009	ET2004260-010	ET2004260-011	ET2004260-012	
				Result	Result	Result	Result	Result	
EP231P: PFAS Sums - Continued									
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	----	----	----	8.83	----	
Sum of PFAS (WA DER List)	----	0.01	µg/L	----	----	----	11.2	----	
Sum of PFAS	----	0.01	µg/L	1.03	0.28	121	----	152	
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	0.41	0.21	89.0	----	120	
Sum of PFAS (WA DER List)	----	0.01	µg/L	1.00	0.28	111	----	139	
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%	93.0	99.1	106	----	95.6	
13C4-PFOS	----	0.02	%	----	----	----	95.9	----	
13C8-PFOA	----	0.02	%	96.2	98.0	97.0	----	96.8	
13C8-PFOA	----	0.02	%	----	----	----	100	----	



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	0229_MW135_201028	0229_QC100_201028	0229_MW116_201028	0229_MW115_201028	0229_MW002_201028
Client sampling date / time					28-Oct-2020 13:37	28-Oct-2020 13:38	28-Oct-2020 14:14	28-Oct-2020 14:50	28-Oct-2020 14:58
Compound	CAS Number	LOR	Unit	ET2004260-013	ET2004260-014	ET2004260-015	ET2004260-016	ET2004260-017	ET2004260-017
				Result	Result	Result	Result	Result	Result
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	0.13	0.12	----	0.44	----	----
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	0.13	0.12	----	0.12	----	----
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.02	µg/L	1.73	1.60	----	0.54	----	----
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	0.13	0.12	----	0.02	----	----
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	2.37	1.94	----	0.55	----	----
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	<0.02	----	<0.02	----	----
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	----	----	0.06	----	0.06	0.06
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	----	----	0.03	----	0.03	0.03
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.02	µg/L	----	----	0.07	----	0.44	0.44
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	----	0.79	0.79
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	----	----	<0.02	----	<0.02	<0.02
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.10	µg/L	<0.10	<0.10	----	<1.10	----	----
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.10	<0.10	----	<0.10	----	----
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	0.11	0.11	----	0.26	----	----
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	0.07	0.07	----	0.02	----	----
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	----	----



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	0229_MW135_201028	0229_QC100_201028	0229_MW116_201028	0229_MW115_201028	0229_MW002_201028
Client sampling date / time					28-Oct-2020 13:37	28-Oct-2020 13:38	28-Oct-2020 14:14	28-Oct-2020 14:50	28-Oct-2020 14:58
Compound	CAS Number	LOR	Unit	ET2004260-013	ET2004260-014	ET2004260-015	ET2004260-016	ET2004260-017	
				Result	Result	Result	Result	Result	
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
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	----	
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	----	----	0.03	----	0.07	
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	----	0.02	
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	----	<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	----	



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	0229_MW135_201028	0229_QC100_201028	0229_MW116_201028	0229_MW115_201028	0229_MW002_201028
Client sampling date / time					28-Oct-2020 13:37	28-Oct-2020 13:38	28-Oct-2020 14:14	28-Oct-2020 14:50	28-Oct-2020 14:58
Compound	CAS Number	LOR	Unit	ET2004260-013	ET2004260-014	ET2004260-015	ET2004260-016	ET2004260-017	ET2004260-017
				Result	Result	Result	Result	Result	Result
EP231C: Perfluoroalkyl Sulfonamides - Continued									
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									
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	----	
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	4.69	4.10	----	1.95	----	



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	0229_MW135_201028	0229_QC100_201028	0229_MW116_201028	0229_MW115_201028	0229_MW002_201028
Client sampling date / time				28-Oct-2020 13:37	28-Oct-2020 13:38	28-Oct-2020 14:14	28-Oct-2020 14:50	28-Oct-2020 14:58	
Compound	CAS Number	LOR	Unit	ET2004260-013	ET2004260-014	ET2004260-015	ET2004260-016	ET2004260-017	
				Result	Result	Result	Result	Result	
EP231P: PFAS Sums - Continued									
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	4.10	3.54	----	1.09	----	
Sum of PFAS (WA DER List)	----	0.01	µg/L	4.43	3.86	----	1.81	----	
Sum of PFAS	----	0.01	µg/L	----	----	0.20	----	1.41	
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	----	----	0.08	----	1.23	
Sum of PFAS (WA DER List)	----	0.01	µg/L	----	----	0.17	----	1.38	
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%	----	----	96.6	----	96.4	
13C4-PFOS	----	0.02	%	120	86.5	----	96.8	----	
13C8-PFOA	----	0.02	%	----	----	97.2	----	100	
13C8-PFOA	----	0.02	%	111	99.7	----	103	----	



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	0229_SW135_201028	0229_MW018_201028	0229_QC101_201028	0229_MW114_201028	0229_QC300_201028
Client sampling date / time					28-Oct-2020 15:02	28-Oct-2020 15:48	28-Oct-2020 15:49	28-Oct-2020 16:05	28-Oct-2020 16:07
Compound	CAS Number	LOR	Unit	ET2004260-019	ET2004260-021	ET2004260-022	ET2004260-023	ET2004260-024	
				Result	Result	Result	Result	Result	
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	0.05	2.97	2.96	0.92	<0.02	
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	2.79	2.82	0.94	<0.02	
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.02	µg/L	0.16	15.3	15.9	5.29	<0.02	
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	1.11	1.09	0.21	<0.02	
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	0.52	22.1	21.6	0.48	<0.01	
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	<0.10	<0.10	<0.04	<0.02	
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	0.8	0.8	0.3	<0.1	
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	1.09	1.12	0.40	<0.02	
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	0.03	5.61	5.61	2.20	<0.02	
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	0.78	0.76	0.33	<0.02	
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	1.12	1.17	0.39	<0.01	
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	<0.10	<0.10	<0.04	<0.02	
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	<0.10	<0.10	<0.04	<0.02	
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	<0.10	<0.10	<0.04	<0.02	
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	<0.10	<0.10	<0.04	<0.02	
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	<0.10	<0.10	<0.04	<0.02	
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	<0.25	<0.24	<0.10	<0.05	
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	<0.10	<0.10	<0.04	<0.02	
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	<0.25	<0.24	<0.10	<0.05	
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	<0.25	<0.24	<0.10	<0.05	



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	0229_SW135_201028	0229_MW018_201028	0229_QC101_201028	0229_MW114_201028	0229_QC300_201028
Client sampling date / time					28-Oct-2020 15:02	28-Oct-2020 15:48	28-Oct-2020 15:49	28-Oct-2020 16:05	28-Oct-2020 16:07
Compound	CAS Number	LOR	Unit	ET2004260-019	ET2004260-021	ET2004260-022	ET2004260-023	ET2004260-024	
				Result	Result	Result	Result	Result	
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	<0.25	<0.24	<0.10	<0.05	
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	<0.25	<0.24	<0.10	<0.05	
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	<0.10	<0.10	<0.04	<0.02	
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	<0.10	<0.10	<0.04	<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	<0.10	<0.10	<0.05	<0.05	
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	<0.10	<0.10	<0.05	<0.05	
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	<0.10	<0.10	<0.05	<0.05	
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	<0.10	<0.10	<0.05	<0.05	
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L	0.76	53.7	53.8	11.5	<0.01	
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	0.68	37.4	37.5	5.77	<0.01	
Sum of PFAS (WA DER List)	----	0.01	µg/L	0.76	49.8	49.9	10.3	<0.01	
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%	99.3	105	102	102	95.0	
13C8-PFOA	----	0.02	%	97.8	97.1	99.7	111	101	



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID		0229_MW123_I_2010 28	0229_MW139_201028	----	----	----
Client sampling date / time				28-Oct-2020 16:49	28-Oct-2020 16:23	----	----	----	----	----
Compound	CAS Number	LOR	Unit	ET2004260-025 Result	ET2004260-026 Result	-----	-----	-----	-----	-----
EP231A: Perfluoroalkyl Sulfonic Acids										
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	0.30	0.10	----	----	----	----	----
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	0.22	0.13	----	----	----	----	----
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.02	µg/L	0.70	1.32	----	----	----	----	----
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.06	----	----	----	----	----
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	2.04	----	----	----	----	----
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	0.03	0.03	----	----	----	----	----
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	0.13	0.12	----	----	----	----	----
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	0.04	----	----	----	----	----
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	----	----	----	----	----



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	0229_MW123_I_2010 28	0229_MW139_201028	----	----	----
Client sampling date / time					28-Oct-2020 16:49	28-Oct-2020 16:23	----	----	----
Compound	CAS Number	LOR	Unit	ET2004260-025	ET2004260-026	-----	-----	-----	
				Result	Result	---	---	---	
EP231C: Perfluoroalkyl Sulfonamides - Continued									
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	1.38	3.89	----	----	----	
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	0.70	3.36	----	----	----	
Sum of PFAS (WA DER List)	----	0.01	µg/L	1.16	3.70	----	----	----	
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%	101	94.9	----	----	----	
13C8-PFOA	----	0.02	%	97.1	99.4	----	----	----	



Surrogate Control Limits

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

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 : ET2004260
Amendment : 2

Page : 1 of 14

Client : AECOM Australia Pty Ltd
Contact : [Redacted]
Address : [Redacted]
Telephone : ----
Project : QLD_0229_PFASOMP_20
Order number : 60621487 task 3.1
C-O-C number : 15322
Sampler : [Redacted]
Site : QLD_0229
Quote number : TV/123/20
No. of samples received : 26
No. of samples analysed : 26

Laboratory : Environmental Division Townsville
Contact : [Redacted]
Address : [Redacted]
Telephone : [Redacted]
Date Samples Received : 28-Oct-2020
Date Analysis Commenced : 30-Oct-2020
Issue Date : 19-Nov-2020



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. 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.

Table with 3 columns: Signatories, Position, Accreditation Category. Contains redacted information.



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

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	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
EA055: Moisture Content (Dried @ 105-110°C) (QC Lot: 3337643)									
EB2028508-001	Anonymous	EA055: Moisture Content	----	0.1	%	16.8	17.8	5.74	0% - 20%
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 3337641)									
ET2004260-001	0229_SD136_201028	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	<0.0002	0.00	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	<0.0002	0.00	No Limit
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	0.0003	0.0003	0.00	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	<0.0002	0.00	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	0.0015	0.0019	24.6	No Limit
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	<0.0002	0.00	No Limit		
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 3337641)									
ET2004260-001	0229_SD136_201028	EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	<0.0002	0.00	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	<0.0002	0.00	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	<0.0002	0.00	No Limit
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	<0.0002	0.00	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	<0.0002	0.00	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	<0.0002	0.00	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.00	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	<0.0002	0.00	No Limit
		EP231X: Perfluorotridecanoic acid (PFTTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.00	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	<0.0005	0.00	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	<0.001	0.00	No Limit
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 3337641)									
ET2004260-001	0229_SD136_201028	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	<0.0002	0.00	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	<0.0002	0.00	No Limit



Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 3337641) - continued									
ET2004260-001	0229_SD136_201028	EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	<0.0002	0.00	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	<0.0005	0.00	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	<0.0005	0.00	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	<0.0005	0.00	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	<0.0005	0.00	No Limit
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 3337641)									
ET2004260-001	0229_SD136_201028	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	<0.0005	0.00	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	<0.0005	0.00	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	<0.0005	0.00	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	<0.0005	0.00	No Limit

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 3337841)									
ET2004260-005	0229_MW117_S_201028	EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	6.32	6.72	6.25	0% - 20%
		EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	1.25	1.21	2.86	0% - 20%
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	1.48	1.39	6.40	0% - 20%
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.02	µg/L	19.2	19.0	1.33	0% - 20%
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	0.78	0.89	13.3	0% - 20%
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.04	<0.04	0.00	No Limit
ET2004260-023	0229_MW114_201028	EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	0.48	0.41	14.4	0% - 50%
		EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	0.92	0.80	13.3	0% - 20%
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	0.94	0.78	18.8	0% - 20%
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.02	µg/L	5.29	4.37	19.1	0% - 20%
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	0.21	0.17	21.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.04	<0.03	0.00	No Limit
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 3340842)									
EB2028561-008	Anonymous	EP231X-INJ: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	<0.01	0.00	No Limit
		EP231X-INJ: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	<0.02	0.00	No Limit



Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report						
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)	
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 3340842) - continued										
EB2028561-008	Anonymous	EP231X-INJ: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	<0.02	0.00	No Limit	
		EP231X-INJ: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.02	µg/L	<0.02	<0.02	0.00	No Limit	
		EP231X-INJ: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	<0.02	0.00	No Limit	
		EP231X-INJ: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	<0.02	0.00	No Limit	
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 3337841)										
ET2004260-005	0229_MW117_S_201028	EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	0.50	0.50	0.00	0% - 50%	
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	0.52	0.51	0.00	0% - 50%	
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	3.70	3.67	0.760	0% - 20%	
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	0.31	0.30	0.00	No Limit	
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	0.04	0.05	0.00	No Limit	
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.04	<0.04	0.00	No Limit	
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.04	<0.04	0.00	No Limit	
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.04	<0.04	0.00	No Limit	
		EP231X: Perfluorotridecanoic acid (PFTTrDA)	72629-94-8	0.02	µg/L	<0.04	<0.04	0.00	No Limit	
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.09	<0.09	0.00	No Limit	
ET2004260-023	0229_MW114_201028	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	0.4	0.4	0.00	No Limit	
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	0.39	0.34	15.5	0% - 50%	
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	0.40	0.34	14.5	0% - 50%	
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	2.20	1.84	18.0	0% - 20%	
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	0.33	0.27	19.3	No Limit	
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.04	<0.03	0.00	No Limit	
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.04	<0.03	0.00	No Limit	
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.04	<0.03	0.00	No Limit	
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.04	<0.03	0.00	No Limit	
		EP231X: Perfluorotridecanoic acid (PFTTrDA)	72629-94-8	0.02	µg/L	<0.04	<0.03	0.00	No Limit	
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 3340842)	EB2028561-008	Anonymous	EP231X-INJ: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	<0.01	0.00	No Limit
			EP231X-INJ: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	<0.02	0.00	No Limit
			EP231X-INJ: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	<0.02	0.00	No Limit
			EP231X-INJ: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	<0.02	0.00	No Limit
			EP231X-INJ: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	<0.02	0.00	No Limit
			EP231X-INJ: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	<0.02	0.00	No Limit
			EP231X-INJ: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	<0.02	0.00	No Limit
			EP231X-INJ: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	<0.02	0.00	No Limit



Sub-Matrix: WATER				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 3340842) - continued									
EB2028561-008	Anonymous	EP231X-INJ: Perfluorotridecanoic acid (PFTTrDA)	72629-94-8	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X-INJ: Perfluorotetradecanoic acid (PFTTeDA)	376-06-7	0.05	µg/L	<0.05	<0.05	0.00	No Limit
		EP231X-INJ: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.10	<0.10	0.00	No Limit
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 3337841)									
ET2004260-005	0229_MW117_S_201028	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.04	<0.04	0.00	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.04	<0.04	0.00	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.04	<0.04	0.00	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.09	<0.09	0.00	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.09	<0.09	0.00	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.09	<0.09	0.00	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.09	<0.09	0.00	No Limit
ET2004260-023	0229_MW114_201028	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.04	<0.03	0.00	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.04	<0.03	0.00	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.04	<0.03	0.00	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.10	<0.09	0.00	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.10	<0.09	0.00	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.10	<0.09	0.00	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.10	<0.09	0.00	No Limit
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 3340842)									
EB2028561-008	Anonymous	EP231X-INJ: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X-INJ: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X-INJ: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X-INJ: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	<0.05	0.00	No Limit



Sub-Matrix: WATER				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 3340842) - continued									
EB2028561-008	Anonymous	EP231X-INJ: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	<0.05	0.00	No Limit
		EP231X-INJ: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	<0.05	0.00	No Limit
		EP231X-INJ: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	<0.05	0.00	No Limit
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 3337841)									
ET2004260-005	0229_MW117_S_201028	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	<0.05	0.00	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	<0.05	0.00	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	<0.05	0.00	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	<0.05	0.00	No Limit
ET2004260-023	0229_MW114_201028	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	<0.05	0.00	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	<0.05	0.00	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	<0.05	0.00	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	<0.05	0.00	No Limit
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 3340842)									
EB2028561-008	Anonymous	EP231X-INJ: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	<0.05	0.00	No Limit
		EP231X-INJ: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	<0.05	0.00	No Limit
		EP231X-INJ: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	<0.05	0.00	No Limit
		EP231X-INJ: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	<0.05	0.00	No Limit
EP231P: PFAS Sums (QC Lot: 3337841)									
ET2004260-005	0229_MW117_S_201028	EP231X: Sum of PFAS	----	0.01	µg/L	34.5	34.6	0.405	0% - 20%
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	25.5	25.7	0.781	0% - 20%
		EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	32.2	32.3	0.341	0% - 20%
ET2004260-023	0229_MW114_201028	EP231X: Sum of PFAS	----	0.01	µg/L	11.5	9.62	17.4	0% - 20%
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	5.77	4.78	18.8	0% - 20%
		EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	10.3	8.67	17.3	0% - 20%



Sub-Matrix: **WATER**

				<i>Laboratory Duplicate (DUP) Report</i>					
<i>Laboratory sample ID</i>	<i>Client sample ID</i>	<i>Method: Compound</i>	<i>CAS Number</i>	<i>LOR</i>	<i>Unit</i>	<i>Original Result</i>	<i>Duplicate Result</i>	<i>RPD (%)</i>	<i>Recovery Limits (%)</i>
EP231P: PFAS Sums (QC Lot: 3340842)									
EB2028561-008	Anonymous	EP231X-INJ: Sum of PFAS	----	0.01	µg/L	<0.01	<0.01	0.00	No Limit
		EP231X-INJ: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	<0.01	<0.01	0.00	No Limit
		EP231X-INJ: Sum of PFAS (WA DER List)	----	0.01	µg/L	<0.01	<0.01	0.00	No Limit



Method Blank (MB) and Laboratory Control Spike (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 Spike (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: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report				
				Result	Spike Concentration	Spike Recovery (%)		Recovery Limits (%)	
						LCS	Low	High	
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 3337641)									
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	0.0011 mg/kg	86.4	72.0	128	
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	0.00117 mg/kg	100	73.0	123	
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	0.00118 mg/kg	81.8	67.0	130	
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	0.00119 mg/kg	99.2	70.0	132	
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	0.00116 mg/kg	84.5	68.0	136	
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	0.0012 mg/kg	86.7	59.0	134	
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 3337641)									
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	0.00625 mg/kg	87.0	71.0	135	
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	0.00125 mg/kg	87.6	69.0	132	
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	0.00125 mg/kg	88.0	70.0	132	
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	0.00125 mg/kg	86.0	71.0	131	
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	91.6	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	85.2	69.0	133	
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	88.4	64.0	136	
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	80.0	69.0	135	
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	78.4	66.0	139	
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	0.00312 mg/kg	84.1	69.0	133	
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 3337641)									
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	83.3	62.8	140	
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	0.00312 mg/kg	97.6	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	137	
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	88.0	61.0	139	
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 3337641)									
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	0.00117 mg/kg	90.2	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	113	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	95.4	65.0	137	



Sub-Matrix: **SOIL**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report Result	Laboratory Control Spike (LCS) Report				
					Spike Concentration	Spike Recovery (%)		Recovery Limits (%)	
						LCS	Low	High	
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 3337641) - continued									
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	0.0012 mg/kg	97.5	54.8	124	

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report Result	Laboratory Control Spike (LCS) Report				
					Spike Concentration	Spike Recovery (%)		Recovery Limits (%)	
						LCS	Low	High	
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 3337841)									
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.2218 µg/L	85.7	72.0	130	
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.2352 µg/L	86.3	71.0	127	
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.02	µg/L	<0.02	0.2373 µg/L	80.5	68.0	131	
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.238 µg/L	89.3	69.0	134	
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.232 µg/L	83.4	65.0	140	
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.241 µg/L	84.8	53.0	142	
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 3340842)									
EP231X-INJ: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.444 µg/L	93.9	72.0	130	
EP231X-INJ: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.47 µg/L	96.2	71.0	127	
EP231X-INJ: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.02	µg/L	<0.02	0.475 µg/L	96.4	68.0	131	
EP231X-INJ: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.477 µg/L	100	69.0	134	
EP231X-INJ: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.4646 µg/L	93.6	65.0	140	
EP231X-INJ: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.5 µg/L	84.2	53.0	142	
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 3337841)									
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	1.25 µg/L	82.0	73.0	129	
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	0.25 µg/L	87.2	72.0	129	
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	0.25 µg/L	85.2	72.0	129	
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	0.25 µg/L	85.8	72.0	130	
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	0.25 µg/L	79.8	71.0	133	
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	0.25 µg/L	85.2	69.0	130	
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	0.25 µg/L	82.8	71.0	129	
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	0.25 µg/L	87.0	69.0	133	
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	0.25 µg/L	77.4	72.0	134	
EP231X: Perfluorotridecanoic acid (PFTTrDA)	72629-94-8	0.02	µg/L	<0.02	0.25 µg/L	88.6	65.0	144	
EP231X: Perfluorotetradecanoic acid (PFTTeDA)	376-06-7	0.05	µg/L	<0.05	0.625 µg/L	79.1	71.0	132	
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 3340842)									
EP231X-INJ: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.10	2.5 µg/L	91.3	73.0	129	
EP231X-INJ: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	0.5 µg/L	91.8	72.0	129	
EP231X-INJ: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	0.5 µg/L	89.8	72.0	129	
EP231X-INJ: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	0.5 µg/L	91.0	72.0	130	
EP231X-INJ: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	0.5 µg/L	93.0	71.0	133	
EP231X-INJ: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	0.5 µg/L	91.2	69.0	130	
EP231X-INJ: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	0.5 µg/L	104	71.0	129	



Sub-Matrix: WATER

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report				
				Result	Spike Concentration	Spike Recovery (%)		Recovery Limits (%)	
						LCS	Low	High	
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 3340842) - continued									
EP231X-INJ: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	0.5 µg/L	93.0	69.0	133	
EP231X-INJ: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	0.5 µg/L	95.8	72.0	134	
EP231X-INJ: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	0.5 µg/L	88.6	65.0	144	
EP231X-INJ: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	1.25 µg/L	93.9	71.0	132	
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 3337841)									
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.25 µg/L	91.0	67.0	137	
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	0.625 µg/L	86.8	68.0	141	
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	0.625 µg/L	69.1	60.5	138	
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	0.625 µg/L	83.4	68.3	134	
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	0.625 µg/L	90.0	62.6	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	81.8	61.0	135	
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 3340842)									
EP231X-INJ: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.5 µg/L	94.0	67.0	137	
EP231X-INJ: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	1.25 µg/L	105	68.0	141	
EP231X-INJ: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	1.25 µg/L	88.6	62.1	136	
EP231X-INJ: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	1.25 µg/L	79.8	65.2	135	
EP231X-INJ: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	1.25 µg/L	97.4	63.2	135	
EP231X-INJ: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	0.5 µg/L	77.8	65.0	136	
EP231X-INJ: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	0.5 µg/L	92.8	61.0	135	
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 3337841)									
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.2343 µg/L	89.2	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	94.6	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	82.1	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	82.0	64.2	133	
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 3340842)									
EP231X-INJ: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.469 µg/L	95.9	63.0	143	
EP231X-INJ: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	0.476 µg/L	99.6	64.0	140	
EP231X-INJ: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	0.48 µg/L	91.0	67.0	138	
EP231X-INJ: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	0.483 µg/L	94.2	62.2	139	



Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report Result	Laboratory Control Spike (LCS) Report			
					Spike Concentration	Spike Recovery (%)	Recovery Limits (%)	
						LCS	Low	High
EP231P: PFAS Sums (QCLot: 3337841)								
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: 3340842)								
EP231X-INJ: Sum of PFAS	----	0.01	µg/L	<0.01	----	----	----	----
EP231X-INJ: Sum of PFHxS and PFOS	355-46-4/17 63-23-1	0.01	µg/L	<0.01	----	----	----	----
EP231X-INJ: 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: **SOIL**

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report					
				Spike Concentration	Spike Recovery (%) MS	Recovery Limits (%)			
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 3337641)									
ET2004260-008	0229_SD113_201028	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.00117 mg/kg	85.4	72.0	128		
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.00117 mg/kg	102	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	110	70.0	132		
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.00116 mg/kg	112	68.0	136		
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0012 mg/kg	61.7	59.0	134		
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 3337641)									
ET2004260-008	0229_SD113_201028	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.00625 mg/kg	121	71.0	135		
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.00125 mg/kg	103	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	80.0	71.0	131		
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.00125 mg/kg	90.8	69.0	133		
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.00125 mg/kg	91.6	72.0	129		
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.00125 mg/kg	73.6	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	96.4	69.0	135		
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.00125 mg/kg	98.4	66.0	139		
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.00312 mg/kg	100	69.0	133		
		EP231C: Perfluoroalkyl Sulfonamides (QCLot: 3337641)							
		ET2004260-008	0229_SD113_201028	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.00125 mg/kg	96.8	48.0	128



Sub-Matrix: **SOIL**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Recovery Limits (%)	
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 3337641) - continued							
ET2004260-008	0229_SD113_201028	EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.00312 mg/kg	109	70.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.00312 mg/kg	110	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.00312 mg/kg	98.7	70.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.00312 mg/kg	73.7	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.00125 mg/kg	112	63.0	144
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.00125 mg/kg	84.0	61.0	139
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 3337641)							
ET2004260-008	0229_SD113_201028	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.00117 mg/kg	90.6	62.0	145
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.00118 mg/kg	89.4	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0012 mg/kg	82.1	65.0	137
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0012 mg/kg	# 59.2	70.0	130

Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Recovery Limits (%)	
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 3337841)							
ET2004260-012	0229_MW072_201028	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.2218 µg/L	92.9	72.0	130
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.235 µg/L	103	71.0	127
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.2352 µg/L	108	68.0	131
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.238 µg/L	117	69.0	134
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.232 µg/L	108	65.0	140
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.241 µg/L	95.6	53.0	142
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 3340842)							
EB2028561-014	Anonymous	EP231X-INJ: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.443 µg/L	98.9	70.0	130
		EP231X-INJ: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.47 µg/L	98.7	70.0	130
		EP231X-INJ: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.475 µg/L	97.9	70.0	130
		EP231X-INJ: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.477 µg/L	104	70.0	130
		EP231X-INJ: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.5 µg/L	80.8	70.0	130
		EP231X-INJ: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.482 µg/L	91.3	70.0	130
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 3337841)							
ET2004260-012	0229_MW072_201028	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	1.25 µg/L	88.1	73.0	129
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.25 µg/L	96.0	72.0	129
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.25 µg/L	87.6	72.0	129
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.25 µg/L	99.6	72.0	130



Sub-Matrix: WATER

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report			
				Spike Concentration	SpikeRecovery(%) MS	Recovery Limits (%)	
				Low	High		
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 3337841) - continued							
ET2004260-012	0229_MW072_201028	EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.25 µg/L	90.2	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	96.4	71.0	129
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.25 µg/L	89.4	69.0	133
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.25 µg/L	81.8	72.0	134
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.25 µg/L	89.2	65.0	144
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.625 µg/L	87.4	71.0	132
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 3340842)							
EB2028561-014	Anonymous	EP231X-INJ: Perfluorobutanoic acid (PFBA)	375-22-4	2.5 µg/L	109	70.0	130
		EP231X-INJ: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.5 µg/L	98.6	70.0	130
		EP231X-INJ: Perfluorohexanoic acid (PFHxA)	307-24-4	0.5 µg/L	99.2	70.0	130
		EP231X-INJ: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.5 µg/L	93.4	70.0	130
		EP231X-INJ: Perfluorooctanoic acid (PFOA)	335-67-1	0.5 µg/L	97.2	70.0	130
		EP231X-INJ: Perfluorononanoic acid (PFNA)	375-95-1	0.5 µg/L	94.6	70.0	130
		EP231X-INJ: Perfluorodecanoic acid (PFDA)	335-76-2	0.5 µg/L	103	70.0	130
		EP231X-INJ: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.5 µg/L	101	70.0	130
		EP231X-INJ: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.5 µg/L	103	70.0	130
		EP231X-INJ: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.5 µg/L	98.2	70.0	130
		EP231X-INJ: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	1.25 µg/L	100	70.0	130
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 3337841)							
ET2004260-012	0229_MW072_201028	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	104	70.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.625 µg/L	79.3	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.625 µg/L	94.9	70.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.625 µg/L	95.5	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.25 µg/L	87.6	65.0	136
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.25 µg/L	86.0	61.0	135
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 3340842)							
EB2028561-014	Anonymous	EP231X-INJ: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.5 µg/L	94.6	70.0	130
		EP231X-INJ: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	1.25 µg/L	110	70.0	130
		EP231X-INJ: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	1.25 µg/L	90.9	70.0	130



Sub-Matrix: WATER

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Recovery Limits (%)	
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 3340842) - continued							
EB2028561-014	Anonymous	EP231X-INJ: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	1.25 µg/L	84.7	70.0	130
		EP231X-INJ: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	1.25 µg/L	102	70.0	130
		EP231X-INJ: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.5 µg/L	84.0	70.0	130
		EP231X-INJ: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.5 µg/L	103	70.0	130
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 3337841)							
ET2004260-012	0229_MW072_201028	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.234 µg/L	100	63.0	143
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.2378 µg/L	102	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	118	70.0	130
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 3340842)							
EB2028561-014	Anonymous	EP231X-INJ: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.468 µg/L	103	70.0	130
		EP231X-INJ: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.475 µg/L	105	70.0	130
		EP231X-INJ: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.48 µg/L	106	70.0	130
		EP231X-INJ: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.483 µg/L	120	70.0	130

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: ET2004260	Page	: 1 of 6
Amendment	: 2		
Client	: AECOM Australia Pty Ltd	Laboratory	: Environmental Division Townsville
Contact	: [REDACTED]	Telephone	: [REDACTED]
Project	: QLD_0229_PFASOMP_20	Date Samples Received	: 28-Oct-2020
Site	: QLD_0229	Issue Date	: 19-Nov-2020
Sampler	: [REDACTED]	No. of samples received	: 26
Order number	: 60621487 task 3.1	No. of samples analysed	: 26

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							
EP231D: (n:2) Fluorotelomer Sulfonic Acids	ET2004260--008	0229_SD113_201028	10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	59.2 %	70.0-130%	Recovery less than lower 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: **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) 0229_SD136_201028, 0229_SD135_201028,	0229_SD113_201028, 0229_SD120_201028	28-Oct-2020	----	----	----	30-Oct-2020	11-Nov-2020	✓
EP231A: Perfluoroalkyl Sulfonic Acids								
HDPE Soil Jar (EP231X) 0229_SD136_201028, 0229_SD135_201028,	0229_SD113_201028, 0229_SD120_201028	28-Oct-2020	30-Oct-2020	26-Apr-2021	✓	30-Oct-2020	09-Dec-2020	✓
EP231B: Perfluoroalkyl Carboxylic Acids								
HDPE Soil Jar (EP231X) 0229_SD136_201028, 0229_SD135_201028,	0229_SD113_201028, 0229_SD120_201028	28-Oct-2020	30-Oct-2020	26-Apr-2021	✓	30-Oct-2020	09-Dec-2020	✓
EP231C: Perfluoroalkyl Sulfonamides								
HDPE Soil Jar (EP231X) 0229_SD136_201028, 0229_SD135_201028,	0229_SD113_201028, 0229_SD120_201028	28-Oct-2020	30-Oct-2020	26-Apr-2021	✓	30-Oct-2020	09-Dec-2020	✓
EP231D: (n:2) Fluorotelomer Sulfonic Acids								
HDPE Soil Jar (EP231X) 0229_SD136_201028, 0229_SD135_201028,	0229_SD113_201028, 0229_SD120_201028	28-Oct-2020	30-Oct-2020	26-Apr-2021	✓	30-Oct-2020	09-Dec-2020	✓
EP231P: PFAS Sums								
HDPE Soil Jar (EP231X) 0229_SD136_201028, 0229_SD135_201028,	0229_SD113_201028, 0229_SD120_201028	28-Oct-2020	30-Oct-2020	26-Apr-2021	✓	30-Oct-2020	09-Dec-2020	✓



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-INJ) 0229_MW131_201028, 0229_QC100_201028,	0229_MW135_201028, 0229_MW115_201028	28-Oct-2020	03-Nov-2020	26-Apr-2021	✓	03-Nov-2020	26-Apr-2021	✓
HDPE (no PTFE) (EP231X) 0229_MW119_201028, 0229_MW117_D_201028, 0229_MW141_201028, 0229_MW106_201028, 0229_MW072_201028, 0229_MW002_201028, 0229_MW018_201028, 0229_MW114_201028, 0229_MW123_I_201028,	0229_MW118_201028, 0229_MW117_S_201028, 0229_SW113_201028, 0229_MW074_201028, 0229_MW116_201028, 0229_SW135_201028, 0229_QC101_201028, 0229_QC300_201028, 0229_MW139_201028	28-Oct-2020	30-Oct-2020	26-Apr-2021	✓	30-Oct-2020	26-Apr-2021	✓
EP231B: Perfluoroalkyl Carboxylic Acids								
HDPE (no PTFE) (EP231X-INJ) 0229_MW131_201028, 0229_QC100_201028,	0229_MW135_201028, 0229_MW115_201028	28-Oct-2020	03-Nov-2020	26-Apr-2021	✓	03-Nov-2020	26-Apr-2021	✓
HDPE (no PTFE) (EP231X) 0229_MW119_201028, 0229_MW117_D_201028, 0229_MW141_201028, 0229_MW106_201028, 0229_MW072_201028, 0229_MW002_201028, 0229_MW018_201028, 0229_MW114_201028, 0229_MW123_I_201028,	0229_MW118_201028, 0229_MW117_S_201028, 0229_SW113_201028, 0229_MW074_201028, 0229_MW116_201028, 0229_SW135_201028, 0229_QC101_201028, 0229_QC300_201028, 0229_MW139_201028	28-Oct-2020	30-Oct-2020	26-Apr-2021	✓	30-Oct-2020	26-Apr-2021	✓
EP231C: Perfluoroalkyl Sulfonamides								
HDPE (no PTFE) (EP231X-INJ) 0229_MW131_201028, 0229_QC100_201028,	0229_MW135_201028, 0229_MW115_201028	28-Oct-2020	03-Nov-2020	26-Apr-2021	✓	03-Nov-2020	26-Apr-2021	✓
HDPE (no PTFE) (EP231X) 0229_MW119_201028, 0229_MW117_D_201028, 0229_MW141_201028, 0229_MW106_201028, 0229_MW072_201028, 0229_MW002_201028, 0229_MW018_201028, 0229_MW114_201028, 0229_MW123_I_201028,	0229_MW118_201028, 0229_MW117_S_201028, 0229_SW113_201028, 0229_MW074_201028, 0229_MW116_201028, 0229_SW135_201028, 0229_QC101_201028, 0229_QC300_201028, 0229_MW139_201028	28-Oct-2020	30-Oct-2020	26-Apr-2021	✓	30-Oct-2020	26-Apr-2021	✓



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-INJ) 0229_MW131_201028, 0229_QC100_201028,	0229_MW135_201028, 0229_MW115_201028	28-Oct-2020	03-Nov-2020	26-Apr-2021	✓	03-Nov-2020	26-Apr-2021	✓
HDPE (no PTFE) (EP231X) 0229_MW119_201028, 0229_MW117_D_201028, 0229_MW141_201028, 0229_MW106_201028, 0229_MW072_201028, 0229_MW002_201028, 0229_MW018_201028, 0229_MW114_201028, 0229_MW123_I_201028,	0229_MW118_201028, 0229_MW117_S_201028, 0229_SW113_201028, 0229_MW074_201028, 0229_MW116_201028, 0229_SW135_201028, 0229_QC101_201028, 0229_QC300_201028, 0229_MW139_201028	28-Oct-2020	30-Oct-2020	26-Apr-2021	✓	30-Oct-2020	26-Apr-2021	✓
EP231P: PFAS Sums								
HDPE (no PTFE) (EP231X-INJ) 0229_MW131_201028, 0229_QC100_201028,	0229_MW135_201028, 0229_MW115_201028	28-Oct-2020	03-Nov-2020	26-Apr-2021	✓	03-Nov-2020	26-Apr-2021	✓
HDPE (no PTFE) (EP231X) 0229_MW119_201028, 0229_MW117_D_201028, 0229_MW141_201028, 0229_MW106_201028, 0229_MW072_201028, 0229_MW002_201028, 0229_MW018_201028, 0229_MW114_201028, 0229_MW123_I_201028,	0229_MW118_201028, 0229_MW117_S_201028, 0229_SW113_201028, 0229_MW074_201028, 0229_MW116_201028, 0229_SW135_201028, 0229_QC101_201028, 0229_QC300_201028, 0229_MW139_201028	28-Oct-2020	30-Oct-2020	26-Apr-2021	✓	30-Oct-2020	26-Apr-2021	✓



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	Method	Count		Rate (%)			Quality Control Specification
		QC	Regular	Actual	Expected	Evaluation	
Analytical Methods							
Laboratory Duplicates (DUP)							
Moisture Content	EA055	1	7	14.29	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	4	25.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	4	25.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	4	25.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	4	25.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard

Matrix: WATER

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

Quality Control Sample Type	Method	Count		Rate (%)			Quality Control Specification
		QC	Regular	Actual	Expected	Evaluation	
Analytical Methods							
Laboratory Duplicates (DUP)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	18	11.11	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X-INJ	1	7	14.29	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
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X-INJ	1	7	14.29	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
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X-INJ	1	7	14.29	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
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X-INJ	1	7	14.29	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.
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.
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X-INJ	WATER	In house: Direct injection analysis of fresh waters after dilution (1:1) with mobile phase solvent. Analysis by LC-Electrospray-MS-MS, Negative Mode using MRM. Where commercially available, isotopically labelled analogues of the target analytes are used as internal standards for quantification. Where a labelled analogue is not commercially available, the internal standard with similar chemistry and the closest retention time to the target is used for quantification. 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.

Preparation Methods	Method	Matrix	Method Descriptions
Sample Extraction for PFAS in solid matrices	ORG73	SOIL	In-house: 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 conform to US DoD QSM 5.3, table B-15 requirements.
Preparation for PFAS in water.	EP231-PR	WATER	Method presumes direct injection without workup. Preparation includes addition of internal standard and surrogate, and filtration prior to analysis.
Solid Phase Extraction (SPE) for PFAS in water	ORG72	WATER	In-house: Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to the sample container. The entire contents are transferred to a solid phase extraction (SPE) cartridge. The sample container is successively rinsed with aliquots of the elution solvent. The eluted extract is combined with an equal volume of reagent water and a portion is filtered for analysis. Method procedures conform to US DoD QSM 5.3, table B-15 requirements.



SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : ET2004260

Client	: AECOM Australia Pty Ltd	Laboratory	: Environmental Division Townsville
Contact	: [REDACTED]	Contact	: [REDACTED]
Address	: [REDACTED]	Address	: [REDACTED] QLD Australia 4814
E-mail	: [REDACTED]	E-mail	: [REDACTED]
Telephone	: ----	Telephone	: [REDACTED]
Facsimile	: ----	Facsimile	:
Project	: QLD_0229_PFASOMP_20	Page	: 1 of 3
Order number	: 60612487_2.2	Quote number	: ET2020AECOMAU0001 (TV/123/20)
C-O-C number	: 15322	QC Level	: NEPM 2013 B3 & ALS QC Standard
Site	: QLD_0229		
Sampler	: [REDACTED]		

Dates

Date Samples Received	: 28-Oct-2020 17:15	Issue Date	: 29-Oct-2020
Client Requested Due Date	: 05-Nov-2020	Scheduled Reporting Date	: 05-Nov-2020

Delivery Details

Mode of Delivery	: Client Drop Off	Security Seal	: Not Available
No. of coolers/boxes	: 1	Temperature	: 5.6°C - Ice present
Receipt Detail	: ESKY	No. of samples received / analysed	: 26 / 26

General Comments

- This report contains the following information:
 - Sample Container(s)/Preservation Non-Compliances
 - Summary of Sample(s) and Requested Analysis
 - Proactive Holding Time Report
 - Requested Deliverables
- **Please be advised that sample #20 was logged in Compass as water matrix but has been confirmed as soil by the client and was logged as soil.**
- Discounted Package Prices apply only when specific ALS Group Codes ('W', 'S', 'NT' suites) are referenced on COCs.
- Please direct any turn around / technical queries to the laboratory contact designated above.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months ± 1 week) from receipt of samples.
- All analysis will be conducted by ALS Environmental, Brisbane, NATA accreditation no. 825, Site No. 818.
- 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	Client sampling date / time	Client sample ID	SOIL - EA055-103 Moisture Content	SOIL - EP231X (solids) PFAS - Full Suite (28 analytes)
ET2004260-001	28-Oct-2020 08:25	0229_SD136_201028	✓	✓
ET2004260-008	28-Oct-2020 11:29	0229_SD113_201028	✓	✓
ET2004260-018	28-Oct-2020 15:00	0229_SD135_201028	✓	✓
ET2004260-020	28-Oct-2020 15:20	0229_SD120_201028	✓	✓

Matrix: **WATER**

Laboratory sample ID	Client sampling date / time	Client sample ID	WATER - EP231X PFAS - Full Suite (28 analytes)
ET2004260-002	28-Oct-2020 09:17	0229_MW119_201028	✓
ET2004260-003	28-Oct-2020 09:43	0229_MW118_201028	✓
ET2004260-004	28-Oct-2020 10:16	0229_MW117_D_201028	✓
ET2004260-005	28-Oct-2020 10:16	0229_MW117_S_201028	✓
ET2004260-006	28-Oct-2020 10:57	0229_MW141_201028	✓
ET2004260-007	28-Oct-2020 11:28	0229_SW113_201028	✓
ET2004260-009	28-Oct-2020 11:20	0229_MW106_201028	✓
ET2004260-010	28-Oct-2020 11:57	0229_MW074_201028	✓
ET2004260-011	28-Oct-2020 12:41	0229_MW131_201028	✓
ET2004260-012	28-Oct-2020 12:42	0229_MW072_201028	✓
ET2004260-013	28-Oct-2020 13:37	0229_MW135_201028	✓
ET2004260-014	28-Oct-2020 13:38	0229_QC100_201028	✓
ET2004260-015	28-Oct-2020 14:14	0229_MW116_201028	✓
ET2004260-016	28-Oct-2020 14:50	0229_MW115_201028	✓
ET2004260-017	28-Oct-2020 14:58	0229_MW002_201028	✓
ET2004260-019	28-Oct-2020 15:02	0229_SW135_201028	✓
ET2004260-021	28-Oct-2020 15:48	0229_MW018_201028	✓
ET2004260-022	28-Oct-2020 15:49	0229_QC102_201028	✓
ET2004260-023	28-Oct-2020 16:05	0229_MW114_201028	✓



WATER - EP231X
PFAS - Full Suite (28 analytes)

ET2004260-024	28-Oct-2020 16:07	0229_QC300_201028	✓
ET2004260-025	28-Oct-2020 16:49	0229_MW123_I_201028	✓
ET2004260-026	28-Oct-2020 16:23	0229_MW139_201028	✓

Proactive Holding Time Report

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

Requested Deliverables

ACCOUNTS PAYABLE

- A4 - AU Tax Invoice (INV)

Email

[REDACTED]

[REDACTED]

- *AU Certificate of Analysis - NATA (COA)
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)
- A4 - AU Tax Invoice (INV)
- Chain of Custody (CoC) (COC)
- EDI Format - ENMRG (ENMRG)
- EDI Format - ESDAT (ESDAT)

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- EDI Format - ESDAT (ESDAT)

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

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- *AU Certificate of Analysis - NATA (COA)
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)
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CERTIFICATE OF ANALYSIS

Work Order : ET2004277-AB
Amendment : 1
Client : AECOM Australia Pty Ltd
Contact : [Redacted]
Address : [Redacted]
Telephone : ----
Project : QLD_0229_PFASOMP_20
Order number : 60612487_3.1
C-O-C number : 15323
Sampler : [Redacted]
Site : QLD_0229
Quote number : TV/123/20
No. of samples received : 36
No. of samples analysed : 36

Page : 1 of 23
Laboratory : Environmental Division Townsville
Contact : [Redacted]
Address : [Redacted]
Telephone : [Redacted]
Date Samples Received : 29-Oct-2020 17:05
Date Analysis Commenced : 03-Nov-2020
Issue Date : 17-Nov-2020 11:23



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. 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.

Table with 3 columns: Signatories, Position, Accreditation Category. Contains redacted information.



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 Contact for details.

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

- EP231X - Per- and Polyfluoroalkyl Substances (PFAS): Samples received in 20ml or 125ml bottles have been tested in accordance with the QSM5.3 compliant, NATA accredited method. 60mL or 250mL bottles have been tested to the legacy QSM 5.1 aligned, NATA accredited method.
- EP231X PFAS: Particular samples required dilution due to the presence of high level contaminants and matrix interferences. LOR values have been adjusted accordingly. Matrix spike and particular surrogate recoveries not determined.
- Amendment (17/11/2020): This report has been amended following the separation of sample "0229_MW226_201029" to a separate COA as per client request from [REDACTED]. All analysis results are as per the previous report.
- EP231X PFAS: The LOR of PFBA for sample "0229_SW119_201029" and "0229_SW121_201029" has been raised due to sample matrix interferences.
- EP231X PFAS: The LOR of PFDS for sample "0229_SD109_201029" has been raised due to sample matrix interferences.
- All analysis will be conducted by ALS Environmental, Brisbane, NATA accreditation no. 825, Site No. 818.
- 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.
- 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)				Client sample ID	0229_MW065_201029	0229_MW101_201029	0229_MW120_201029	----	----
Client sampling date / time				29-Oct-2020 10:31	29-Oct-2020 12:06	29-Oct-2020 13:00	----	----	
Compound	CAS Number	LOR	Unit	ET2004277-013	ET2004277-019	ET2004277-020	-----	-----	
				Result	Result	Result	----	----	
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	0.36	0.20	0.10	----	----	
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	0.45	0.10	<0.02	----	----	
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.02	µg/L	7.17	0.80	0.13	----	----	
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	0.27	0.04	<0.02	----	----	
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	8.23	1.27	0.14	----	----	
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.03	<0.02	<0.02	----	----	
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.2	<0.1	<0.1	----	----	
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	0.20	0.03	<0.02	----	----	
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	1.47	0.13	<0.02	----	----	
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	0.09	0.02	<0.02	----	----	
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	0.18	0.04	<0.01	----	----	
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	<0.03	<0.02	<0.02	----	----	
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.03	<0.02	<0.02	----	----	
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.03	<0.02	<0.02	----	----	
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.03	<0.02	<0.02	----	----	
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.09	<0.05	<0.05	----	----	
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.03	<0.02	<0.02	----	----	
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.09	<0.05	<0.05	----	----	
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.09	<0.05	<0.05	----	----	



Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Client sample ID	0229_MW065_201029	0229_MW101_201029	0229_MW120_201029	----	----
Client sampling date / time				29-Oct-2020 10:31	29-Oct-2020 12:06	29-Oct-2020 13:00	----	----	
Compound	CAS Number	LOR	Unit	ET2004277-013	ET2004277-019	ET2004277-020	-----	-----	
				Result	Result	Result	----	----	
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.09	<0.05	<0.05	----	----	
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.09	<0.05	<0.05	----	----	
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.03	<0.02	<0.02	----	----	
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.03	<0.02	<0.02	----	----	
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	<0.05	<0.05	----	----	
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	<0.05	<0.05	----	----	
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	<0.05	<0.05	----	----	
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	<0.05	<0.05	----	----	
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L	18.4	2.63	0.37	----	----	
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	15.4	2.07	0.27	----	----	
Sum of PFAS (WA DER List)	----	0.01	µg/L	17.7	2.49	0.37	----	----	
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%	73.0	105	94.6	----	----	
13C8-PFOA	----	0.02	%	84.0	101	97.2	----	----	



Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)				Client sample ID	0229_SD109_201029	0229_SD119_201029	0229_SD137_201029	0229_SD134_201029	0229_SD132_201029
Client sampling date / time					29-Oct-2020 09:43	29-Oct-2020 13:45	29-Oct-2020 14:13	29-Oct-2020 15:25	29-Oct-2020 15:43
Compound	CAS Number	LOR	Unit	ET2004277-011	ET2004277-023	ET2004277-024	ET2004277-030	ET2004277-032	ET2004277-032
				Result	Result	Result	Result	Result	Result
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content	----	0.1	%	26.8	50.3	21.6	43.3	25.5	
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	0.0010	0.0027	<0.0002	<0.0002	<0.0002	
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	0.0009	0.0032	<0.0002	<0.0002	<0.0002	
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	0.0067	0.0211	<0.0002	<0.0002	0.0008	
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	0.0007	0.0006	<0.0002	<0.0002	<0.0002	
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	0.0307	0.0122	0.0003	0.0003	0.0031	
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0004	<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	0.0005	0.0008	<0.0002	<0.0002	<0.0002	
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	0.0020	0.0046	<0.0002	<0.0002	<0.0002	
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	0.0003	0.0006	<0.0002	<0.0002	<0.0002	
Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	0.0007	0.0011	<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	
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	



Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)				Client sample ID	0229_SD109_201029	0229_SD119_201029	0229_SD137_201029	0229_SD134_201029	0229_SD132_201029
Client sampling date / time					29-Oct-2020 09:43	29-Oct-2020 13:45	29-Oct-2020 14:13	29-Oct-2020 15:25	29-Oct-2020 15:43
Compound	CAS Number	LOR	Unit	ET2004277-011	ET2004277-023	ET2004277-024	ET2004277-030	ET2004277-032	
				Result	Result	Result	Result	Result	
EP231C: Perfluoroalkyl Sulfonamides - Continued									
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	0.0435	0.0469	0.0003	0.0003	0.0039	
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg	0.0374	0.0333	0.0003	0.0003	0.0039	
Sum of PFAS (WA DER List)	----	0.0002	mg/kg	0.0419	0.0431	0.0003	0.0003	0.0039	
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.0002	%	85.0	129	96.5	108	107	
13C8-PFOA	----	0.0002	%	89.5	122	94.0	107	97.0	



Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)				Client sample ID	0229_SD129_201029	0229_SD128_201029	0229_SD126_201029	----	----
Client sampling date / time				29-Oct-2020 16:07	29-Oct-2020 16:11	29-Oct-2020 16:33	----	----	
Compound	CAS Number	LOR	Unit	ET2004277-034	ET2004277-035	ET2004277-036	-----	-----	
				Result	Result	Result	----	----	
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content	----	0.1	%	0.3	9.5	16.3	----	----	
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	0.0005	0.0010	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	----	----	
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	----	----	



Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)				Client sample ID	0229_SD129_201029	0229_SD128_201029	0229_SD126_201029	----	----
Client sampling date / time				29-Oct-2020 16:07	29-Oct-2020 16:11	29-Oct-2020 16:33	----	----	
Compound	CAS Number	LOR	Unit	ET2004277-034	ET2004277-035	ET2004277-036	-----	-----	
				Result	Result	Result	----	----	
EP231C: Perfluoroalkyl Sulfonamides - Continued									
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	0.0005	0.0010	0.0003	----	----	
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg	0.0005	0.0010	0.0003	----	----	
Sum of PFAS (WA DER List)	----	0.0002	mg/kg	0.0005	0.0010	0.0003	----	----	
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.0002	%	84.5	97.5	106	----	----	
13C8-PFOA	----	0.0002	%	99.0	102	97.5	----	----	



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	0229_SD139_201029	0229_QC103_201029	0229_SD110_201029	0229_SD140_201029	0229_QC105_201029
Client sampling date / time					29-Oct-2020 08:40	29-Oct-2020 08:41	29-Oct-2020 09:22	29-Oct-2020 11:28	29-Oct-2020 14:14
Compound	CAS Number	LOR	Unit	ET2004277-004	ET2004277-005	ET2004277-010	ET2004277-017	ET2004277-025	
				Result	Result	Result	Result	Result	
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content	----	0.1	%	51.8	45.9	15.2	49.6	22.3	
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0010	<0.0005	0.0081	<0.0002	<0.0002	
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0010	<0.0005	0.0064	0.0002	<0.0002	
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	0.0024	0.0023	0.0319	0.0024	<0.0002	
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0010	<0.0005	<0.0005	0.0002	<0.0002	
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	0.0227	0.0181	0.0098	0.0216	0.0003	
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0010	<0.0005	<0.0005	0.0003	<0.0002	
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.005	<0.002	<0.002	<0.001	<0.001	
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0010	<0.0005	0.0033	<0.0002	<0.0002	
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0010	<0.0005	0.0131	0.0003	<0.0002	
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0010	<0.0005	0.0018	<0.0002	<0.0002	
Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0010	<0.0005	0.0012	<0.0002	<0.0002	
Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0010	<0.0005	<0.0005	<0.0002	<0.0002	
Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0010	<0.0005	<0.0005	<0.0002	<0.0002	
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0010	<0.0005	<0.0005	<0.0002	<0.0002	
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0010	<0.0005	<0.0005	<0.0002	<0.0002	
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0010	<0.0005	<0.0005	<0.0002	<0.0002	
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0025	<0.0012	<0.0012	<0.0005	<0.0005	
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0010	<0.0005	<0.0005	<0.0002	<0.0002	
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0025	<0.0012	<0.0012	<0.0005	<0.0005	



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	0229_SD139_201029	0229_QC103_201029	0229_SD110_201029	0229_SD140_201029	0229_QC105_201029
Client sampling date / time					29-Oct-2020 08:40	29-Oct-2020 08:41	29-Oct-2020 09:22	29-Oct-2020 11:28	29-Oct-2020 14:14
Compound	CAS Number	LOR	Unit	ET2004277-004	ET2004277-005	ET2004277-010	ET2004277-017	ET2004277-025	
				Result	Result	Result	Result	Result	
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0025	<0.0012	<0.0012	<0.0005	<0.0005	
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0025	<0.0012	<0.0012	<0.0005	<0.0005	
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0025	<0.0012	<0.0012	<0.0005	<0.0005	
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0010	<0.0005	<0.0005	<0.0002	<0.0002	
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0010	<0.0005	<0.0005	<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	<0.0010	<0.0005	<0.0005	<0.0005	<0.0005	
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0010	<0.0005	<0.0005	<0.0005	<0.0005	
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0010	<0.0005	<0.0005	<0.0005	<0.0005	
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0010	<0.0005	<0.0005	<0.0005	<0.0005	
EP231P: PFAS Sums									
Sum of PFAS	----	0.0002	mg/kg	0.0251	0.0204	0.0756	0.0250	0.0003	
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg	0.0251	0.0204	0.0417	0.0240	0.0003	
Sum of PFAS (WA DER List)	----	0.0002	mg/kg	0.0251	0.0204	0.0692	0.0243	0.0003	
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.0002	%	105	80.0	80.0	98.5	108	
13C8-PFOA	----	0.0002	%	85.0	90.0	80.0	97.5	97.5	



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	0229_SD121_201029	0229_SD133_201029	0229_SD130_201029	----	----
Client sampling date / time				29-Oct-2020 14:46	29-Oct-2020 15:17	29-Oct-2020 15:57	----	----	
Compound	CAS Number	LOR	Unit	ET2004277-027	ET2004277-028	ET2004277-033	-----	-----	
				Result	Result	Result	----	----	
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content	----	0.1	%	71.2	8.6	17.9	----	----	
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	0.0008	<0.0002	<0.0005	----	----	
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	0.0008	<0.0002	<0.0005	----	----	
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	0.0104	<0.0002	<0.0005	----	----	
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	0.0007	<0.0002	<0.0005	----	----	
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	0.0461	0.0007	0.0021	----	----	
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	<0.0002	<0.0005	----	----	
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	<0.001	<0.002	----	----	
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	0.0002	<0.0002	<0.0005	----	----	
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	0.0020	<0.0002	<0.0005	----	----	
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	0.0003	<0.0002	<0.0005	----	----	
Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	0.0016	<0.0002	<0.0005	----	----	
Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	0.0042	<0.0002	<0.0005	----	----	
Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	0.0004	<0.0002	<0.0005	----	----	
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	0.0012	<0.0002	<0.0005	----	----	
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	0.0005	<0.0002	<0.0005	----	----	
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	<0.0002	<0.0005	----	----	
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	<0.0005	<0.0012	----	----	
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	<0.0002	<0.0005	----	----	
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	<0.0005	<0.0012	----	----	



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	0229_SD121_201029	0229_SD133_201029	0229_SD130_201029	----	----
Client sampling date / time				29-Oct-2020 14:46	29-Oct-2020 15:17	29-Oct-2020 15:57	----	----	
Compound	CAS Number	LOR	Unit	ET2004277-027	ET2004277-028	ET2004277-033	-----	-----	
				Result	Result	Result	----	----	
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	<0.0005	<0.0012	----	----	
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	<0.0005	<0.0012	----	----	
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	<0.0005	<0.0012	----	----	
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	<0.0002	<0.0005	----	----	
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	<0.0002	<0.0005	----	----	
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	0.0692	0.0007	0.0021	----	----	
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg	0.0565	0.0007	0.0021	----	----	
Sum of PFAS (WA DER List)	----	0.0002	mg/kg	0.0614	0.0007	0.0021	----	----	
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.0002	%	98.0	91.0	80.0	----	----	
13C8-PFOA	----	0.0002	%	100	99.5	80.0	----	----	



Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Client sample ID	0229_SW119_201029	----	----	----	----
Client sampling date / time				29-Oct-2020 13:44	----	----	----	----	
Compound	CAS Number	LOR	Unit	ET2004277-022	-----	-----	-----	-----	
				Result	----	----	----	----	
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	0.39	----	----	----	----	
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	0.32	----	----	----	----	
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.02	µg/L	1.66	----	----	----	----	
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	0.04	----	----	----	----	
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	0.77	----	----	----	----	
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	<0.2	----	----	----	----	
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	0.12	----	----	----	----	
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	0.62	----	----	----	----	
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	0.06	----	----	----	----	
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	0.07	----	----	----	----	
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	----	----	----	----	



Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)		Client sample ID			0229_SW119_201029	----	----	----	----
		Client sampling date / time			29-Oct-2020 13:44	----	----	----	----
Compound	CAS Number	LOR	Unit	ET2004277-022	-----	-----	-----	-----	-----
				Result	----	----	----	----	----
EP231C: Perfluoroalkyl Sulfonamides - Continued									
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	4.05	----	----	----	----	----
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	2.43	----	----	----	----	----
Sum of PFAS (WA DER List)	----	0.01	µg/L	3.69	----	----	----	----	----
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%	98.4	----	----	----	----	----
13C8-PFOA	----	0.02	%	97.0	----	----	----	----	----



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	0229_MW003_201029	0229_MW138_201029	0229_SW139_201029	0229_QC102_201029	0229_MW128_201029
Client sampling date / time				29-Oct-2020 07:56	29-Oct-2020 08:14	29-Oct-2020 08:42	29-Oct-2020 08:43	29-Oct-2020 09:07	
Compound	CAS Number	LOR	Unit	ET2004277-002	ET2004277-003	ET2004277-006	ET2004277-007	ET2004277-008	
				Result	Result	Result	Result	Result	
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.88	0.14	0.14	24.3	
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	1.10	0.14	0.14	28.0	
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.02	µg/L	0.03	6.19	0.84	0.84	248	
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.35	0.04	0.04	21.5	
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	0.06	7.60	0.99	0.98	483	
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.70	
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	0.2	<0.1	<0.1	3.8	
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	0.29	0.05	0.06	10.4	
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	1.46	0.25	0.24	58.8	
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	0.20	0.03	0.03	6.58	
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	0.29	0.04	0.04	17.8	
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	0.04	<0.02	<0.02	17.2	
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.70	
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.70	
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.70	
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.70	
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<1.75	
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.70	
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<1.75	
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<1.75	



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	0229_MW003_201029	0229_MW138_201029	0229_SW139_201029	0229_QC102_201029	0229_MW128_201029
Client sampling date / time					29-Oct-2020 07:56	29-Oct-2020 08:14	29-Oct-2020 08:42	29-Oct-2020 08:43	29-Oct-2020 09:07
Compound	CAS Number	LOR	Unit	ET2004277-002	ET2004277-003	ET2004277-006	ET2004277-007	ET2004277-008	ET2004277-008
				Result	Result	Result	Result	Result	Result
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05	<1.75
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05	<1.75
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02	<0.70
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02	<0.70
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	<0.70
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	<0.70
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	<0.70
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	<0.70
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L	0.09	18.6	2.52	2.51	2.51	919
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	0.09	13.8	1.83	1.82	1.82	731
Sum of PFAS (WA DER List)	----	0.01	µg/L	0.09	17.1	2.34	2.33	2.33	853
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%	101	97.0	99.3	91.8	91.8	Not Determined
13C8-PFOA	----	0.02	%	109	105	107	105	105	Not Determined



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	0229_MW105_201029	0229_MW123_S_2010 29	0229_QC104_201029	0229_MW122_201029	0229_SW140_201029
Client sampling date / time					29-Oct-2020 09:08	29-Oct-2020 10:06	29-Oct-2020 10:33	29-Oct-2020 10:56	29-Oct-2020 11:27
Compound	CAS Number	LOR	Unit	ET2004277-009	ET2004277-012	ET2004277-014	ET2004277-015	ET2004277-016	ET2004277-016
				Result	Result	Result	Result	Result	Result
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	4.52	0.86	0.41	0.13	0.13	0.13
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	5.00	0.76	0.49	0.10	0.12	0.12
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.02	µg/L	37.6	9.96	7.86	0.76	0.89	0.89
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	1.71	0.99	0.31	0.05	0.05	0.05
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	25.8	2.64	9.18	1.89	1.63	1.63
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.07	<0.03	<0.03	<0.02	<0.02	<0.02
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	0.7	0.2	<0.2	<0.1	<0.1	<0.1
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	1.78	0.20	0.22	<0.02	0.05	0.05
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	11.2	1.13	1.56	0.09	0.25	0.25
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	1.02	0.16	0.10	<0.02	0.02	0.02
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	1.65	0.51	0.19	0.05	0.06	0.06
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	0.11	<0.03	<0.03	<0.02	<0.02	<0.02
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.07	<0.03	<0.03	<0.02	<0.02	<0.02
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.07	<0.03	<0.03	<0.02	<0.02	<0.02
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.07	<0.03	<0.03	<0.02	<0.02	<0.02
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.07	<0.03	<0.03	<0.02	<0.02	<0.02
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.17	<0.09	<0.09	<0.05	<0.05	<0.05
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.07	<0.03	<0.03	<0.02	<0.02	<0.02
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.17	<0.09	<0.09	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.17	<0.09	<0.09	<0.05	<0.05	<0.05



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	0229_MW105_201029	0229_MW123_S_2010 29	0229_QC104_201029	0229_MW122_201029	0229_SW140_201029
Client sampling date / time				29-Oct-2020 09:08	29-Oct-2020 10:06	29-Oct-2020 10:33	29-Oct-2020 10:56	29-Oct-2020 11:27	
Compound	CAS Number	LOR	Unit	ET2004277-009	ET2004277-012	ET2004277-014	ET2004277-015	ET2004277-016	
				Result	Result	Result	Result	Result	
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.17	<0.09	<0.09	<0.05	<0.05	
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.17	<0.09	<0.09	<0.05	<0.05	
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.07	<0.03	<0.03	<0.02	<0.02	
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.07	<0.03	<0.03	<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	<0.07	<0.05	<0.05	<0.05	<0.05	
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	0.24	<0.05	<0.05	<0.05	<0.05	
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.07	<0.05	<0.05	<0.05	<0.05	
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.07	<0.05	<0.05	<0.05	<0.05	
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L	91.3	17.4	20.3	3.07	3.20	
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	63.4	12.6	17.0	2.65	2.52	
Sum of PFAS (WA DER List)	----	0.01	µg/L	84.5	15.7	19.5	2.92	3.03	
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%	92.0	98.0	87.0	93.8	104	
13C8-PFOA	----	0.02	%	92.0	87.0	90.0	100	103	



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	0229_MW102_201029	0229_MW121_201029	0229_SW121_201029	0229_SW134_201029	0229_SW132_201029
Client sampling date / time				29-Oct-2020 11:52	29-Oct-2020 13:14	29-Oct-2020 14:45	29-Oct-2020 15:24	29-Oct-2020 15:42	
Compound	CAS Number	LOR	Unit	ET2004277-018	ET2004277-021	ET2004277-026	ET2004277-029	ET2004277-031	
				Result	Result	Result	Result	Result	
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	0.13	0.05	0.35	<0.02	0.09	
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	0.08	0.04	0.32	<0.02	0.06	
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.02	µg/L	0.54	0.33	2.13	<0.02	0.38	
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	0.03	<0.02	0.06	<0.02	<0.02	
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	0.88	0.06	1.19	<0.01	0.74	
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	<0.3	<0.1	<0.1	
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	<0.02	0.12	<0.02	<0.02	
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	0.06	<0.02	0.71	<0.02	0.09	
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	<0.02	0.06	<0.02	<0.02	
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	0.02	<0.01	0.09	<0.01	0.03	
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	<0.02	0.06	<0.02	<0.02	
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02	
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02	
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02	
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02	
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05	
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02	
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05	
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05	



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	0229_MW102_201029	0229_MW121_201029	0229_SW121_201029	0229_SW134_201029	0229_SW132_201029
Client sampling date / time					29-Oct-2020 11:52	29-Oct-2020 13:14	29-Oct-2020 14:45	29-Oct-2020 15:24	29-Oct-2020 15:42
Compound	CAS Number	LOR	Unit	ET2004277-018	ET2004277-021	ET2004277-026	ET2004277-029	ET2004277-031	
				Result	Result	Result	Result	Result	
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05	
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05	
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02	
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02	
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05	
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	0.12	<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	0.48	5.09	<0.01	1.39	
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	1.42	0.39	3.32	<0.01	1.12	
Sum of PFAS (WA DER List)	----	0.01	µg/L	1.75	0.44	4.65	<0.01	1.33	
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%	105	106	94.4	94.5	103	
13C8-PFOA	----	0.02	%	98.6	98.5	96.4	95.2	96.0	



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)		Client sample ID			0229_QC301_201029	----	----	----	----
Client sampling date / time		29-Oct-2020 16:37			----	----	----	----	
Compound	CAS Number	LOR	Unit	ET2004277-037	-----	-----	-----	-----	
				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	0.02	µg/L	<0.02	----	----	----	----	
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	----	----	----	----	
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	----	----	----	----	



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)		Client sample ID			0229_QC301_201029	----	----	----	----
		Client sampling date / time			29-Oct-2020 16:37	----	----	----	----
Compound	CAS Number	LOR	Unit	ET2004277-037	-----	-----	-----	-----	
				Result	----	----	----	----	
EP231C: Perfluoroalkyl Sulfonamides - Continued									
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	%	106	----	----	----	----	
13C8-PFOA	----	0.02	%	98.9	----	----	----	----	



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

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

Sub-Matrix: SURFACE WATER		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 : ET2004277-AB
Amendment : 1

Page : 1 of 11

Client : AECOM Australia Pty Ltd
Contact :
Address :
Telephone :
Project : QLD_0229_PFASOMP_20
Order number : 60612487_3.1
C-O-C number : 15323
Sampler :
Site : QLD_0229
Quote number : TV/123/20
No. of samples received : 36
No. of samples analysed : 36

Laboratory : Environmental Division Townsville
Contact :
Address :
Telephone :
Date Samples Received : 29-Oct-2020
Date Analysis Commenced : 03-Nov-2020
Issue Date : 17-Nov-2020



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. 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 signatory information]



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

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	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
EA055: Moisture Content (Dried @ 105-110°C) (QC Lot: 3342684)									
ET2004277-004	0229_SD139_201029	EA055: Moisture Content	----	0.1	%	51.8	56.6	8.88	0% - 20%
ET2004277-030	0229_SD134_201029	EA055: Moisture Content	----	0.1	%	43.3	44.5	2.83	0% - 20%
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 3342683)									
ET2004277-004	0229_SD139_201029	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0010	<0.0010	0.00	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0010	<0.0010	0.00	No Limit
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	0.0024	0.0029	15.4	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0010	<0.0010	0.00	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	0.0227	0.0275	19.2	0% - 20%
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0010	<0.0010	0.00	No Limit
ET2004277-030	0229_SD134_201029	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	<0.0002	0.00	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	<0.0002	0.00	No Limit
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	<0.0002	0.00	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	<0.0002	0.00	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	0.0003	<0.0002	52.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	<0.0002	0.00	No Limit
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 3342683)									
ET2004277-004	0229_SD139_201029	EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0010	<0.0010	0.00	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0010	<0.0010	0.00	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0010	<0.0010	0.00	No Limit
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0010	<0.0010	0.00	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0010	<0.0010	0.00	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0010	<0.0010	0.00	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0010	<0.0010	0.00	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0010	<0.0010	0.00	No Limit



Sub-Matrix: SOIL				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 3342683) - continued									
ET2004277-004	0229_SD139_201029	EP231X: Perfluorotridecanoic acid (PFTTrDA)	72629-94-8	0.0002	mg/kg	<0.0010	<0.0010	0.00	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0025	<0.0025	0.00	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.005	<0.005	0.00	No Limit
ET2004277-030	0229_SD134_201029	EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	<0.0002	0.00	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	<0.0002	0.00	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	<0.0002	0.00	No Limit
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	<0.0002	0.00	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	<0.0002	0.00	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	<0.0002	0.00	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.00	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	<0.0002	0.00	No Limit
		EP231X: Perfluorotridecanoic acid (PFTTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.00	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	<0.0005	0.00	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	<0.001	0.00	No Limit
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 3342683)									
ET2004277-004	0229_SD139_201029	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0010	<0.0010	0.00	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0010	<0.0010	0.00	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0010	<0.0010	0.00	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0025	<0.0025	0.00	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0025	<0.0025	0.00	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0025	<0.0025	0.00	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0025	<0.0025	0.00	No Limit
ET2004277-030	0229_SD134_201029	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	<0.0002	0.00	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	<0.0002	0.00	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	<0.0002	0.00	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	<0.0005	0.00	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	<0.0005	0.00	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	<0.0005	0.00	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	<0.0005	0.00	No Limit



Sub-Matrix: SOIL				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 3342683)									
ET2004277-004	0229_SD139_201029	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0010	<0.0010	0.00	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0010	<0.0010	0.00	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0010	<0.0010	0.00	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0010	<0.0010	0.00	No Limit
ET2004277-030	0229_SD134_201029	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	<0.0005	0.00	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	<0.0005	0.00	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	<0.0005	0.00	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	<0.0005	0.00	No Limit
Sub-Matrix: WATER									
Sub-Matrix: WATER				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 3342951)									
ET2004277-018	0229_MW102_201029	EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	0.88	0.90	2.30	0% - 20%
		EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	0.13	0.13	0.00	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	0.08	0.08	0.00	No Limit
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.02	µg/L	0.54	0.56	2.82	0% - 20%
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	0.03	0.03	0.00	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	<0.02	0.00	No Limit
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 3344719)									
ET2004277-019	0229_MW101_201029	EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	1.27	1.33	4.50	0% - 20%
		EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	0.20	0.21	0.00	0% - 50%
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	0.10	0.10	0.00	No Limit
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.02	µg/L	0.80	0.82	3.59	0% - 20%
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	0.04	0.04	0.00	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	<0.02	0.00	No Limit
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 3342951)									
ET2004277-018	0229_MW102_201029	EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	0.02	0.02	0.00	No Limit
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	0.06	0.06	0.00	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	<0.02	0.00	No Limit



Sub-Matrix: WATER				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 3342951) - continued									
ET2004277-018	0229_MW102_201029	EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	<0.05	0.00	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	<0.1	0.00	No Limit
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 3344719)									
ET2004277-019	0229_MW101_201029	EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	0.04	0.04	0.00	No Limit
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	0.03	0.03	0.00	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	0.13	0.13	0.00	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	0.02	0.02	0.00	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	<0.05	0.00	No Limit
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	<0.1	0.00	No Limit		
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 3342951)									
ET2004277-018	0229_MW102_201029	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	<0.05	0.00	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	<0.05	0.00	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	<0.05	0.00	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	<0.05	0.00	No Limit
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 3344719)									
ET2004277-019	0229_MW101_201029	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	<0.05	0.00	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	<0.05	0.00	No Limit



Sub-Matrix: WATER				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 3344719) - continued									
ET2004277-019	0229_MW101_201029	EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	<0.05	0.00	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	<0.05	0.00	No Limit
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 3342951)									
ET2004277-018	0229_MW102_201029	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	<0.05	0.00	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	0.12	0.12	0.00	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	<0.05	0.00	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	<0.05	0.00	No Limit
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 3344719)									
ET2004277-019	0229_MW101_201029	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	<0.05	0.00	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	<0.05	0.00	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	<0.05	0.00	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	<0.05	0.00	No Limit
EP231P: PFAS Sums (QC Lot: 3342951)									
ET2004277-018	0229_MW102_201029	EP231X: Sum of PFAS	----	0.01	µg/L	1.86	1.90	2.13	0% - 20%
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	1.42	1.46	2.78	0% - 20%
		EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	1.75	1.79	2.26	0% - 20%
EP231P: PFAS Sums (QC Lot: 3344719)									
ET2004277-019	0229_MW101_201029	EP231X: Sum of PFAS	----	0.01	µg/L	2.63	2.72	3.36	0% - 20%
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	2.07	2.15	3.79	0% - 20%
		EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	2.49	2.58	3.55	0% - 20%



Method Blank (MB) and Laboratory Control Spike (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 Spike (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: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report				
				Result	Spike Concentration	Spike Recovery (%)		Recovery Limits (%)	
						LCS	Low	High	
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 3342683)									
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	0.0011 mg/kg	95.4	72.0	128	
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	0.00117 mg/kg	91.9	73.0	123	
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	0.00118 mg/kg	83.0	67.0	130	
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	0.00119 mg/kg	95.0	70.0	132	
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	0.00116 mg/kg	99.6	68.0	136	
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	0.0012 mg/kg	104	59.0	134	
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 3342683)									
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	0.00625 mg/kg	88.6	71.0	135	
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	0.00125 mg/kg	91.2	69.0	132	
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	0.00125 mg/kg	90.0	70.0	132	
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	0.00125 mg/kg	81.2	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	92.8	72.0	129	
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	0.00125 mg/kg	86.8	69.0	133	
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	98.4	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	95.2	66.0	139	
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	0.00312 mg/kg	101	69.0	133	
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 3342683)									
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	0.00125 mg/kg	90.0	67.0	137	
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	0.00312 mg/kg	101	59.6	143	
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	0.00312 mg/kg	101	62.8	140	
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	0.00312 mg/kg	89.7	61.5	139	
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	0.00312 mg/kg	85.2	61.9	137	
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	101	61.0	139	
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 3342683)									
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	0.00117 mg/kg	95.7	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	116	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	97.9	65.0	137	



Sub-Matrix: **SOIL**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report Result	Laboratory Control Spike (LCS) Report				
					Spike Concentration	Spike Recovery (%)		Recovery Limits (%)	
						LCS	Low	High	
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 3342683) - continued									
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	0.0012 mg/kg	96.2	54.8	124	

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report Result	Laboratory Control Spike (LCS) Report				
					Spike Concentration	Spike Recovery (%)		Recovery Limits (%)	
						LCS	Low	High	
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 3342951)									
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.2218 µg/L	88.8	72.0	130	
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.2352 µg/L	107	71.0	127	
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.02	µg/L	<0.02	0.2373 µg/L	70.4	68.0	131	
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.238 µg/L	89.5	69.0	134	
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.232 µg/L	77.2	65.0	140	
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.241 µg/L	77.4	53.0	142	
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 3344719)									
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	98.8	71.0	127	
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.02	µg/L	<0.02	0.2373 µg/L	94.8	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	100	65.0	140	
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.241 µg/L	104	53.0	142	
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 3342951)									
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	1.25 µg/L	87.5	73.0	129	
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	0.25 µg/L	91.8	72.0	129	
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	0.25 µg/L	88.2	72.0	129	
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	0.25 µg/L	93.6	72.0	130	
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	0.25 µg/L	76.8	71.0	133	
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	0.25 µg/L	88.8	69.0	130	
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	0.25 µg/L	84.6	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	79.2	72.0	134	
EP231X: Perfluorotridecanoic acid (PFTTrDA)	72629-94-8	0.02	µg/L	<0.02	0.25 µg/L	85.2	65.0	144	
EP231X: Perfluorotetradecanoic acid (PFTTeDA)	376-06-7	0.05	µg/L	<0.05	0.625 µg/L	78.8	71.0	132	
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 3344719)									
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	1.25 µg/L	84.2	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	96.4	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	94.2	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	93.6	71.0	129	



Sub-Matrix: WATER

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report Result	Laboratory Control Spike (LCS) Report				
					Spike Concentration	Spike Recovery (%)		Recovery Limits (%)	
						LCS	Low	High	
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 3344719) - continued									
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	0.25 µg/L	99.6	69.0	133	
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	0.25 µg/L	109	72.0	134	
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	0.25 µg/L	101	65.0	144	
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	0.625 µg/L	111	71.0	132	
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 3342951)									
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.25 µg/L	87.0	67.0	137	
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	0.625 µg/L	81.6	68.0	141	
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	0.625 µg/L	77.6	60.5	138	
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	0.625 µg/L	87.9	68.3	134	
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	0.625 µg/L	85.7	62.6	138	
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	0.25 µg/L	82.0	65.0	136	
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	0.25 µg/L	87.8	61.0	135	
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 3344719)									
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.25 µg/L	97.6	67.0	137	
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	0.625 µg/L	96.4	68.0	141	
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	0.625 µg/L	104	60.5	138	
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	96.7	62.6	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	108	61.0	135	
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 3342951)									
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	87.9	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	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	87.8	64.2	133	
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 3344719)									
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.2343 µg/L	99.6	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	98.0	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	99.2	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	120	64.2	133	
EP231P: PFAS Sums (QCLot: 3342951)									



Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report Result	Laboratory Control Spike (LCS) Report			
					Spike Concentration	Spike Recovery (%)	Recovery Limits (%)	
						LCS	Low	High
EP231P: PFAS Sums (QCLot: 3342951) - continued								
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: 3344719)								
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: **SOIL**

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report			
				Spike Concentration	Spike Recovery (%) MS	Recovery Limits (%)	
						Low	High
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 3342683)							
ET2004277-005	0229_QC103_201029	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0011 mg/kg	# Not Determined	72.0	128
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.00117 mg/kg	# Not Determined	73.0	123
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.00118 mg/kg	# Not Determined	67.0	130
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.00119 mg/kg	# Not Determined	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	# Not Determined	59.0	134
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 3342683)							
ET2004277-005	0229_QC103_201029	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.00625 mg/kg	# Not Determined	71.0	135
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.00125 mg/kg	# Not Determined	69.0	132
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.00125 mg/kg	# Not Determined	70.0	132
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.00125 mg/kg	# Not Determined	71.0	131



Sub-Matrix: SOIL

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Recovery Limits (%)	
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 3342683) - continued							
ET2004277-005	0229_QC103_201029	EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.00125 mg/kg	# Not Determined	69.0	133
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.00125 mg/kg	# Not Determined	72.0	129
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.00125 mg/kg	# Not Determined	69.0	133
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.00125 mg/kg	# Not Determined	64.0	136
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.00125 mg/kg	# Not Determined	69.0	135
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.00125 mg/kg	# Not Determined	66.0	139
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.00312 mg/kg	# Not Determined	69.0	133
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 3342683)							
ET2004277-005	0229_QC103_201029	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.00125 mg/kg	# Not Determined	48.0	128
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.00312 mg/kg	# Not Determined	70.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.00312 mg/kg	# Not Determined	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.00312 mg/kg	# Not Determined	70.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.00312 mg/kg	# Not Determined	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.00125 mg/kg	# Not Determined	63.0	144
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.00125 mg/kg	# Not Determined	61.0	139
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 3342683)							
ET2004277-005	0229_QC103_201029	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.00117 mg/kg	# Not Determined	62.0	145
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.00118 mg/kg	# Not Determined	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0012 mg/kg	# Not Determined	65.0	137
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0012 mg/kg	# Not Determined	70.0	130

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: ET2004277	Page	: 1 of 7
Amendment	: 1		
Client	: AECOM Australia Pty Ltd	Laboratory	: Environmental Division Townsville
Contact	: [REDACTED]	Telephone	: [REDACTED]
Project	: QLD_0229_PFASOMP_20	Date Samples Received	: 29-Oct-2020
Site	: QLD_0229	Issue Date	: 17-Nov-2020
Sampler	: [REDACTED]	No. of samples received	: 37
Order number	: 60612487_3.1	No. of samples analysed	: 37

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: **SOIL**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
Matrix Spike (MS) Recoveries							
EP231A: Perfluoroalkyl Sulfonic Acids	ET2004277--005	0229_QC103_201029	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
	QC	Regular	Actual	Expected	
Laboratory Duplicates (DUP)					
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	2	21	9.52	10.00	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)					
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	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: **SOIL**

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

Method	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)								
0229_SD139_201029,	0229_QC103_201029,	29-Oct-2020	----	----	----	03-Nov-2020	12-Nov-2020	✓
0229_SD110_201029,	0229_SD109_201029,							
0229_SD140_201029,	0229_SD119_201029,							
0229_SD137_201029,	0229_QC105_201029,							
0229_SD121_201029,	0229_SD133_201029,							
0229_SD134_201029,	0229_SD132_201029,							
0229_SD130_201029,	0229_SD129_201029,							
0229_SD128_201029,	0229_SD126_201029							



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	
EP231A: Perfluoroalkyl Sulfonic Acids								
HDPE Soil Jar (EP231X)								
0229_SD139_201029,	0229_QC103_201029,	29-Oct-2020	05-Nov-2020	27-Apr-2021	✓	05-Nov-2020	15-Dec-2020	✓
0229_SD110_201029,	0229_SD109_201029,							
0229_SD140_201029,	0229_SD119_201029,							
0229_SD137_201029,	0229_QC105_201029,							
0229_SD121_201029,	0229_SD133_201029,							
0229_SD134_201029,	0229_SD132_201029,							
0229_SD130_201029,	0229_SD129_201029,							
0229_SD128_201029,	0229_SD126_201029							
EP231B: Perfluoroalkyl Carboxylic Acids								
HDPE Soil Jar (EP231X)								
0229_SD139_201029,	0229_QC103_201029,	29-Oct-2020	05-Nov-2020	27-Apr-2021	✓	05-Nov-2020	15-Dec-2020	✓
0229_SD110_201029,	0229_SD109_201029,							
0229_SD140_201029,	0229_SD119_201029,							
0229_SD137_201029,	0229_QC105_201029,							
0229_SD121_201029,	0229_SD133_201029,							
0229_SD134_201029,	0229_SD132_201029,							
0229_SD130_201029,	0229_SD129_201029,							
0229_SD128_201029,	0229_SD126_201029							
EP231C: Perfluoroalkyl Sulfonamides								
HDPE Soil Jar (EP231X)								
0229_SD139_201029,	0229_QC103_201029,	29-Oct-2020	05-Nov-2020	27-Apr-2021	✓	05-Nov-2020	15-Dec-2020	✓
0229_SD110_201029,	0229_SD109_201029,							
0229_SD140_201029,	0229_SD119_201029,							
0229_SD137_201029,	0229_QC105_201029,							
0229_SD121_201029,	0229_SD133_201029,							
0229_SD134_201029,	0229_SD132_201029,							
0229_SD130_201029,	0229_SD129_201029,							
0229_SD128_201029,	0229_SD126_201029							
EP231D: (n:2) Fluorotelomer Sulfonic Acids								
HDPE Soil Jar (EP231X)								
0229_SD139_201029,	0229_QC103_201029,	29-Oct-2020	05-Nov-2020	27-Apr-2021	✓	05-Nov-2020	15-Dec-2020	✓
0229_SD110_201029,	0229_SD109_201029,							
0229_SD140_201029,	0229_SD119_201029,							
0229_SD137_201029,	0229_QC105_201029,							
0229_SD121_201029,	0229_SD133_201029,							
0229_SD134_201029,	0229_SD132_201029,							
0229_SD130_201029,	0229_SD129_201029,							
0229_SD128_201029,	0229_SD126_201029							



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)								
0229_SD139_201029, 0229_SD110_201029, 0229_SD140_201029, 0229_SD137_201029, 0229_SD121_201029, 0229_SD134_201029, 0229_SD130_201029, 0229_SD128_201029,	0229_QC103_201029, 0229_SD109_201029, 0229_SD119_201029, 0229_QC105_201029, 0229_SD133_201029, 0229_SD132_201029, 0229_SD129_201029, 0229_SD126_201029	29-Oct-2020	05-Nov-2020	27-Apr-2021	✓	05-Nov-2020	15-Dec-2020	✓

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)								
0229_MW226_201029, 0229_MW138_201029, 0229_QC102_201029, 0229_MW105_201029, 0229_MW065_201029, 0229_MW122_201029, 0229_MW102_201029	0229_MW003_201029, 0229_SW139_201029, 0229_MW128_201029, 0229_MW123_S_201029, 0229_QC104_201029, 0229_SW140_201029,	29-Oct-2020	03-Nov-2020	27-Apr-2021	✓	03-Nov-2020	27-Apr-2021	✓
HDPE (no PTFE) (EP231X)								
0229_MW101_201029, 0229_MW121_201029, 0229_SW121_201029, 0229_SW132_201029,	0229_MW120_201029, 0229_SW119_201029, 0229_SW134_201029, 0229_QC301_201029	29-Oct-2020	04-Nov-2020	27-Apr-2021	✓	05-Nov-2020	27-Apr-2021	✓
EP231B: Perfluoroalkyl Carboxylic Acids								
HDPE (no PTFE) (EP231X)								
0229_MW226_201029, 0229_MW138_201029, 0229_QC102_201029, 0229_MW105_201029, 0229_MW065_201029, 0229_MW122_201029, 0229_MW102_201029	0229_MW003_201029, 0229_SW139_201029, 0229_MW128_201029, 0229_MW123_S_201029, 0229_QC104_201029, 0229_SW140_201029,	29-Oct-2020	03-Nov-2020	27-Apr-2021	✓	03-Nov-2020	27-Apr-2021	✓
HDPE (no PTFE) (EP231X)								
0229_MW101_201029, 0229_MW121_201029, 0229_SW121_201029, 0229_SW132_201029,	0229_MW120_201029, 0229_SW119_201029, 0229_SW134_201029, 0229_QC301_201029	29-Oct-2020	04-Nov-2020	27-Apr-2021	✓	05-Nov-2020	27-Apr-2021	✓



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) 0229_MW226_201029, 0229_MW138_201029, 0229_QC102_201029, 0229_MW105_201029, 0229_MW065_201029, 0229_MW122_201029, 0229_MW102_201029	0229_MW003_201029, 0229_SW139_201029, 0229_MW128_201029, 0229_MW123_S_201029, 0229_QC104_201029, 0229_SW140_201029,	29-Oct-2020	03-Nov-2020	27-Apr-2021	✓	03-Nov-2020	27-Apr-2021	✓
HDPE (no PTFE) (EP231X) 0229_MW101_201029, 0229_MW121_201029, 0229_SW121_201029, 0229_SW132_201029,	0229_MW120_201029, 0229_SW119_201029, 0229_SW134_201029, 0229_QC301_201029	29-Oct-2020	04-Nov-2020	27-Apr-2021	✓	05-Nov-2020	27-Apr-2021	✓
EP231D: (n:2) Fluorotelomer Sulfonic Acids								
HDPE (no PTFE) (EP231X) 0229_MW226_201029, 0229_MW138_201029, 0229_QC102_201029, 0229_MW105_201029, 0229_MW065_201029, 0229_MW122_201029, 0229_MW102_201029	0229_MW003_201029, 0229_SW139_201029, 0229_MW128_201029, 0229_MW123_S_201029, 0229_QC104_201029, 0229_SW140_201029,	29-Oct-2020	03-Nov-2020	27-Apr-2021	✓	03-Nov-2020	27-Apr-2021	✓
HDPE (no PTFE) (EP231X) 0229_MW101_201029, 0229_MW121_201029, 0229_SW121_201029, 0229_SW132_201029,	0229_MW120_201029, 0229_SW119_201029, 0229_SW134_201029, 0229_QC301_201029	29-Oct-2020	04-Nov-2020	27-Apr-2021	✓	05-Nov-2020	27-Apr-2021	✓
EP231P: PFAS Sums								
HDPE (no PTFE) (EP231X) 0229_MW226_201029, 0229_MW138_201029, 0229_QC102_201029, 0229_MW105_201029, 0229_MW065_201029, 0229_MW122_201029, 0229_MW102_201029	0229_MW003_201029, 0229_SW139_201029, 0229_MW128_201029, 0229_MW123_S_201029, 0229_QC104_201029, 0229_SW140_201029,	29-Oct-2020	03-Nov-2020	27-Apr-2021	✓	03-Nov-2020	27-Apr-2021	✓
HDPE (no PTFE) (EP231X) 0229_MW101_201029, 0229_MW121_201029, 0229_SW121_201029, 0229_SW132_201029,	0229_MW120_201029, 0229_SW119_201029, 0229_SW134_201029, 0229_QC301_201029	29-Oct-2020	04-Nov-2020	27-Apr-2021	✓	05-Nov-2020	27-Apr-2021	✓



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	Method	Count		Rate (%)			Quality Control Specification
		QC	Regular	Actual	Expected	Evaluation	
Analytical Methods							
Laboratory Duplicates (DUP)							
Moisture Content	EA055	2	16	12.50	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
Laboratory Control Samples (LCS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	16	6.25	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	16	6.25	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	16	6.25	5.00	✔	NEPM 2013 B3 & ALS QC Standard

Matrix: **WATER** Evaluation: ✖ = Quality Control frequency not within specification ; ✔ = Quality Control frequency within specification.

Quality Control Sample Type	Method	Count		Rate (%)			Quality Control Specification
		QC	Regular	Actual	Expected	Evaluation	
Analytical Methods							
Laboratory Duplicates (DUP)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	21	9.52	10.00	✖	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	21	9.52	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	21	9.52	5.00	✔	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



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.
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
Sample Extraction for PFAS in solid matrices	ORG73	SOIL	In-house: 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 conform to US DoD QSM 5.3, table B-15 requirements.
Solid Phase Extraction (SPE) for PFAS in water	ORG72	WATER	In-house: Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to the sample container. The entire contents are transferred to a solid phase extraction (SPE) cartridge. The sample container is successively rinsed with aliquots of the elution solvent. The eluted extract is combined with an equal volume of reagent water and a portion is filtered for analysis. Method procedures conform to US DoD QSM 5.3, table B-15 requirements.



SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : ET2004277

Amendment : 1

Client : AECOM Australia Pty Ltd

Contact : [REDACTED]

Address : [REDACTED]

Laboratory : Environmental Division Townsville

Contact : [REDACTED]

Address : [REDACTED]
QLD Australia 4814

E-mail : [REDACTED]

Telephone : ----

Facsimile : ----

E-mail : [REDACTED]

Telephone : [REDACTED]

Facsimile : [REDACTED]

Project : QLD_0229_PFASOMP_20

Order number : 60612487_3.1

C-O-C number : 15323

Site : QLD_0229

Sampler : [REDACTED]

Page : 1 of 4

Quote number : ET2020AECOMAU0001 (TV/123/20)

QC Level : NEPM 2013 B3 & ALS QC Standard

Dates

Date Samples Received : 29-Oct-2020 17:05

Client Requested Due Date : 09-Nov-2020

Issue Date : 17-Nov-2020

Scheduled Reporting Date : 09-Nov-2020

Delivery Details

Mode of Delivery : Client Drop Off

No. of coolers/boxes : 1

Receipt Detail : LARGE ESKY

Security Seal : Not Available

Temperature : 5.0°C - Ice present

No. of samples received / analysed : 37 / 37

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
- ***17/11/2020*: SRN has been resent to acknowledge splitting of reports as per client request from [REDACTED]. For any further information regarding these adjustments please contact client services at [REDACTED]**
- Discounted Package Prices apply only when specific ALS Group Codes ('W', 'S', 'NT' suites) are referenced on COCs.
- Please direct any turn around / technical queries to the laboratory contact designated above.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months ± 1 week) from receipt of samples.
- All analysis will be conducted by ALS Environmental, Brisbane, NATA accreditation no. 825, Site No. 818.
- 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	Client sampling date / time	Client sample ID	SOIL - EA055-103 Moisture Content	SOIL - EP231X (solids) PFAS - Full Suite (28 analytes)
ET2004277-004	29-Oct-2020 08:40	0229_SD139_201029	✓	✓
ET2004277-005	29-Oct-2020 08:41	0229_QC103_201029	✓	✓
ET2004277-010	29-Oct-2020 09:22	0229_SD110_201029	✓	✓
ET2004277-011	29-Oct-2020 09:43	0229_SD109_201029	✓	✓
ET2004277-017	29-Oct-2020 11:28	0229_SD140_201029	✓	✓
ET2004277-023	29-Oct-2020 13:45	0229_SD119_201029	✓	✓
ET2004277-024	29-Oct-2020 14:13	0229_SD137_201029	✓	✓
ET2004277-025	29-Oct-2020 14:14	0229_QC105_201029	✓	✓
ET2004277-027	29-Oct-2020 14:46	0229_SD121_201029	✓	✓
ET2004277-028	29-Oct-2020 15:17	0229_SD133_201029	✓	✓
ET2004277-030	29-Oct-2020 15:25	0229_SD134_201029	✓	✓
ET2004277-032	29-Oct-2020 15:43	0229_SD132_201029	✓	✓
ET2004277-033	29-Oct-2020 15:57	0229_SD130_201029	✓	✓
ET2004277-034	29-Oct-2020 16:07	0229_SD129_201029	✓	✓
ET2004277-035	29-Oct-2020 16:11	0229_SD128_201029	✓	✓
ET2004277-036	29-Oct-2020 16:33	0229_SD126_201029	✓	✓

Matrix: **WATER**

Laboratory sample ID	Client sampling date / time	Client sample ID	WATER - EP231X PFAS - Full Suite (28 analytes)
ET2004277-001	29-Oct-2020 07:23	0229_MW226_201029	✓
ET2004277-002	29-Oct-2020 07:56	0229_MW003_201029	✓
ET2004277-003	29-Oct-2020 08:14	0229_MW138_201029	✓
ET2004277-006	29-Oct-2020 08:42	0229_SW139_201029	✓
ET2004277-007	29-Oct-2020 08:43	0229_QC102_201029	✓
ET2004277-008	29-Oct-2020 09:07	0229_MW128_201029	✓
ET2004277-009	29-Oct-2020 09:08	0229_MW105_201029	✓



WATER - EP231X
PFAS - Full Suite (28 analytes)

ET2004277-012	29-Oct-2020 10:06	0229_MW123_S_201029	✓
ET2004277-013	29-Oct-2020 10:31	0229_MW065_201029	✓
ET2004277-014	29-Oct-2020 10:33	0229_QC104_201029	✓
ET2004277-015	29-Oct-2020 10:56	0229_MW122_201029	✓
ET2004277-016	29-Oct-2020 11:27	0229_SW140_201029	✓
ET2004277-018	29-Oct-2020 11:52	0229_MW102_201029	✓
ET2004277-019	29-Oct-2020 12:06	0229_MW101_201029	✓
ET2004277-020	29-Oct-2020 13:00	0229_MW120_201029	✓
ET2004277-021	29-Oct-2020 13:14	0229_MW121_201029	✓
ET2004277-022	29-Oct-2020 13:44	0229_SW119_201029	✓
ET2004277-026	29-Oct-2020 14:45	0229_SW121_201029	✓
ET2004277-029	29-Oct-2020 15:24	0229_SW134_201029	✓
ET2004277-031	29-Oct-2020 15:42	0229_SW132_201029	✓
ET2004277-037	29-Oct-2020 16:37	0229_QC301_201029	✓

Proactive Holding Time Report

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



Requested Deliverables

ACCOUNTS PAYABLE

- A4 - AU Tax Invoice (INV)

Email

[Redacted]

[Redacted]

- *AU Certificate of Analysis - NATA (COA)
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)
- A4 - AU Tax Invoice (INV)
- Chain of Custody (CoC) (COC)
- EDI Format - ENMRG (ENMRG)
- EDI Format - ESDAT (ESDAT)

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DERP ESDAT REPORTS

- EDI Format - ESDAT (ESDAT)

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[Redacted]

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

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

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CERTIFICATE OF ANALYSIS

Work Order : ET2004277-AA
Amendment : 1
Client : AECOM Australia Pty Ltd
Contact : [Redacted]
Address : [Redacted]
Telephone : ----
Project : QLD_0229_PFASOMP_20
Order number : 60612487_3.1
C-O-C number : 15323
Sampler : [Redacted]
Site : QLD_0229
Quote number : TV/123/20
No. of samples received : 1
No. of samples analysed : 1

Page : 1 of 5
Laboratory : Environmental Division Townsville
Contact : [Redacted]
Address : [Redacted]
Telephone : [Redacted]
Date Samples Received : 29-Oct-2020 17:05
Date Analysis Commenced : 03-Nov-2020
Issue Date : 17-Nov-2020 11:23



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. 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.

Table with 3 columns: Signatories, Position, Accreditation Category. Row 1 is redacted.



General Comments

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

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

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

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

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

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

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

- EP231X - Per- and Polyfluoroalkyl Substances (PFAS): Samples received in 20ml or 125ml bottles have been tested in accordance with the QSM5.3 compliant, NATA accredited method. 60mL or 250mL bottles have been tested to the legacy QSM 5.1 aligned, NATA accredited method.
- EP231X PFAS: Particular samples required dilution due to the presence of high level contaminants and matrix interferences. LOR values have been adjusted accordingly. Matrix spike and particular surrogate recoveries not determined.
- Amendment (17/11/2020): This report has been amended following the separation of sample "0229_MW226_201029" to a separate COA as per client request from [REDACTED]. All analysis results are as per the previous report.
- EP231X PFAS: The LOR of PFBA for sample "0229_SW119_201029" and "0229_SW121_201029" has been raised due to sample matrix interferences.
- EP231X PFAS: The LOR of PFDS for sample "0229_SD109_201029" has been raised due to sample matrix interferences.
- All analysis will be conducted by ALS Environmental, Brisbane, NATA accreditation no. 825, Site No. 818.
- 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.
- EP231: Stable isotope enriched internal standards are added to samples prior to extraction. Target compounds have a direct analogous internal standard with the exception of PFPeS, PFHpA, PFDS, PFTrDA and 10:2 FTS. These compounds use an internal standard that is chemically related and has a retention time close to that of the target compound. The DQO for internal standard response is 50-150% of that established at initial calibration. PFOS is quantified using a certified, traceable standard consisting of linear and branched PFOS isomers. These practices are in line with recommendations in the National Environmental Management Plan for PFAS (Australian HEPA) and also conform to QSM 5.3 (US DoD) requirements.



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)		Client sample ID			0229_MW226_201029	----	----	----	----
Client sampling date / time		29-Oct-2020 07:23			----	----	----	----	
Compound	CAS Number	LOR	Unit	ET2004277-001	-----	-----	-----	-----	
				Result	----	----	----	----	
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	0.07	----	----	----	----	
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	0.04	----	----	----	----	
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.02	µg/L	0.26	----	----	----	----	
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	----	----	----	----	
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	0.16	----	----	----	----	
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	0.03	----	----	----	----	
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	----	----	----	----	



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)		Client sample ID			0229_MW226_201029	----	----	----	----
Client sampling date / time		29-Oct-2020 07:23			----	----	----	----	
Compound	CAS Number	LOR	Unit	ET2004277-001	-----	-----	-----	-----	
				Result	----	----	----	----	
EP231C: Perfluoroalkyl Sulfonamides - Continued									
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	0.56	----	----	----	----	
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	0.42	----	----	----	----	
Sum of PFAS (WA DER List)	----	0.01	µg/L	0.52	----	----	----	----	
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%	104	----	----	----	----	
13C8-PFOA	----	0.02	%	106	----	----	----	----	



Surrogate Control Limits

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

QUALITY CONTROL REPORT

Work Order : **ET2004277-AA**
Amendment : **1**

Page : 1 of 5

Client : **AECOM Australia Pty Ltd**
Contact : [REDACTED]
Address : [REDACTED]
Telephone : ----
Project : **QLD_0229_PFASOMP_20**
Order number : **60612487_3.1**
C-O-C number : **15323**
Sampler : [REDACTED]
Site : **QLD_0229**
Quote number : **TV/123/20**
No. of samples received : **1**
No. of samples analysed : **1**

Laboratory : **Environmental Division Townsville**
Contact : [REDACTED]
Address : [REDACTED]
Telephone : [REDACTED]
Date Samples Received : **29-Oct-2020**
Date Analysis Commenced : **03-Nov-2020**
Issue Date : **17-Nov-2020**



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. 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]	[REDACTED]	[REDACTED]



General Comments

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

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

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

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	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 3342951)									
ET2004277-018	Anonymous	EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	0.88	0.90	2.30	0% - 20%
		EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	0.13	0.13	0.00	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	0.08	0.08	0.00	No Limit
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.02	µg/L	0.54	0.56	2.82	0% - 20%
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	0.03	0.03	0.00	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	<0.02	0.00	No Limit
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 3342951)									
ET2004277-018	Anonymous	EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	0.02	0.02	0.00	No Limit
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	0.06	0.06	0.00	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	<0.05	0.00	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	<0.1	0.00	No Limit
		EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 3342951)							
ET2004277-018	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	<0.02	0.00	No Limit



Sub-Matrix: WATER				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 3342951) - continued									
ET2004277-018	Anonymous	EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	<0.05	0.00	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	<0.05	0.00	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	<0.05	0.00	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	<0.05	0.00	No Limit
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 3342951)									
ET2004277-018	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	<0.05	0.00	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	0.12	0.12	0.00	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	<0.05	0.00	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	<0.05	0.00	No Limit
EP231P: PFAS Sums (QC Lot: 3342951)									
ET2004277-018	Anonymous	EP231X: Sum of PFAS	----	0.01	µg/L	1.86	1.90	2.13	0% - 20%
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	1.42	1.46	2.78	0% - 20%
		EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	1.75	1.79	2.26	0% - 20%



Method Blank (MB) and Laboratory Control Spike (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 Spike (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: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report				
				Result	Spike Concentration	Spike Recovery (%)		Recovery Limits (%)	
						LCS	Low	High	
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 3342951)									
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.2218 µg/L	88.8	72.0	130	
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.2352 µg/L	107	71.0	127	
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.02	µg/L	<0.02	0.2373 µg/L	70.4	68.0	131	
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.238 µg/L	89.5	69.0	134	
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.232 µg/L	77.2	65.0	140	
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.241 µg/L	77.4	53.0	142	
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 3342951)									
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	1.25 µg/L	87.5	73.0	129	
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	0.25 µg/L	91.8	72.0	129	
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	0.25 µg/L	88.2	72.0	129	
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	0.25 µg/L	93.6	72.0	130	
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	0.25 µg/L	76.8	71.0	133	
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	0.25 µg/L	88.8	69.0	130	
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	0.25 µg/L	84.6	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	79.2	72.0	134	
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	0.25 µg/L	85.2	65.0	144	
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	0.625 µg/L	78.8	71.0	132	
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 3342951)									
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.25 µg/L	87.0	67.0	137	
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	0.625 µg/L	81.6	68.0	141	
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	0.625 µg/L	77.6	60.5	138	
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	0.625 µg/L	87.9	68.3	134	
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	0.625 µg/L	85.7	62.6	138	
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	0.25 µg/L	82.0	65.0	136	
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	0.25 µg/L	87.8	61.0	135	
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 3342951)									
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	87.9	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	86.4	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 (%)	Recovery Limits (%)	
						LCS	Low	High
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 3342951) - continued								
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	0.241 µg/L	87.8	64.2	133
EP231P: PFAS Sums (QCLot: 3342951)								
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	: ET2004277	Page	: 1 of 7
Amendment	: 1		
Client	: AECOM Australia Pty Ltd	Laboratory	: Environmental Division Townsville
Contact	: [REDACTED]	Telephone	: [REDACTED]
Project	: QLD_0229_PFASOMP_20	Date Samples Received	: 29-Oct-2020
Site	: QLD_0229	Issue Date	: 17-Nov-2020
Sampler	: [REDACTED]	No. of samples received	: 37
Order number	: 60612487_3.1	No. of samples analysed	: 37

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: **SOIL**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
Matrix Spike (MS) Recoveries							
EP231A: Perfluoroalkyl Sulfonic Acids	ET2004277--005	0229_QC103_201029	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
	QC	Regular	Actual	Expected	
Laboratory Duplicates (DUP)					
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	2	21	9.52	10.00	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)					
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	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: **SOIL**

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

Method	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)								
0229_SD139_201029,	0229_QC103_201029,	29-Oct-2020	----	----	----	03-Nov-2020	12-Nov-2020	✓
0229_SD110_201029,	0229_SD109_201029,							
0229_SD140_201029,	0229_SD119_201029,							
0229_SD137_201029,	0229_QC105_201029,							
0229_SD121_201029,	0229_SD133_201029,							
0229_SD134_201029,	0229_SD132_201029,							
0229_SD130_201029,	0229_SD129_201029,							
0229_SD128_201029,	0229_SD126_201029							



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	
EP231A: Perfluoroalkyl Sulfonic Acids								
HDPE Soil Jar (EP231X)								
0229_SD139_201029,	0229_QC103_201029,	29-Oct-2020	05-Nov-2020	27-Apr-2021	✓	05-Nov-2020	15-Dec-2020	✓
0229_SD110_201029,	0229_SD109_201029,							
0229_SD140_201029,	0229_SD119_201029,							
0229_SD137_201029,	0229_QC105_201029,							
0229_SD121_201029,	0229_SD133_201029,							
0229_SD134_201029,	0229_SD132_201029,							
0229_SD130_201029,	0229_SD129_201029,							
0229_SD128_201029,	0229_SD126_201029							
EP231B: Perfluoroalkyl Carboxylic Acids								
HDPE Soil Jar (EP231X)								
0229_SD139_201029,	0229_QC103_201029,	29-Oct-2020	05-Nov-2020	27-Apr-2021	✓	05-Nov-2020	15-Dec-2020	✓
0229_SD110_201029,	0229_SD109_201029,							
0229_SD140_201029,	0229_SD119_201029,							
0229_SD137_201029,	0229_QC105_201029,							
0229_SD121_201029,	0229_SD133_201029,							
0229_SD134_201029,	0229_SD132_201029,							
0229_SD130_201029,	0229_SD129_201029,							
0229_SD128_201029,	0229_SD126_201029							
EP231C: Perfluoroalkyl Sulfonamides								
HDPE Soil Jar (EP231X)								
0229_SD139_201029,	0229_QC103_201029,	29-Oct-2020	05-Nov-2020	27-Apr-2021	✓	05-Nov-2020	15-Dec-2020	✓
0229_SD110_201029,	0229_SD109_201029,							
0229_SD140_201029,	0229_SD119_201029,							
0229_SD137_201029,	0229_QC105_201029,							
0229_SD121_201029,	0229_SD133_201029,							
0229_SD134_201029,	0229_SD132_201029,							
0229_SD130_201029,	0229_SD129_201029,							
0229_SD128_201029,	0229_SD126_201029							
EP231D: (n:2) Fluorotelomer Sulfonic Acids								
HDPE Soil Jar (EP231X)								
0229_SD139_201029,	0229_QC103_201029,	29-Oct-2020	05-Nov-2020	27-Apr-2021	✓	05-Nov-2020	15-Dec-2020	✓
0229_SD110_201029,	0229_SD109_201029,							
0229_SD140_201029,	0229_SD119_201029,							
0229_SD137_201029,	0229_QC105_201029,							
0229_SD121_201029,	0229_SD133_201029,							
0229_SD134_201029,	0229_SD132_201029,							
0229_SD130_201029,	0229_SD129_201029,							
0229_SD128_201029,	0229_SD126_201029							



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)								
0229_SD139_201029, 0229_SD110_201029, 0229_SD140_201029, 0229_SD137_201029, 0229_SD121_201029, 0229_SD134_201029, 0229_SD130_201029, 0229_SD128_201029,	0229_QC103_201029, 0229_SD109_201029, 0229_SD119_201029, 0229_QC105_201029, 0229_SD133_201029, 0229_SD132_201029, 0229_SD129_201029, 0229_SD126_201029	29-Oct-2020	05-Nov-2020	27-Apr-2021	✓	05-Nov-2020	15-Dec-2020	✓

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)								
0229_MW226_201029, 0229_MW138_201029, 0229_QC102_201029, 0229_MW105_201029, 0229_MW065_201029, 0229_MW122_201029, 0229_MW102_201029	0229_MW003_201029, 0229_SW139_201029, 0229_MW128_201029, 0229_MW123_S_201029, 0229_QC104_201029, 0229_SW140_201029,	29-Oct-2020	03-Nov-2020	27-Apr-2021	✓	03-Nov-2020	27-Apr-2021	✓
HDPE (no PTFE) (EP231X)								
0229_MW101_201029, 0229_MW121_201029, 0229_SW121_201029, 0229_SW132_201029,	0229_MW120_201029, 0229_SW119_201029, 0229_SW134_201029, 0229_QC301_201029	29-Oct-2020	04-Nov-2020	27-Apr-2021	✓	05-Nov-2020	27-Apr-2021	✓
EP231B: Perfluoroalkyl Carboxylic Acids								
HDPE (no PTFE) (EP231X)								
0229_MW226_201029, 0229_MW138_201029, 0229_QC102_201029, 0229_MW105_201029, 0229_MW065_201029, 0229_MW122_201029, 0229_MW102_201029	0229_MW003_201029, 0229_SW139_201029, 0229_MW128_201029, 0229_MW123_S_201029, 0229_QC104_201029, 0229_SW140_201029,	29-Oct-2020	03-Nov-2020	27-Apr-2021	✓	03-Nov-2020	27-Apr-2021	✓
HDPE (no PTFE) (EP231X)								
0229_MW101_201029, 0229_MW121_201029, 0229_SW121_201029, 0229_SW132_201029,	0229_MW120_201029, 0229_SW119_201029, 0229_SW134_201029, 0229_QC301_201029	29-Oct-2020	04-Nov-2020	27-Apr-2021	✓	05-Nov-2020	27-Apr-2021	✓



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) 0229_MW226_201029, 0229_MW138_201029, 0229_QC102_201029, 0229_MW105_201029, 0229_MW065_201029, 0229_MW122_201029, 0229_MW102_201029	0229_MW003_201029, 0229_SW139_201029, 0229_MW128_201029, 0229_MW123_S_201029, 0229_QC104_201029, 0229_SW140_201029,	29-Oct-2020	03-Nov-2020	27-Apr-2021	✓	03-Nov-2020	27-Apr-2021	✓
HDPE (no PTFE) (EP231X) 0229_MW101_201029, 0229_MW121_201029, 0229_SW121_201029, 0229_SW132_201029,	0229_MW120_201029, 0229_SW119_201029, 0229_SW134_201029, 0229_QC301_201029	29-Oct-2020	04-Nov-2020	27-Apr-2021	✓	05-Nov-2020	27-Apr-2021	✓
EP231D: (n:2) Fluorotelomer Sulfonic Acids								
HDPE (no PTFE) (EP231X) 0229_MW226_201029, 0229_MW138_201029, 0229_QC102_201029, 0229_MW105_201029, 0229_MW065_201029, 0229_MW122_201029, 0229_MW102_201029	0229_MW003_201029, 0229_SW139_201029, 0229_MW128_201029, 0229_MW123_S_201029, 0229_QC104_201029, 0229_SW140_201029,	29-Oct-2020	03-Nov-2020	27-Apr-2021	✓	03-Nov-2020	27-Apr-2021	✓
HDPE (no PTFE) (EP231X) 0229_MW101_201029, 0229_MW121_201029, 0229_SW121_201029, 0229_SW132_201029,	0229_MW120_201029, 0229_SW119_201029, 0229_SW134_201029, 0229_QC301_201029	29-Oct-2020	04-Nov-2020	27-Apr-2021	✓	05-Nov-2020	27-Apr-2021	✓
EP231P: PFAS Sums								
HDPE (no PTFE) (EP231X) 0229_MW226_201029, 0229_MW138_201029, 0229_QC102_201029, 0229_MW105_201029, 0229_MW065_201029, 0229_MW122_201029, 0229_MW102_201029	0229_MW003_201029, 0229_SW139_201029, 0229_MW128_201029, 0229_MW123_S_201029, 0229_QC104_201029, 0229_SW140_201029,	29-Oct-2020	03-Nov-2020	27-Apr-2021	✓	03-Nov-2020	27-Apr-2021	✓
HDPE (no PTFE) (EP231X) 0229_MW101_201029, 0229_MW121_201029, 0229_SW121_201029, 0229_SW132_201029,	0229_MW120_201029, 0229_SW119_201029, 0229_SW134_201029, 0229_QC301_201029	29-Oct-2020	04-Nov-2020	27-Apr-2021	✓	05-Nov-2020	27-Apr-2021	✓



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	Method	Count		Rate (%)			Quality Control Specification
		QC	Regular	Actual	Expected	Evaluation	
Analytical Methods							
Laboratory Duplicates (DUP)							
Moisture Content	EA055	2	16	12.50	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
Laboratory Control Samples (LCS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	16	6.25	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	16	6.25	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	16	6.25	5.00	✔	NEPM 2013 B3 & ALS QC Standard

Matrix: **WATER** Evaluation: ✖ = Quality Control frequency not within specification ; ✔ = Quality Control frequency within specification.

Quality Control Sample Type	Method	Count		Rate (%)			Quality Control Specification
		QC	Regular	Actual	Expected	Evaluation	
Analytical Methods							
Laboratory Duplicates (DUP)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	21	9.52	10.00	✖	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	21	9.52	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	21	9.52	5.00	✔	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



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.
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
Sample Extraction for PFAS in solid matrices	ORG73	SOIL	In-house: 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 conform to US DoD QSM 5.3, table B-15 requirements.
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.

CERTIFICATE OF ANALYSIS

Work Order : ET2004329 Amendment : 2 Client : AECOM Australia Pty Ltd Contact : [REDACTED] Address : [REDACTED] Telephone : [REDACTED] Project : QLD_0229_PFASOMP_20 Order number : 60612487_3.1 C-O-C number : 15443 Sampler : [REDACTED] Site : QLD_0229 Quote number : TV/123/20 No. of samples received : 44 No. of samples analysed : 42	Page : 1 of 31 Laboratory : Environmental Division Townsville Contact : [REDACTED] Address : [REDACTED] Telephone : [REDACTED] Date Samples Received : 03-Nov-2020 17:00 Date Analysis Commenced : 05-Nov-2020 Issue Date : 02-Dec-2020 13:27
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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
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[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]	[REDACTED]



General Comments

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

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

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

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

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

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

- Amendment-2 (02/12/2020): This report has been amended to alter the reporting - to exclude samples #8 & #10 from the report. All analysis results are as per the previous report.
- EP231X PFAS: The LOR for PFOS has been raised for sample '0229_QC107_201102' due to matrix interference.
- 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.
- **Amendment (19/11/2020): This report has been amended as a result of a request to remove "extra volume for lab qc" description on some of the samples. All analysis results are as per the previous report.**
- EP231X PFAS: Samples '0229_SD217_201102' and '0229_QC107_201102' required dilution prior to analysis due to matrix interferences. Matrix spike recovery not determined and LOR values have been adjusted accordingly.
- EP231X-INJ PFAS: Samples 0229_MW217_201103 and 0229_MW232_201103 required dilution prior to extraction due to matrix interferences. LOR values have been adjusted accordingly.
- All remaining analysis will be conducted by ALS Environmental, Brisbane, NATA accreditation no. 825, Site No. 818.
- EP231X-INJ PFAS by LCMSMS: Particular samples have been tested to the legacy QSM 5.1 aligned, NATA accredited method due to sample matrix being unsuitable for SPE extraction (high sediment content).
- 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.
- 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.
- EP231X-INJ: The direct injection LCMSMS method may be used where the sample matrix is not suitable for Solid Phase Extraction (e.g. significant particulate load) or where only a single sample container is received.



Analytical Results

Sub-Matrix: GROUNDWATER
 (Matrix: WATER)

Sample ID

				0229_MW125_S_2011 02	0229_MW232_201103	----	----	----
				02-Nov-2020 10:17	03-Nov-2020 16:17	----	----	----
Compound	CAS Number	LOR	Unit	ET2004329-001	ET2004329-044	-----	-----	-----
				Result	Result	---	---	---
EP231A: Perfluoroalkyl Sulfonic Acids								
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	----	<0.10	----	----	----
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	----	<0.10	----	----	----
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.02	µg/L	----	0.10	----	----	----
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	----	<0.10	----	----	----
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	----	0.17	----	----	----
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	----	<0.10	----	----	----
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	0.05	----	----	----	----
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	0.03	----	----	----	----
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.02	µg/L	0.24	----	----	----	----
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	----	----	----	----
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	0.02	----	----	----	----
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	----	----	----	----
EP231B: Perfluoroalkyl Carboxylic Acids								
Perfluorobutanoic acid (PFBA)	375-22-4	0.10	µg/L	----	<0.50	----	----	----
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	----	<0.10	----	----	----
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	----	<0.10	----	----	----
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	----	<0.10	----	----	----
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	----	<0.10	----	----	----
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	----	<0.10	----	----	----
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	----	<0.10	----	----	----
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	----	<0.10	----	----	----
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	----	<0.10	----	----	----



Analytical Results

Sub-Matrix: GROUNDWATER
 (Matrix: WATER)

Sample ID

				0229_MW125_S_2011 02	0229_MW232_201103	----	----	----
				02-Nov-2020 10:17	03-Nov-2020 16:17	----	----	----
Compound	CAS Number	LOR	Unit	ET2004329-001	ET2004329-044	-----	-----	-----
				Result	Result	---	---	---

EP231B: Perfluoroalkyl Carboxylic Acids - Continued

Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	----	<0.10	----	----	----
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	----	<0.25	----	----	----
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	----	<0.10	----	----	----
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	----	<0.25	----	----	----
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	----	<0.25	----	----	----
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	----	<0.25	----	----	----
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	----	<0.25	----	----	----
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	----	<0.10	----	----	----
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	----	<0.10	----	----	----



Analytical Results

Sub-Matrix: GROUNDWATER
 (Matrix: WATER)

Sample ID

				0229_MW125_S_2011 02	0229_MW232_201103	----	----	----
				02-Nov-2020 10:17	03-Nov-2020 16:17	----	----	----
Compound	CAS Number	LOR	Unit	ET2004329-001	ET2004329-044	-----	-----	-----
				Result	Result	---	---	---
EP231C: Perfluoroalkyl Sulfonamides - Continued								
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								
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	----	<0.10	----	----	----
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	----	0.13	----	----	----
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	----	<0.10	----	----	----
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	----	<0.10	----	----	----
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	0.41	----	----	----	----
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	----	0.40	----	----	----



Analytical Results

Sub-Matrix: GROUNDWATER
 (Matrix: WATER)

Sample ID

				0229_MW125_S_2011 02	0229_MW232_201103	----	----	----
				02-Nov-2020 10:17	03-Nov-2020 16:17	----	----	----
Compound	CAS Number	LOR	Unit	ET2004329-001	ET2004329-044	-----	-----	-----
				Result	Result	---	---	---
EP231P: PFAS Sums - Continued								
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	----	0.27	----	----	----
Sum of PFAS (WA DER List)	----	0.01	µg/L	----	0.40	----	----	----
Sum of PFAS	----	0.01	µg/L	0.75	----	----	----	----
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	0.26	----	----	----	----
Sum of PFAS (WA DER List)	----	0.01	µg/L	0.72	----	----	----	----
EP231S: PFAS Surrogate								
13C4-PFOS	----	0.02	%	107	----	----	----	----
13C4-PFOS	----	0.02	%	----	88.9	----	----	----
13C8-PFOA	----	0.02	%	101	----	----	----	----
13C8-PFOA	----	0.02	%	----	92.2	----	----	----



Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)				Sample ID	0229_SD203_201102	----	----	----
				Sampling date / time	02-Nov-2020 14:27	----	----	----
Compound	CAS Number	LOR	Unit	ET2004329-014				
				Result	----	----	----	----
EA055: Moisture Content (Dried @ 105-110°C)								
Moisture Content	----	0.1	%	20.7	----	----	----	----
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	<0.0002	----	----	----	----
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	----	----	----	----
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	----	----	----	----



Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)				Sample ID	0229_SD203_201102	----	----	----
Sampling date / time					02-Nov-2020 14:27	----	----	----
Compound	CAS Number	LOR	Unit		ET2004329-014	-----	-----	-----
					Result	----	----	----
EP231C: Perfluoroalkyl Sulfonamides - Continued								
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	%		84.5	----	----	----
13C8-PFOA	----	0.0002	%		110	----	----	----



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)		Sample ID		0229_SD217_201102	0229_QC107_201102	0229_SD233_201102	0229_SD205_201102
		Sampling date / time		02-Nov-2020 11:28	02-Nov-2020 11:28	02-Nov-2020 13:54	02-Nov-2020 15:17
Compound	CAS Number	LOR	Unit	ET2004329-004	ET2004329-005	ET2004329-012	ET2004329-016
				Result	Result	Result	Result
EA055: Moisture Content (Dried @ 105-110°C)							
Moisture Content	----	0.1	%	45.5	45.6	30.3	39.6
EP231A: Perfluoroalkyl Sulfonic Acids							
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0005	<0.0005	<0.0002	<0.0002
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0005	<0.0005	<0.0002	<0.0002
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0005	<0.0005	0.0002	<0.0002
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0005	<0.0005	<0.0002	<0.0002
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	0.0010	<0.0008	0.0020	<0.0002
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0005	<0.0005	<0.0002	<0.0002
EP231B: Perfluoroalkyl Carboxylic Acids							
Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.002	<0.002	<0.001	<0.001
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0005	<0.0005	<0.0002	<0.0002
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0005	<0.0005	<0.0002	<0.0002
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0005	<0.0005	<0.0002	<0.0002
Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0005	<0.0005	<0.0002	<0.0002
Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0005	<0.0005	<0.0002	<0.0002
Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0005	<0.0005	<0.0002	<0.0002
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0005	<0.0005	<0.0002	<0.0002
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0005	<0.0005	<0.0002	<0.0002
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0005	<0.0005	<0.0002	<0.0002
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0012	<0.0012	<0.0005	<0.0005
EP231C: Perfluoroalkyl Sulfonamides							
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0005	<0.0005	<0.0002	<0.0002
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0012	<0.0012	<0.0005	<0.0005



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	0229_SD217_201102	0229_QC107_201102	0229_SD233_201102	0229_SD205_201102
Sampling date / time				02-Nov-2020 11:28	02-Nov-2020 11:28		02-Nov-2020 13:54	02-Nov-2020 15:17
Compound	CAS Number	LOR	Unit	ET2004329-004	ET2004329-005		ET2004329-012	ET2004329-016
				Result	Result		Result	Result
EP231C: Perfluoroalkyl Sulfonamides - Continued								
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0012	<0.0012		<0.0005	<0.0005
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0012	<0.0012		<0.0005	<0.0005
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0012	<0.0012		<0.0005	<0.0005
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0005	<0.0005		<0.0002	<0.0002
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0005	<0.0005		<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	0.0010	<0.0005		0.0022	<0.0002
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg	0.0010	<0.0005		0.0022	<0.0002
Sum of PFAS (WA DER List)	----	0.0002	mg/kg	0.0010	<0.0005		0.0022	<0.0002
EP231S: PFAS Surrogate								
13C4-PFOS	----	0.0002	%	110	100		106	106
13C8-PFOA	----	0.0002	%	90.0	95.0		104	110



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	0229_SD220_201102	0229_SD243_201102	0229_SD232_201102	0229_SD242_201102	0229_SD227_201103
Sampling date / time				02-Nov-2020 15:51	02-Nov-2020 16:22	02-Nov-2020 16:45	02-Nov-2020 17:09	03-Nov-2020 14:30	
Compound	CAS Number	LOR	Unit	ET2004329-017	ET2004329-019	ET2004329-022	ET2004329-023	ET2004329-035	
				Result	Result	Result	Result	Result	
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content	----	0.1	%	25.9	26.4	51.4	29.4	32.0	
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	0.0025	<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	0.0130	<0.0002	0.0023	0.0010	<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	0.0003	<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	
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	0229_SD220_201102	0229_SD243_201102	0229_SD232_201102	0229_SD242_201102	0229_SD227_201103
Sampling date / time				02-Nov-2020 15:51	02-Nov-2020 16:22	02-Nov-2020 16:45	02-Nov-2020 17:09	03-Nov-2020 14:30	
Compound	CAS Number	LOR	Unit	ET2004329-017	ET2004329-019	ET2004329-022	ET2004329-023	ET2004329-035	
				Result	Result	Result	Result	Result	
EP231C: Perfluoroalkyl Sulfonamides - Continued									
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	0.0158	<0.0002	0.0025	0.0010	<0.0002	
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg	0.0155	<0.0002	0.0025	0.0010	<0.0002	
Sum of PFAS (WA DER List)	----	0.0002	mg/kg	0.0158	<0.0002	0.0025	0.0010	<0.0002	
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.0002	%	103	98.0	102	90.0	93.0	
13C8-PFOA	----	0.0002	%	98.0	112	100	106	109	



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)		Sample ID		0229_QC109_201103	0229_SD244_201103	0229_SD245_201103	----	----
		Sampling date / time		03-Nov-2020 15:36	03-Nov-2020 13:33	03-Nov-2020 11:40	----	----
Compound	CAS Number	LOR	Unit	ET2004329-036	ET2004329-037	ET2004329-038	-----	-----
				Result	Result	Result	----	----
EA055: Moisture Content (Dried @ 105-110°C)								
Moisture Content	----	0.1	%	17.6	18.1	40.9	----	----
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	----	----
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	----	----



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	0229_QC109_201103	0229_SD244_201103	0229_SD245_201103	----	----
Sampling date / time				03-Nov-2020 15:36	03-Nov-2020 13:33	03-Nov-2020 11:40	----	----	
Compound	CAS Number	LOR	Unit	ET2004329-036	ET2004329-037	ET2004329-038	-----	-----	
				Result	Result	Result	----	----	
EP231C: Perfluoroalkyl Sulfonamides - Continued									
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	%	102	93.0	90.0	----	----	
13C8-PFOA	----	0.0002	%	111	110	112	----	----	



Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID		0229_SW232_201102	0229_QC106_201102	----	----	----
				Sampling date / time		02-Nov-2020 16:44	02-Nov-2020 11:31	----	----	----
Compound	CAS Number	LOR	Unit	ET2004329-021		ET2004329-032		-----	-----	-----
				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	0.02	µg/L	<0.02	<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	0.09	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	----	----	----	----	----
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	<0.05	----	----	----	----	----



Analytical Results

Sub-Matrix: SURFACE WATER
 (Matrix: WATER)

Sample ID

				0229_SW232_201102	0229_QC106_201102	----	----	----
Sampling date / time				02-Nov-2020 16:44	02-Nov-2020 11:31	----	----	----
Compound	CAS Number	LOR	Unit	ET2004329-021	ET2004329-032	-----	-----	-----
				Result	Result	----	----	----
EP231C: Perfluoroalkyl Sulfonamides - Continued								
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	0.09	0.01	----	----	----
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	0.09	0.01	----	----	----
Sum of PFAS (WA DER List)	----	0.01	µg/L	0.09	0.01	----	----	----
EP231S: PFAS Surrogate								
13C4-PFOS	----	0.02	%	102	95.8	----	----	----
13C8-PFOA	----	0.02	%	98.8	96.3	----	----	----



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	0229_MW125_I_2011 02	0229_MW124_201102	0229_SW217_201102	0229_SW233_201102	0229_SW203_201102
Sampling date / time					02-Nov-2020 10:18	02-Nov-2020 10:30	02-Nov-2020 11:31	02-Nov-2020 13:53	02-Nov-2020 14:25
Compound	CAS Number	LOR	Unit	ET2004329-002	ET2004329-003	ET2004329-006	ET2004329-011	ET2004329-013	
				Result	Result	Result	Result	Result	
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05	
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05	
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02	
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02	
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05	
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	0.11	0.17	<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	0.42	0.18	<0.01	0.52	0.48	
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	0.21	0.01	<0.01	0.42	0.36	
Sum of PFAS (WA DER List)	----	0.01	µg/L	0.39	0.18	<0.01	0.50	0.46	
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%	103	106	101	99.2	94.9	
13C8-PFOA	----	0.02	%	101	103	105	96.7	99.6	



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	0229_SW205_201102	0229_SW220_201102	0229_SW243_201102	0229_SW242_201102	0229_QC302_201102
Sampling date / time				02-Nov-2020 15:16	02-Nov-2020 15:52	02-Nov-2020 16:19	02-Nov-2020 17:09	02-Nov-2020 17:15	
Compound	CAS Number	LOR	Unit	ET2004329-015	ET2004329-018	ET2004329-020	ET2004329-024	ET2004329-025	
				Result	Result	Result	Result	Result	
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.07	<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	0.02	µg/L	<0.02	0.37	<0.02	<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	0.02	0.45	0.01	0.06	<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	0.08	<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	0.02	<0.01	<0.01	<0.01	
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02	
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02	
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02	
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02	
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02	
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05	
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02	
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05	
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05	



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	0229_SW205_201102	0229_SW220_201102	0229_SW243_201102	0229_SW242_201102	0229_QC302_201102
Sampling date / time				02-Nov-2020 15:16	02-Nov-2020 15:52	02-Nov-2020 16:19	02-Nov-2020 17:09	02-Nov-2020 17:15	
Compound	CAS Number	LOR	Unit	ET2004329-015	ET2004329-018	ET2004329-020	ET2004329-024	ET2004329-025	
				Result	Result	Result	Result	Result	
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05	
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05	
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02	
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02	
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05	
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05	
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05	
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05	
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L	0.02	1.03	0.01	0.06	<0.01	
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	0.02	0.82	0.01	0.06	<0.01	
Sum of PFAS (WA DER List)	----	0.01	µg/L	0.02	0.99	0.01	0.06	<0.01	
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%	106	110	96.5	101	116	
13C8-PFOA	----	0.02	%	106	102	103	99.3	105	



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	0229_MW235_S_2011 03	0229_MW236_S_2011 03	0229_MW220_S_2011 03	0229_QC110_201103	0229_MW205_S_2011 03
Sampling date / time				03-Nov-2020 10:14	03-Nov-2020 10:50	03-Nov-2020 11:56	03-Nov-2020 11:57	03-Nov-2020 12:26	
Compound	CAS Number	LOR	Unit	ET2004329-026 Result	ET2004329-027 Result	ET2004329-028 Result	ET2004329-029 Result	ET2004329-030 Result	
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	----	0.06	----	----	----	
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	----	0.03	----	----	----	
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.02	µg/L	----	0.21	----	----	----	
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	----	<0.02	----	----	----	
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	----	0.16	----	----	----	
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	----	<0.02	----	----	----	
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	0.03	----	0.16	0.16	<0.02	
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	----	0.13	0.13	<0.02	
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.02	µg/L	<0.02	----	0.64	0.66	0.02	
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	0.02	----	0.04	0.04	0.02	
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	0.10	µg/L	----	<0.10	----	----	----	
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	----	----	----	



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	0229_MW235_S_2011 03	0229_MW236_S_2011 03	0229_MW220_S_2011 03	0229_QC110_201103	0229_MW205_S_2011 03
Sampling date / time				03-Nov-2020 10:14	03-Nov-2020 10:50	03-Nov-2020 11:56	03-Nov-2020 11:57	03-Nov-2020 12:26	
Compound	CAS Number	LOR	Unit	ET2004329-026 Result	ET2004329-027 Result	ET2004329-028 Result	ET2004329-029 Result	ET2004329-030 Result	
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	----	<0.02	----	----	----	
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	----	<0.05	----	----	----	
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	----	0.03	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	----	----	----	
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	----	----	----	



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	0229_MW235_S_2011 03	0229_MW236_S_2011 03	0229_MW220_S_2011 03	0229_QC110_201103	0229_MW205_S_2011 03
Sampling date / time				03-Nov-2020 10:14	03-Nov-2020 10:50	03-Nov-2020 11:56	03-Nov-2020 11:57	03-Nov-2020 12:26	
Compound	CAS Number	LOR	Unit	ET2004329-026	ET2004329-027	ET2004329-028	ET2004329-029	ET2004329-030	
				Result	Result	Result	Result	Result	
EP231C: Perfluoroalkyl Sulfonamides - Continued									
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									
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	----	----	----	
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	----	0.32	0.28	<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	----	0.49	----	----	----	



Analytical Results

Sub-Matrix: WATER
 (Matrix: WATER)

Sample ID

				0229_MW235_S_2011 03	0229_MW236_S_2011 03	0229_MW220_S_2011 03	0229_QC110_201103	0229_MW205_S_2011 03
Sampling date / time				03-Nov-2020 10:14	03-Nov-2020 10:50	03-Nov-2020 11:56	03-Nov-2020 11:57	03-Nov-2020 12:26
Compound	CAS Number	LOR	Unit	ET2004329-026	ET2004329-027	ET2004329-028	ET2004329-029	ET2004329-030
				Result	Result	Result	Result	Result
EP231P: PFAS Sums - Continued								
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	----	0.37	----	----	----
Sum of PFAS (WA DER List)	----	0.01	µg/L	----	0.46	----	----	----
Sum of PFAS	----	0.01	µg/L	0.05	----	1.32	1.29	0.04
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	0.02	----	0.68	0.70	0.04
Sum of PFAS (WA DER List)	----	0.01	µg/L	0.05	----	1.19	1.16	0.04
EP231S: PFAS Surrogate								
13C4-PFOS	----	0.02	%	94.6	----	105	97.4	103
13C4-PFOS	----	0.02	%	----	96.4	----	----	----
13C8-PFOA	----	0.02	%	97.1	----	98.6	95.9	96.8
13C8-PFOA	----	0.02	%	----	98.2	----	----	----



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	0229_MW233_201103	0229_MW212_201103	0229_MW217_201103	0229_SW227_201103	0229_SW244_201103
Sampling date / time					03-Nov-2020 12:51	03-Nov-2020 13:35	03-Nov-2020 13:59	03-Nov-2020 14:45	03-Nov-2020 13:30
Compound	CAS Number	LOR	Unit	ET2004329-031	ET2004329-033	ET2004329-034	ET2004329-039	ET2004329-040	
				Result	Result	Result	Result	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	0.02	µg/L	----	----	<0.02	----	----	
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	----	----	<0.02	----	----	
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	----	----	<0.02	----	----	
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	----	----	<0.02	----	----	
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	0.02	µg/L	<0.02	<0.02	----	<0.02	<0.02	
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	0.10	µg/L	----	----	<0.10	----	----	
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	----	----	<0.02	----	----	
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	----	----	



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	0229_MW233_201103	0229_MW212_201103	0229_MW217_201103	0229_SW227_201103	0229_SW244_201103
Sampling date / time					03-Nov-2020 12:51	03-Nov-2020 13:35	03-Nov-2020 13:59	03-Nov-2020 14:45	03-Nov-2020 13:30
Compound	CAS Number	LOR	Unit	ET2004329-031	ET2004329-033	ET2004329-034	ET2004329-039	ET2004329-040	
				Result	Result	Result	Result	Result	
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	----	----	<0.02	----	----	
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	----	----	<0.05	----	----	
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	----	----	
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	----	----	



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	0229_MW233_201103	0229_MW212_201103	0229_MW217_201103	0229_SW227_201103	0229_SW244_201103
Sampling date / time				03-Nov-2020 12:51	03-Nov-2020 13:35	03-Nov-2020 13:59	03-Nov-2020 14:45	03-Nov-2020 13:30	
Compound	CAS Number	LOR	Unit	ET2004329-031	ET2004329-033	ET2004329-034	ET2004329-039	ET2004329-040	
				Result	Result	Result	Result	Result	
EP231C: Perfluoroalkyl Sulfonamides - Continued									
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									
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	----	----	
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	0.15	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	
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	----	----	<0.02	----	----	



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	0229_MW233_201103	0229_MW212_201103	0229_MW217_201103	0229_SW227_201103	0229_SW244_201103
Sampling date / time					03-Nov-2020 12:51	03-Nov-2020 13:35	03-Nov-2020 13:59	03-Nov-2020 14:45	03-Nov-2020 13:30
Compound	CAS Number	LOR	Unit		ET2004329-031	ET2004329-033	ET2004329-034	ET2004329-039	ET2004329-040
					Result	Result	Result	Result	Result
EP231P: PFAS Sums - Continued									
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	----	----		<0.02	----	----
Sum of PFAS (WA DER List)	----	0.01	µg/L	----	----		<0.02	----	----
Sum of PFAS	----	0.01	µg/L	0.15	0.06		----	<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	0.15	0.06		----	<0.01	<0.01
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%	96.4	104		----	94.1	98.8
13C4-PFOS	----	0.02	%	----	----		91.3	----	----
13C8-PFOA	----	0.02	%	98.4	99.3		----	96.4	97.6
13C8-PFOA	----	0.02	%	----	----		99.2	----	----



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	0229_SW245_201103	0229_QC108_201103	0229_QC303_201103	----	----
				Sampling date / time	03-Nov-2020 09:30	03-Nov-2020 15:42	03-Nov-2020 16:15	----	----
Compound	CAS Number	LOR	Unit	ET2004329-041	ET2004329-042	ET2004329-043	-----	-----	
				Result	Result	Result	----	----	
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	<0.02	<0.02	----	----	
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	<0.02	<0.02	----	----	
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.02	µg/L	<0.02	<0.02	<0.02	----	----	
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	<0.02	<0.02	----	----	
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	<0.01	<0.01	----	----	
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	<0.02	<0.02	----	----	
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	<0.1	<0.1	----	----	
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	<0.02	<0.02	----	----	
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	<0.02	<0.02	----	----	
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	<0.02	<0.02	----	----	
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	<0.01	<0.01	----	----	
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	<0.02	<0.02	----	----	
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	<0.02	<0.02	----	----	
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	<0.02	<0.02	----	----	
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	<0.02	<0.02	----	----	
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	<0.02	<0.02	----	----	
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	<0.05	<0.05	----	----	
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	<0.02	<0.02	----	----	
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	<0.05	<0.05	----	----	
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	<0.05	<0.05	----	----	



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	0229_SW245_201103	0229_QC108_201103	0229_QC303_201103	----	----
Sampling date / time				03-Nov-2020 09:30	03-Nov-2020 15:42	03-Nov-2020 16:15	----	----	
Compound	CAS Number	LOR	Unit	ET2004329-041	ET2004329-042	ET2004329-043	-----	-----	
				Result	Result	Result	----	----	
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	<0.05	<0.05	----	----	
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	<0.05	<0.05	----	----	
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	<0.02	<0.02	----	----	
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	<0.02	<0.02	----	----	
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	<0.05	<0.05	----	----	
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	<0.05	<0.05	----	----	
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	<0.05	<0.05	----	----	
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	<0.05	<0.05	----	----	
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L	<0.01	<0.01	<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	%	99.3	92.7	94.0	----	----	
13C8-PFOA	----	0.02	%	97.7	99.0	100	----	----	



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

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

Sub-Matrix: SURFACE WATER		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 : **ET2004329**
Amendment : **2**

Page : 1 of 14

Client : **AECOM Australia Pty Ltd**

Laboratory : Environmental Division Townsville

Contact : [REDACTED]

Contact : [REDACTED]

Address : [REDACTED]

Address : [REDACTED]

Telephone : ----

Telephone : [REDACTED]

Project : QLD_0229_PFASOMP_20

Date Samples Received : 03-Nov-2020

Order number : 60612487_3.1

Date Analysis Commenced : 05-Nov-2020

C-O-C number : 15443

Issue Date : 02-Dec-2020

Sampler : [REDACTED]

Site : QLD_0229

Quote number : TV/123/20

No. of samples received : 44

No. of samples analysed : 42



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]	[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]	[REDACTED]



General Comments

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

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

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

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 (%)	Recovery Limits (%)
EA055: Moisture Content (Dried @ 105-110°C) (QC Lot: 3347653)									
ET2004329-004	0229_SD217_201102	EA055: Moisture Content	----	0.1	%	45.5	43.3	4.96	0% - 20%
ET2004329-023	0229_SD242_201102	EA055: Moisture Content	----	0.1	%	29.4	30.3	2.85	0% - 20%
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 3347652)									
ET2004329-004	0229_SD217_201102	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0005	<0.0005	0.00	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0005	<0.0005	0.00	No Limit
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0005	<0.0005	0.00	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0005	<0.0005	0.00	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	0.0010	0.0008	20.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0005	<0.0005	0.00	No Limit
ET2004329-023	0229_SD242_201102	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	<0.0002	0.00	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	<0.0002	0.00	No Limit
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	<0.0002	0.00	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	<0.0002	0.00	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	0.0010	0.0012	13.6	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	<0.0002	0.00	No Limit
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 3347652)									
ET2004329-004	0229_SD217_201102	EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0005	<0.0005	0.00	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0005	<0.0005	0.00	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0005	<0.0005	0.00	No Limit
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0005	<0.0005	0.00	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0005	<0.0005	0.00	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0005	<0.0005	0.00	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0005	<0.0005	0.00	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0005	<0.0005	0.00	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 (%)	Recovery Limits (%)
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 3347652) - continued									
ET2004329-004	0229_SD217_201102	EP231X: Perfluorotridecanoic acid (PFTTrDA)	72629-94-8	0.0002	mg/kg	<0.0005	<0.0005	0.00	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0012	<0.0012	0.00	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.002	<0.002	0.00	No Limit
ET2004329-023	0229_SD242_201102	EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	<0.0002	0.00	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	<0.0002	0.00	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	<0.0002	0.00	No Limit
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	<0.0002	0.00	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	<0.0002	0.00	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	<0.0002	0.00	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.00	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	<0.0002	0.00	No Limit
		EP231X: Perfluorotridecanoic acid (PFTTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.00	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	<0.0005	0.00	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	<0.001	0.00	No Limit
		EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 3347652)							
ET2004329-004	0229_SD217_201102	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0005	<0.0005	0.00	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0005	<0.0005	0.00	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0005	<0.0005	0.00	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0012	<0.0012	0.00	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0012	<0.0012	0.00	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0012	<0.0012	0.00	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0012	<0.0012	0.00	No Limit
ET2004329-023	0229_SD242_201102	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	<0.0002	0.00	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	<0.0002	0.00	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	<0.0002	0.00	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	<0.0005	0.00	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	<0.0005	0.00	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	<0.0005	0.00	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	<0.0005	0.00	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 (%)	Recovery Limits (%)
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 3347652)									
ET2004329-004	0229_SD217_201102	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	<0.0005	0.00	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	<0.0005	0.00	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	<0.0005	0.00	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	<0.0005	0.00	No Limit
ET2004329-023	0229_SD242_201102	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	<0.0005	0.00	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	<0.0005	0.00	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	<0.0005	0.00	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	<0.0005	0.00	No Limit
Sub-Matrix: WATER									
Sub-Matrix: WATER				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 3348368)									
ET2004329-003	0229_MW124_201102	EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	0.01	0.01	0.00	No Limit
		EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	<0.02	0.00	No Limit
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 3354604)									
ET2004329-027	0229_MW236_S_201103	EP231X-INJ: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	0.16	0.17	8.59	0% - 50%
		EP231X-INJ: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	0.06	0.06	0.00	No Limit
		EP231X-INJ: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	0.03	0.03	0.00	No Limit
		EP231X-INJ: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.02	µg/L	0.21	0.23	12.7	0% - 50%
		EP231X-INJ: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X-INJ: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	<0.02	0.00	No Limit
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 3348368)									
ET2004329-003	0229_MW124_201102	EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	<0.01	0.00	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 (%)	Recovery Limits (%)		
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 3348368) - continued											
ET2004329-003	0229_MW124_201102	EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	<0.02	0.00	No Limit		
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	<0.02	0.00	No Limit		
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	<0.02	0.00	No Limit		
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	<0.02	0.00	No Limit		
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	<0.02	0.00	No Limit		
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	<0.02	0.00	No Limit		
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	<0.02	0.00	No Limit		
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	<0.02	0.00	No Limit		
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	<0.05	0.00	No Limit		
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	<0.1	0.00	No Limit				
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 3354604)											
ET2004329-027	0229_MW236_S_201103	EP231X-INJ: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	0.01	0.02	0.00	No Limit		
		EP231X-INJ: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	<0.02	0.00	No Limit		
		EP231X-INJ: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	0.02	0.03	0.00	No Limit		
		EP231X-INJ: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	<0.02	0.00	No Limit		
		EP231X-INJ: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	<0.02	0.00	No Limit		
		EP231X-INJ: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	<0.02	0.00	No Limit		
		EP231X-INJ: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	<0.02	0.00	No Limit		
		EP231X-INJ: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	<0.02	0.00	No Limit		
		EP231X-INJ: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	<0.02	0.00	No Limit		
		EP231X-INJ: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	<0.05	0.00	No Limit		
		EP231X-INJ: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.10	<0.10	0.00	No Limit		
		EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 3348368)									
		ET2004329-003	0229_MW124_201102	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	<0.02	0.00	No Limit
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9			0.02	µg/L	<0.02	<0.02	0.00	No Limit		
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6			0.02	µg/L	<0.02	<0.02	0.00	No Limit		
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8			0.05	µg/L	<0.05	<0.05	0.00	No Limit		
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2			0.05	µg/L	<0.05	<0.05	0.00	No Limit		
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7			0.05	µg/L	<0.05	<0.05	0.00	No Limit		
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2			0.05	µg/L	<0.05	<0.05	0.00	No Limit		
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 3354604)											
ET2004329-027	0229_MW236_S_201103	EP231X-INJ: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	<0.02	0.00	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 (%)	Recovery Limits (%)
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 3354604) - continued									
ET2004329-027	0229_MW236_S_201103	EP231X-INJ: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X-INJ: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X-INJ: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	<0.05	0.00	No Limit
		EP231X-INJ: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	<0.05	0.00	No Limit
		EP231X-INJ: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	<0.05	0.00	No Limit
		EP231X-INJ: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	<0.05	0.00	No Limit
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 3348368)									
ET2004329-003	0229_MW124_201102	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	<0.05	0.00	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	0.17	0.17	0.00	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	<0.05	0.00	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	<0.05	0.00	No Limit
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 3354604)									
ET2004329-027	0229_MW236_S_201103	EP231X-INJ: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	<0.05	0.00	No Limit
		EP231X-INJ: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	<0.05	0.00	No Limit
		EP231X-INJ: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	<0.05	0.00	No Limit
		EP231X-INJ: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	<0.05	0.00	No Limit
EP231P: PFAS Sums (QC Lot: 3348368)									
ET2004329-003	0229_MW124_201102	EP231X: Sum of PFAS	----	0.01	µg/L	0.18	0.18	0.00	0% - 50%
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	0.01	0.01	0.00	No Limit
		EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	0.18	0.18	0.00	0% - 50%
EP231P: PFAS Sums (QC Lot: 3354604)									
ET2004329-027	0229_MW236_S_201103	EP231X-INJ: Sum of PFAS	----	0.01	µg/L	0.49	0.54	9.71	0% - 20%
		EP231X-INJ: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	0.37	0.40	7.79	0% - 20%
		EP231X-INJ: Sum of PFAS (WA DER List)	----	0.01	µg/L	0.46	0.51	10.3	0% - 20%



Method Blank (MB) and Laboratory Control Spike (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 Spike (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: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report				
				Result	Spike Concentration	Spike Recovery (%)		Recovery Limits (%)	
						LCS	Low	High	
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 3347652)									
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	0.0011 mg/kg	90.4	72.0	128	
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	0.00117 mg/kg	97.0	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	104	70.0	132	
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	0.00116 mg/kg	106	68.0	136	
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	0.0012 mg/kg	104	59.0	134	
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 3347652)									
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	0.00625 mg/kg	96.1	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	93.2	70.0	132	
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	0.00125 mg/kg	90.4	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	99.2	72.0	129	
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	0.00125 mg/kg	99.2	69.0	133	
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	111	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	99.2	66.0	139	
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	0.00312 mg/kg	116	69.0	133	
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 3347652)									
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	0.00125 mg/kg	113	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	121	62.8	140	
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	0.00312 mg/kg	91.3	61.5	139	
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	0.00312 mg/kg	106	61.9	137	
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	89.2	61.0	139	
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 3347652)									
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	104	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	83.8	65.0	137	



Sub-Matrix: **SOIL**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report Result	Laboratory Control Spike (LCS) Report				
					Spike Concentration	Spike Recovery (%)		Recovery Limits (%)	
						LCS	Low	High	
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 3347652) - continued									
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	0.0012 mg/kg	115	54.8	124	

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report Result	Laboratory Control Spike (LCS) Report				
					Spike Concentration	Spike Recovery (%)		Recovery Limits (%)	
						LCS	Low	High	
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 3348368)									
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.2218 µg/L	80.7	72.0	130	
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.2352 µg/L	92.0	71.0	127	
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.02	µg/L	<0.02	0.2373 µg/L	83.2	68.0	131	
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.238 µg/L	94.7	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	99.4	53.0	142	
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 3348369)									
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.2218 µg/L	82.0	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	0.02	µg/L	<0.02	0.2373 µg/L	86.6	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	98.7	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: 3354604)									
EP231X-INJ: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.444 µg/L	106	72.0	130	
EP231X-INJ: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.47 µg/L	108	71.0	127	
EP231X-INJ: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.02	µg/L	<0.02	0.475 µg/L	106	68.0	131	
EP231X-INJ: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.477 µg/L	111	69.0	134	
EP231X-INJ: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.4646 µg/L	110	65.0	140	
EP231X-INJ: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.5 µg/L	109	53.0	142	
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 3348368)									
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	85.4	72.0	129	
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	0.25 µg/L	87.8	72.0	129	
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	0.25 µg/L	83.6	72.0	130	
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	0.25 µg/L	86.8	71.0	133	
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	0.25 µg/L	87.6	69.0	130	
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	0.25 µg/L	90.4	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	95.6	72.0	134	
EP231X: Perfluorotridecanoic acid (PFTriDA)	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	0.625 µg/L	99.5	71.0	132	
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 3348369)									



Sub-Matrix: WATER

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report				
				Result	Spike	Spike Recovery (%)		Recovery Limits (%)	
					Concentration	LCS	Low	High	
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 3348369) - continued									
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	1.25 µg/L	98.6	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	85.0	72.0	129	
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	0.25 µg/L	87.0	72.0	130	
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	0.25 µg/L	90.6	71.0	133	
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	0.25 µg/L	94.4	69.0	130	
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	0.25 µg/L	92.8	71.0	129	
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	0.25 µg/L	106	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	82.8	65.0	144	
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	0.625 µg/L	105	71.0	132	
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 3354604)									
EP231X-INJ: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.10	2.5 µg/L	105	73.0	129	
EP231X-INJ: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	0.5 µg/L	104	72.0	129	
EP231X-INJ: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	0.5 µg/L	102	72.0	129	
EP231X-INJ: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	0.5 µg/L	106	72.0	130	
EP231X-INJ: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	0.5 µg/L	107	71.0	133	
EP231X-INJ: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	0.5 µg/L	104	69.0	130	
EP231X-INJ: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	0.5 µg/L	112	71.0	129	
EP231X-INJ: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	0.5 µg/L	108	69.0	133	
EP231X-INJ: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	0.5 µg/L	104	72.0	134	
EP231X-INJ: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	0.5 µg/L	99.6	65.0	144	
EP231X-INJ: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	1.25 µg/L	106	71.0	132	
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 3348368)									
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.25 µg/L	120	67.0	137	
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	0.625 µg/L	90.2	68.0	141	
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	0.625 µg/L	99.8	60.5	138	
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	0.625 µg/L	83.1	68.3	134	
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	0.625 µg/L	89.9	62.6	138	
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	0.25 µg/L	94.2	65.0	136	
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	0.25 µg/L	78.2	61.0	135	
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 3348369)									
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.25 µg/L	101	67.0	137	
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	0.625 µg/L	81.8	68.0	141	
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	0.625 µg/L	82.3	60.5	138	



Sub-Matrix: WATER

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report				
				Result	Spike Concentration	Spike Recovery (%)		Recovery Limits (%)	
					LCS	Low	High		
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 3348369) - continued									
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	0.625 µg/L	81.9	68.3	134	
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	0.625 µg/L	87.4	62.6	138	
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	0.25 µg/L	100	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	
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 3354604)									
EP231X-INJ: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.5 µg/L	110	67.0	137	
EP231X-INJ: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	1.25 µg/L	116	68.0	141	
EP231X-INJ: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	1.25 µg/L	108	62.1	136	
EP231X-INJ: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	1.25 µg/L	118	65.2	135	
EP231X-INJ: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	1.25 µg/L	111	63.2	135	
EP231X-INJ: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	0.5 µg/L	105	65.0	136	
EP231X-INJ: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	0.5 µg/L	97.4	61.0	135	
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 3348368)									
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	85.8	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	74.8	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	94.8	64.2	133	
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 3348369)									
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	90.8	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	72.9	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	79.0	64.2	133	
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 3354604)									
EP231X-INJ: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.469 µg/L	106	63.0	143	
EP231X-INJ: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	0.476 µg/L	108	64.0	140	
EP231X-INJ: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	0.48 µg/L	126	67.0	138	
EP231X-INJ: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	0.483 µg/L	100	62.2	139	
EP231P: PFAS Sums (QCLot: 3348368)									
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 (%)	Recovery Limits (%)	
						LCS	Low	High
EP231P: PFAS Sums (QCLot: 3348368) - 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: 3348369)								
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: 3354604)								
EP231X-INJ: Sum of PFAS	----	0.01	µg/L	<0.01	----	----	----	----
EP231X-INJ: Sum of PFHxS and PFOS	355-46-4/17 63-23-1	0.01	µg/L	<0.01	----	----	----	----
EP231X-INJ: 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: **SOIL**

Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report			
				Spike Concentration	Spike Recovery(%) MS	Recovery Limits (%)	
						Low	High
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 3347652)							
ET2004329-005	0229_QC107_201102	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0011 mg/kg	# Not Determined	72.0	128
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.00117 mg/kg	# Not Determined	73.0	123
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.00118 mg/kg	# Not Determined	67.0	130
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.00119 mg/kg	# Not Determined	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	# Not Determined	59.0	134
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 3347652)							
ET2004329-005	0229_QC107_201102	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.00625 mg/kg	# Not Determined	71.0	135
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.00125 mg/kg	# Not Determined	69.0	132



Sub-Matrix: SOIL

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Recovery Limits (%)	
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 3347652) - continued							
ET2004329-005	0229_QC107_201102	EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.00125 mg/kg	# Not Determined	70.0	132
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.00125 mg/kg	# Not Determined	71.0	131
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.00125 mg/kg	# Not Determined	69.0	133
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.00125 mg/kg	# Not Determined	72.0	129
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.00125 mg/kg	# Not Determined	69.0	133
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.00125 mg/kg	# Not Determined	64.0	136
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.00125 mg/kg	# Not Determined	69.0	135
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.00125 mg/kg	# Not Determined	66.0	139
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.00312 mg/kg	# Not Determined	69.0	133
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 3347652)							
ET2004329-005	0229_QC107_201102	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.00125 mg/kg	# Not Determined	48.0	128
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.00312 mg/kg	# Not Determined	70.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.00312 mg/kg	# Not Determined	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.00312 mg/kg	# Not Determined	70.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.00312 mg/kg	# Not Determined	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.00125 mg/kg	# Not Determined	63.0	144
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.00125 mg/kg	# Not Determined	61.0	139
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 3347652)							
ET2004329-005	0229_QC107_201102	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.00117 mg/kg	# Not Determined	62.0	145
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.00118 mg/kg	# Not Determined	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0012 mg/kg	# Not Determined	65.0	137



Sub-Matrix: **SOIL**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Recovery Limits (%)	
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 3347652) - continued							
ET2004329-005	0229_QC107_201102	EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0012 mg/kg	# Not Determined	70.0	130

Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Recovery Limits (%)	
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 3354604)							
ET2004329-034	0229_MW217_201103	EP231X-INJ: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.443 µg/L	106	70.0	130
		EP231X-INJ: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.47 µg/L	104	70.0	130
		EP231X-INJ: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.475 µg/L	108	70.0	130
		EP231X-INJ: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.477 µg/L	114	70.0	130
		EP231X-INJ: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.5 µg/L	97.2	70.0	130
		EP231X-INJ: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.482 µg/L	108	70.0	130
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 3354604)							
ET2004329-034	0229_MW217_201103	EP231X-INJ: Perfluorobutanoic acid (PFBA)	375-22-4	2.5 µg/L	107	70.0	130
		EP231X-INJ: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.5 µg/L	106	70.0	130
		EP231X-INJ: Perfluorohexanoic acid (PFHxA)	307-24-4	0.5 µg/L	108	70.0	130
		EP231X-INJ: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.5 µg/L	106	70.0	130
		EP231X-INJ: Perfluorooctanoic acid (PFOA)	335-67-1	0.5 µg/L	110	70.0	130
		EP231X-INJ: Perfluorononanoic acid (PFNA)	375-95-1	0.5 µg/L	110	70.0	130
		EP231X-INJ: Perfluorodecanoic acid (PFDA)	335-76-2	0.5 µg/L	109	70.0	130
		EP231X-INJ: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.5 µg/L	109	70.0	130
		EP231X-INJ: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.5 µg/L	110	70.0	130
		EP231X-INJ: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.5 µg/L	102	70.0	130
		EP231X-INJ: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	1.25 µg/L	110	70.0	130
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 3354604)							
ET2004329-034	0229_MW217_201103	EP231X-INJ: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.5 µg/L	106	70.0	130
		EP231X-INJ: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	1.25 µg/L	123	70.0	130
		EP231X-INJ: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	1.25 µg/L	104	70.0	130
		EP231X-INJ: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	1.25 µg/L	112	70.0	130
		EP231X-INJ: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	1.25 µg/L	104	70.0	130
		EP231X-INJ: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.5 µg/L	103	70.0	130
		EP231X-INJ: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.5 µg/L	103	70.0	130



Sub-Matrix: **WATER**

				<i>Matrix Spike (MS) Report</i>			
				<i>Spike</i>	<i>SpikeRecovery(%)</i>	<i>Recovery Limits (%)</i>	
<i>Laboratory sample ID</i>	<i>Sample ID</i>	<i>Method: Compound</i>	<i>CAS Number</i>	<i>Concentration</i>	<i>MS</i>	<i>Low</i>	<i>High</i>
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 3354604)							
ET2004329-034	0229_MW217_201103	EP231X-INJ: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.468 µg/L	108	70.0	130
		EP231X-INJ: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.475 µg/L	118	70.0	130
		EP231X-INJ: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.48 µg/L	117	70.0	130
		EP231X-INJ: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.483 µg/L	129	70.0	130

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: ET2004329	Page	: 1 of 8
Amendment	: 2		
Client	: AECOM Australia Pty Ltd	Laboratory	: Environmental Division Townsville
Contact	: [REDACTED]	Telephone	: [REDACTED]
Project	: QLD_0229_PFASOMP_20	Date Samples Received	: 03-Nov-2020
Site	: QLD_0229	Issue Date	: 02-Dec-2020
Sampler	: [REDACTED]	No. of samples received	: 44
Order number	: 60612487_3.1	No. of samples analysed	: 42

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

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

Summary of Outliers

Outliers : Quality Control Samples

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

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

Outliers : Analysis Holding Time Compliance

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

Outliers : Frequency of Quality Control Samples

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



Outliers : Frequency of Quality Control Samples

Matrix: **WATER**

Quality Control Sample Type Method	Count		Rate (%)		Quality Control Specification
	QC	Regular	Actual	Expected	
Laboratory Duplicates (DUP)					
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	1	24	4.17	10.00	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)					
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	0	24	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: **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) 0229_SD217_201102, 0229_SD211_201102, 0229_SD233_201102, 0229_SD205_201102, 0229_SD243_201102, 0229_SD242_201102	0229_QC107_201102, 0229_SD212_201102, 0229_SD203_201102, 0229_SD220_201102, 0229_SD232_201102,	02-Nov-2020	----	----	----	05-Nov-2020	16-Nov-2020	✔
HDPE Soil Jar (EA055) 0229_SD227_201103, 0229_SD244_201103,	0229_QC109_201103, 0229_SD245_201103	03-Nov-2020	----	----	----	05-Nov-2020	17-Nov-2020	✔
EP231A: Perfluoroalkyl Sulfonic Acids								
HDPE Soil Jar (EP231X) 0229_SD217_201102, 0229_SD211_201102, 0229_SD233_201102, 0229_SD205_201102, 0229_SD243_201102, 0229_SD242_201102	0229_QC107_201102, 0229_SD212_201102, 0229_SD203_201102, 0229_SD220_201102, 0229_SD232_201102,	02-Nov-2020	09-Nov-2020	01-May-2021	✔	09-Nov-2020	19-Dec-2020	✔
HDPE Soil Jar (EP231X) 0229_SD227_201103, 0229_SD244_201103,	0229_QC109_201103, 0229_SD245_201103	03-Nov-2020	09-Nov-2020	02-May-2021	✔	09-Nov-2020	19-Dec-2020	✔



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	
EP231B: Perfluoroalkyl Carboxylic Acids								
HDPE Soil Jar (EP231X) 0229_SD217_201102, 0229_SD211_201102, 0229_SD233_201102, 0229_SD205_201102, 0229_SD243_201102, 0229_SD242_201102,	0229_QC107_201102, 0229_SD212_201102, 0229_SD203_201102, 0229_SD220_201102, 0229_SD232_201102,	02-Nov-2020	09-Nov-2020	01-May-2021	✓	09-Nov-2020	19-Dec-2020	✓
HDPE Soil Jar (EP231X) 0229_SD227_201103, 0229_SD244_201103,	0229_QC109_201103, 0229_SD245_201103	03-Nov-2020	09-Nov-2020	02-May-2021	✓	09-Nov-2020	19-Dec-2020	✓
EP231C: Perfluoroalkyl Sulfonamides								
HDPE Soil Jar (EP231X) 0229_SD217_201102, 0229_SD211_201102, 0229_SD233_201102, 0229_SD205_201102, 0229_SD243_201102, 0229_SD242_201102,	0229_QC107_201102, 0229_SD212_201102, 0229_SD203_201102, 0229_SD220_201102, 0229_SD232_201102,	02-Nov-2020	09-Nov-2020	01-May-2021	✓	09-Nov-2020	19-Dec-2020	✓
HDPE Soil Jar (EP231X) 0229_SD227_201103, 0229_SD244_201103,	0229_QC109_201103, 0229_SD245_201103	03-Nov-2020	09-Nov-2020	02-May-2021	✓	09-Nov-2020	19-Dec-2020	✓
EP231D: (n:2) Fluorotelomer Sulfonic Acids								
HDPE Soil Jar (EP231X) 0229_SD217_201102, 0229_SD211_201102, 0229_SD233_201102, 0229_SD205_201102, 0229_SD243_201102, 0229_SD242_201102,	0229_QC107_201102, 0229_SD212_201102, 0229_SD203_201102, 0229_SD220_201102, 0229_SD232_201102,	02-Nov-2020	09-Nov-2020	01-May-2021	✓	09-Nov-2020	19-Dec-2020	✓
HDPE Soil Jar (EP231X) 0229_SD227_201103, 0229_SD244_201103,	0229_QC109_201103, 0229_SD245_201103	03-Nov-2020	09-Nov-2020	02-May-2021	✓	09-Nov-2020	19-Dec-2020	✓



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) 0229_SD217_201102, 0229_SD211_201102, 0229_SD233_201102, 0229_SD205_201102, 0229_SD243_201102, 0229_SD242_201102,	0229_QC107_201102, 0229_SD212_201102, 0229_SD203_201102, 0229_SD220_201102, 0229_SD232_201102,	02-Nov-2020	09-Nov-2020	01-May-2021	✓	09-Nov-2020	19-Dec-2020	✓
HDPE Soil Jar (EP231X) 0229_SD227_201103, 0229_SD244_201103,	0229_QC109_201103, 0229_SD245_201103	03-Nov-2020	09-Nov-2020	02-May-2021	✓	09-Nov-2020	19-Dec-2020	✓

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) 0229_MW125_S_201102, 0229_MW124_201102, 0229_SW233_201102, 0229_SW205_201102, 0229_SW243_201102, 0229_SW242_201102,	0229_MW125_I_201102, 0229_SW217_201102, 0229_SW203_201102, 0229_SW220_201102, 0229_SW232_201102, 0229_QC302_201102	02-Nov-2020	09-Nov-2020	01-May-2021	✓	09-Nov-2020	01-May-2021	✓
HDPE (no PTFE) (EP231X) 0229_QC106_201102		02-Nov-2020	10-Nov-2020	01-May-2021	✓	10-Nov-2020	01-May-2021	✓
HDPE (no PTFE) (EP231X-INJ) 0229_MW235_S_201103, 0229_MW220_S_201103, 0229_MW205_S_201103, 0229_MW212_201103, 0229_SW227_201103, 0229_SW245_201103, 0229_QC303_201103,	0229_MW236_S_201103, 0229_QC110_201103, 0229_MW233_201103, 0229_MW217_201103, 0229_SW244_201103, 0229_QC108_201103, 0229_MW232_201103	03-Nov-2020	10-Nov-2020	02-May-2021	✓	10-Nov-2020	02-May-2021	✓



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) 0229_MW125_S_201102, 0229_MW124_201102, 0229_SW233_201102, 0229_SW205_201102, 0229_SW243_201102, 0229_SW242_201102,	0229_MW125_I_201102, 0229_SW217_201102, 0229_SW203_201102, 0229_SW220_201102, 0229_SW232_201102, 0229_QC302_201102	02-Nov-2020	09-Nov-2020	01-May-2021	✓	09-Nov-2020	01-May-2021	✓
HDPE (no PTFE) (EP231X) 0229_QC106_201102		02-Nov-2020	10-Nov-2020	01-May-2021	✓	10-Nov-2020	01-May-2021	✓
HDPE (no PTFE) (EP231X-INJ) 0229_MW235_S_201103, 0229_MW220_S_201103, 0229_MW205_S_201103, 0229_MW212_201103, 0229_SW227_201103, 0229_SW245_201103, 0229_QC303_201103,	0229_MW236_S_201103, 0229_QC110_201103, 0229_MW233_201103, 0229_MW217_201103, 0229_SW244_201103, 0229_QC108_201103, 0229_MW232_201103	03-Nov-2020	10-Nov-2020	02-May-2021	✓	10-Nov-2020	02-May-2021	✓
EP231C: Perfluoroalkyl Sulfonamides								
HDPE (no PTFE) (EP231X) 0229_MW125_S_201102, 0229_MW124_201102, 0229_SW233_201102, 0229_SW205_201102, 0229_SW243_201102, 0229_SW242_201102,	0229_MW125_I_201102, 0229_SW217_201102, 0229_SW203_201102, 0229_SW220_201102, 0229_SW232_201102, 0229_QC302_201102	02-Nov-2020	09-Nov-2020	01-May-2021	✓	09-Nov-2020	01-May-2021	✓
HDPE (no PTFE) (EP231X) 0229_QC106_201102		02-Nov-2020	10-Nov-2020	01-May-2021	✓	10-Nov-2020	01-May-2021	✓
HDPE (no PTFE) (EP231X-INJ) 0229_MW235_S_201103, 0229_MW220_S_201103, 0229_MW205_S_201103, 0229_MW212_201103, 0229_SW227_201103, 0229_SW245_201103, 0229_QC303_201103,	0229_MW236_S_201103, 0229_QC110_201103, 0229_MW233_201103, 0229_MW217_201103, 0229_SW244_201103, 0229_QC108_201103, 0229_MW232_201103	03-Nov-2020	10-Nov-2020	02-May-2021	✓	10-Nov-2020	02-May-2021	✓



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) 0229_MW125_S_201102, 0229_MW124_201102, 0229_SW233_201102, 0229_SW205_201102, 0229_SW243_201102, 0229_SW242_201102,	0229_MW125_I_201102, 0229_SW217_201102, 0229_SW203_201102, 0229_SW220_201102, 0229_SW232_201102, 0229_QC302_201102	02-Nov-2020	09-Nov-2020	01-May-2021	✓	09-Nov-2020	01-May-2021	✓
HDPE (no PTFE) (EP231X) 0229_QC106_201102		02-Nov-2020	10-Nov-2020	01-May-2021	✓	10-Nov-2020	01-May-2021	✓
HDPE (no PTFE) (EP231X-INJ) 0229_MW235_S_201103, 0229_MW220_S_201103, 0229_MW205_S_201103, 0229_MW212_201103, 0229_SW227_201103, 0229_SW245_201103, 0229_QC303_201103,	0229_MW236_S_201103, 0229_QC110_201103, 0229_MW233_201103, 0229_MW217_201103, 0229_SW244_201103, 0229_QC108_201103, 0229_MW232_201103	03-Nov-2020	10-Nov-2020	02-May-2021	✓	10-Nov-2020	02-May-2021	✓
EP231P: PFAS Sums								
HDPE (no PTFE) (EP231X) 0229_MW125_S_201102, 0229_MW124_201102, 0229_SW233_201102, 0229_SW205_201102, 0229_SW243_201102, 0229_SW242_201102,	0229_MW125_I_201102, 0229_SW217_201102, 0229_SW203_201102, 0229_SW220_201102, 0229_SW232_201102, 0229_QC302_201102	02-Nov-2020	09-Nov-2020	01-May-2021	✓	09-Nov-2020	01-May-2021	✓
HDPE (no PTFE) (EP231X) 0229_QC106_201102		02-Nov-2020	10-Nov-2020	01-May-2021	✓	10-Nov-2020	01-May-2021	✓
HDPE (no PTFE) (EP231X-INJ) 0229_MW235_S_201103, 0229_MW220_S_201103, 0229_MW205_S_201103, 0229_MW212_201103, 0229_SW227_201103, 0229_SW245_201103, 0229_QC303_201103,	0229_MW236_S_201103, 0229_QC110_201103, 0229_MW233_201103, 0229_MW217_201103, 0229_SW244_201103, 0229_QC108_201103, 0229_MW232_201103	03-Nov-2020	10-Nov-2020	02-May-2021	✓	10-Nov-2020	02-May-2021	✓



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	Method	Count		Rate (%)			Quality Control Specification
		QC	Regular	Actual	Expected	Evaluation	
Analytical Methods							
Laboratory Duplicates (DUP)							
Moisture Content	EA055	2	15	13.33	10.00	✔	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	15	13.33	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	1	15	6.67	5.00	✔	NEPM 2013 B3 & ALS QC Standard

Matrix: WATER

Evaluation: ✖ = Quality Control frequency not within specification ; ✔ = Quality Control frequency within specification.

Quality Control Sample Type	Method	Count		Rate (%)			Quality Control Specification
		QC	Regular	Actual	Expected	Evaluation	
Analytical Methods							
Laboratory Duplicates (DUP)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	24	4.17	10.00	✖	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X-INJ	1	3	33.33	10.00	✔	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	24	8.33	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X-INJ	1	3	33.33	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	24	8.33	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X-INJ	1	3	33.33	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	0	24	0.00	5.00	✖	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X-INJ	1	3	33.33	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.
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.
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X-INJ	WATER	In house: Direct injection analysis of fresh waters after dilution (1:1) with mobile phase solvent. Analysis by LC-Electrospray-MS-MS, Negative Mode using MRM. Where commercially available, isotopically labelled analogues of the target analytes are used as internal standards for quantification. Where a labelled analogue is not commercially available, the internal standard with similar chemistry and the closest retention time to the target is used for quantification. 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.

Preparation Methods	Method	Matrix	Method Descriptions
Sample Extraction for PFAS in solid matrices	ORG73	SOIL	In-house: 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 conform to US DoD QSM 5.3, table B-15 requirements.
Preparation for PFAS in water.	EP231-PR	WATER	Method presumes direct injection without workup. Preparation includes addition of internal standard and surrogate, and filtration prior to analysis.
Solid Phase Extraction (SPE) for PFAS in water	ORG72	WATER	In-house: Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to the sample container. The entire contents are transferred to a solid phase extraction (SPE) cartridge. The sample container is successively rinsed with aliquots of the elution solvent. The eluted extract is combined with an equal volume of reagent water and a portion is filtered for analysis. Method procedures conform to US DoD QSM 5.3, table B-15 requirements.



SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : ET2004329

Client	: AECOM Australia Pty Ltd	Laboratory	: Environmental Division Townsville
Contact	: [REDACTED]	Contact	: [REDACTED]
Address	: [REDACTED]	Address	: [REDACTED]
E-mail	: [REDACTED]	E-mail	: [REDACTED]
Telephone	: ----	Telephone	: [REDACTED]
Facsimile	: ----	Facsimile	:
Project	: QLD_0229_PFASOMP_20	Page	: 1 of 4
Order number	: 60612487_3.1	Quote number	: ET2020AECOMAU0001 (TV/123/20)
C-O-C number	: 15443	QC Level	: NEPM 2013 B3 & ALS QC Standard
Site	: QLD_0229		
Sampler	: [REDACTED]		

Dates

Date Samples Received	: 03-Nov-2020 17:00	Issue Date	: 04-Nov-2020
Client Requested Due Date	: 12-Nov-2020	Scheduled Reporting Date	: 12-Nov-2020

Delivery Details

Mode of Delivery	: Client Drop Off	Security Seal	: Not Available
No. of coolers/boxes	: 1	Temperature	: 23.0 - Ice present
Receipt Detail	:	No. of samples received / analysed	: 44 / 44

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
- Discounted Package Prices apply only when specific ALS Group Codes ('W', 'S', 'NT' suites) are referenced on COCs.
- \$\$ conducted by ALS Townsville, NATA accreditation no. 825, (Site no. 23472 for Chemical Testing and Site no. 23313 for Biological Testing)
- Please direct any turn around / technical queries to the laboratory contact designated above.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months ± 1 week) from receipt of samples.
- All remaining analysis will be conducted by ALS Environmental, Brisbane, NATA accreditation no. 825, Site No. 818.
- 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.

ET2004329-003 : 02-Nov-2020 10:30 : 0229_MW124_201102 - Extra volume for lab qc

ET2004329-044 : 03-Nov-2020 16:17 : 0229_MW232_201103 - Extra volume for lab qc

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	Client sampling date / time	Client sample ID	SOIL - EA055-103 Moisture Content	SOIL - EP231X (solids) PFAS - Full Suite (28 analytes)
ET2004329-004	02-Nov-2020 11:28	0229_SD217_201102	✓	✓
ET2004329-005	02-Nov-2020 11:28	0229_QC107_201102	✓	✓
ET2004329-007	02-Nov-2020 11:56	0229_SD211_201102	✓	✓
ET2004329-009	02-Nov-2020 12:25	0229_SD212_201102	✓	✓
ET2004329-012	02-Nov-2020 13:54	0229_SD233_201102	✓	✓
ET2004329-014	02-Nov-2020 14:27	0229_SD203_201102	✓	✓
ET2004329-016	02-Nov-2020 15:17	0229_SD205_201102	✓	✓
ET2004329-017	02-Nov-2020 15:51	0229_SD220_201102	✓	✓
ET2004329-019	02-Nov-2020 16:22	0229_SD243_201102	✓	✓
ET2004329-022	02-Nov-2020 16:45	0229_SD232_201102	✓	✓
ET2004329-023	02-Nov-2020 17:09	0229_SD242_201102	✓	✓
ET2004329-035	03-Nov-2020 14:30	0229_SD227_201103	✓	✓
ET2004329-036	03-Nov-2020 15:36	0229_QC109_201103	✓	✓
ET2004329-037	03-Nov-2020 13:33	0229_SD244_201103	✓	✓
ET2004329-038	03-Nov-2020 11:40	0229_SD245_201103	✓	✓

Matrix: **WATER**

Laboratory sample ID	Client sampling date / time	Client sample ID	WATER - EP231X PFAS - Full Suite (28 analytes)
ET2004329-001	02-Nov-2020 10:17	0229_MW125_S_201102	✓
ET2004329-002	02-Nov-2020 10:18	0229_MW125_I_201102	✓
ET2004329-003	02-Nov-2020 10:30	0229_MW124_201102 E...	✓
ET2004329-006	02-Nov-2020 11:31	0229_SW217_201102	✓
ET2004329-008	02-Nov-2020 11:57	0229_SW211_201102	✓
ET2004329-010	02-Nov-2020 12:26	0229_SW212_201102	✓



				WATER - EP231X PFAS - Full Suite (28 analytes)
ET2004329-011	02-Nov-2020 13:53	0229_SW233_201102		✓
ET2004329-013	02-Nov-2020 14:25	0229_SW203_201102		✓
ET2004329-015	02-Nov-2020 15:16	0229_SW205_201102		✓
ET2004329-018	02-Nov-2020 15:52	0229_SW220_201102		✓
ET2004329-020	02-Nov-2020 16:19	0229_SW243_201102		✓
ET2004329-021	02-Nov-2020 16:44	0229_SW232_201102		✓
ET2004329-024	02-Nov-2020 17:09	0229_SW242_201102		✓
ET2004329-025	02-Nov-2020 17:15	0229_QC302_201102		✓
ET2004329-026	03-Nov-2020 10:14	0229_MW235_S_201103		✓
ET2004329-027	03-Nov-2020 10:50	0229_MW236_S_201103		✓
ET2004329-028	03-Nov-2020 11:56	0229_MW220_S_201103		✓
ET2004329-029	03-Nov-2020 11:57	0229_QC110_201103		✓
ET2004329-030	03-Nov-2020 12:26	0229_MW205_S_201103		✓
ET2004329-031	03-Nov-2020 12:51	0229_MW233_201103		✓
ET2004329-032	02-Nov-2020 11:31	0229_QC106_201102		✓
ET2004329-033	03-Nov-2020 13:35	0229_MW212_201103		✓
ET2004329-034	03-Nov-2020 13:59	0229_MW217_201103		✓
ET2004329-039	03-Nov-2020 14:45	0229_SW227_201103		✓
ET2004329-040	03-Nov-2020 13:30	0229_SW244_201103		✓
ET2004329-041	03-Nov-2020 09:30	0229_SW245_201103		✓
ET2004329-042	03-Nov-2020 15:42	0229_QC108_201103		✓
ET2004329-043	03-Nov-2020 16:15	0229_QC303_201103		✓
ET2004329-044	03-Nov-2020 16:17	0229_MW232_201103 E...		✓

Proactive Holding Time Report

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



Requested Deliverables

ACCOUNTS PAYABLE

- A4 - AU Tax Invoice (INV)

Email

[Redacted]

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

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DERP ESDAT REPORTS

- EDI Format - ESDAT (ESDAT)

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

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

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REPORT OF ANALYSIS

Client : AECOM AUSTRALIA PTY LTD	Job No. : AECO06/201109
██████████	Quote No. : QT-02018
████████████████████	Order No. : 60612487_3_1
Attention : ██████████	Date Received : 09-NOV-2020
Project Name : QLD_0229_PFASOMP_20	Sampled By : CLIENT
Your Client Services Manager : ██████████	Phone : ██████████

Lab Reg No.	Sample Ref	Sample Description
N20/026329	0229_QC203_201029	SOIL 29/10/20
N20/026331	0229_QC205_201029	SOIL 29/10/20
N20/026333	0229_QC207_201102	SOIL 2/11/20
N20/026335	0229_QC209_201103	SOIL 3/11/20

Lab Reg No.		N20/026329	N20/026331	N20/026333	N20/026335	
Date Sampled		29-OCT-2020	29-OCT-2020	02-NOV-2020	03-NOV-2020	
	Units					Method
PFAS (per-and poly-fluoroalkyl substances)						
PFBA (375-22-4)	mg/kg	<0.002	<0.002	<0.002	<0.002	NR70
PFPeA (2706-90-3)	mg/kg	<0.002	<0.002	<0.002	<0.002	NR70
PFHxA (307-24-4)	mg/kg	<0.001	<0.001	<0.001	<0.001	NR70
PFHpA (375-85-9)	mg/kg	<0.001	<0.001	<0.001	<0.001	NR70
PFOA (335-67-1)	mg/kg	<0.001	<0.001	<0.001	<0.001	NR70
PFNA (375-95-1)	mg/kg	<0.001	<0.001	<0.001	<0.001	NR70
PFDA (335-76-2)	mg/kg	<0.001	<0.001	<0.001	<0.001	NR70
PFUdA (2058-94-8)	mg/kg	<0.002	<0.002	<0.002	<0.002	NR70
PFDoA (307-55-1)	mg/kg	<0.002	<0.002	<0.002	<0.002	NR70
PFTrDA (72629-94-8)	mg/kg	<0.002	<0.002	<0.002	<0.002	NR70
PFTeDA (376-06-7)	mg/kg	<0.002	<0.002	<0.002	<0.002	NR70
PFHxDA (67905-19-5)	mg/kg	<0.002	<0.002	<0.002	<0.002	NR70
PFODA (16517-11-6)	mg/kg	<0.005	<0.005	<0.005	<0.005	NR70
FOUEA (70887-84-2)	mg/kg	<0.001	<0.01	<0.001	<0.001	NR70
PFBS (375-73-5)	mg/kg	<0.001	<0.001	<0.001	<0.001	NR70
PFPeS (2706-91-4)	mg/kg	<0.001	<0.001	<0.001	<0.001	NR70
PFHxS (355-46-4)	mg/kg	0.0071	<0.001	<0.001	<0.001	NR70
PFHpS (375-92-8)	mg/kg	<0.001	<0.001	<0.001	<0.001	NR70
PFOS (1763-23-1)	mg/kg	0.041	<0.002	<0.002	<0.002	NR70
PFNS (68259-12-1)	mg/kg	<0.001	<0.001	<0.001	<0.001	NR70
PFDS (335-77-3)	mg/kg	<0.001	<0.001	<0.001	<0.001	NR70
PFOSA (754-91-6)	mg/kg	<0.001	<0.001	<0.001	<0.001	NR70
N-MeFOSA (31506-32-8)	mg/kg	<0.002	<0.002	<0.002	<0.002	NR70
N-EtFOSA (4151-50-2)	mg/kg	<0.002	<0.002	<0.002	<0.002	NR70
N-MeFOSAA (2355-31-9)	mg/kg	<0.002	<0.002	<0.002	<0.002	NR70
N-EtFOSAA(2991-50-6)	mg/kg	<0.002	<0.002	<0.002	<0.002	NR70
N-MeFOSE (24448-09-7)	mg/kg	<0.005	<0.005	<0.005	<0.005	NR70

REPORT OF ANALYSIS

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Report No. RN1294231

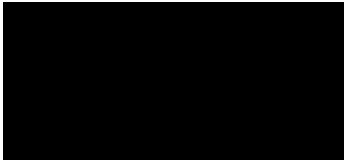
Lab Reg No.		N20/026329	N20/026331	N20/026333	N20/026335	
Date Sampled		29-OCT-2020	29-OCT-2020	02-NOV-2020	03-NOV-2020	
	Units					Method
PFAS (per-and poly-fluoroalkyl substances)						
N-EtFOSE (1691-99-2)	mg/kg	<0.005	<0.005	<0.005	<0.005	NR70
4:2 FTS (757124-72-4)	mg/kg	<0.001	<0.001	<0.001	<0.001	NR70
6:2 FTS (27619-97-2)	mg/kg	<0.001	<0.001	<0.001	<0.001	NR70
8:2 FTS (39108-34-4)	mg/kg	<0.001	<0.001	<0.001	<0.001	NR70
10:2 FTS (120226-60-0)	mg/kg	<0.002	<0.002	<0.002	<0.002	NR70
8:2 diPAP (678-41-1)	mg/kg	<0.002	<0.002	<0.002	<0.002	NR70
PFBA (Surrogate Recovery)	%	100	95	90	90	NR70
PFPeA (Surrogate Recovery)	%	85	87	93	91	NR70
PFHxA (Surrogate Recovery)	%	96	92	95	90	NR70
PFHpA (Surrogate Recovery)	%	78	90	90	89	NR70
PFOA (Surrogate Recovery)	%	93	91	101	94	NR70
PFNA (Surrogate Recovery)	%	92	103	86	101	NR70
PFDA (Surrogate Recovery)	%	97	100	94	96	NR70
PFUdA (Surrogate Recovery)	%	100	101	105	94	NR70
PFDoA (Surrogate Recovery)	%	91	103	94	88	NR70
PFTeDA (Surrogate Recovery)	%	104	108	102	107	NR70
PFHxDA (Surrogate Recovery)	%	62	100	102	107	NR70
FOUEA (Surrogate Recovery)	%	58	14	85	56	NR70
PFBS (Surrogate Recovery)	%	89	91	93	91	NR70
PFHxS (Surrogate Recovery)	%	88	88	93	87	NR70
PFOS (Surrogate Recovery)	%	112	96	83	83	NR70
PFOSA (Surrogate Recovery)	%	51	100	75	88	NR70
N-MeFOSA (Surrogate Recovery)	%	93	81	80	84	NR70
N-EtFOSA (Surrogate Recovery)	%	76	70	70	78	NR70
N-MeFOSAA (Surrogate Recovery)	%	82	78	83	71	NR70
N-EtFOSAA (Surrogate Recovery)	%	80	90	108	63	NR70
N-MeFOSE (Surrogate Recovery)	%	90	78	86	92	NR70
N-EtFOSE (Surrogate Recovery)	%	94	113	80	128	NR70
4:2 FTS (Surrogate Recovery)	%	65	64	61	61	NR70
6:2 FTS (Surrogate Recovery)	%	61	63	61	62	NR70
8:2 FTS (Surrogate Recovery)	%	74	78	80	65	NR70
8:2 diPAP (Surrogate Recovery)	%	63	42	81	45	NR70
Dates						
Date extracted		10-NOV-2020	10-NOV-2020	10-NOV-2020	10-NOV-2020	
Date analysed		10-NOV-2020	10-NOV-2020	10-NOV-2020	10-NOV-2020	

N20/026329
to
N20/026335

REPORT OF ANALYSIS

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

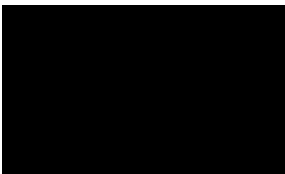
Selected PFAS surrogate recoveries are biased due to matrix effects.^δ
Surrogate recoveries low for selected analytes - PFAS LORs not raised since S/N > 10.
LOR raised for FOUEA in sample N20/026331 due to low surrogate recovery.



Organics - NSW
Accreditation No. 198

17-NOV-2020

Lab Reg No.		N20/026329	N20/026331	N20/026333	N20/026335	
Date Sampled		29-OCT-2020	29-OCT-2020	02-NOV-2020	03-NOV-2020	
	Units					Method
Trace Elements						
Total Solids	%	61.9	79.7	56.7	83.1	NT2_49
Dates						
Date extracted		11-NOV-2020	11-NOV-2020	11-NOV-2020	11-NOV-2020	
Date analysed		12-NOV-2020	12-NOV-2020	12-NOV-2020	12-NOV-2020	



Accreditation No. 198

17-NOV-2020

REPORT OF ANALYSIS

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Report No. RN1294231

Client : AECOM AUSTRALIA PTY LTD [REDACTED] [REDACTED] Attention : [REDACTED] Project Name : QLD_0229_PFASOMP_20 Your Client Services Manager : [REDACTED]	Job No. : AECO06/201109 Quote No. : QT-02018 Order No. : 60612487_3_1 Date Received : 09-NOV-2020 Sampled By : CLIENT Phone : [REDACTED]
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Lab Reg No.	Sample Ref	Sample Description
N20/026326	0229_QC200_201028	WATER 28/10/20
N20/026327	0229_QC201_201028	WATER 28/10/20
N20/026328	0229_QC202_201029	WATER 29/10/20
N20/026330	0229_QC204_201029	WATER 29/10/20

Lab Reg No.	Date Sampled	Units	N20/026326	N20/026327	N20/026328	N20/026330	Method
			28-OCT-2020	28-OCT-2020	29-OCT-2020	29-OCT-2020	
PFAS (per-and poly-fluoroalkyl substances)							
PFBA (375-22-4)	ug/L		<0.05	0.69	0.062	0.17	NR70
PFPeA (2706-90-3)	ug/L		<0.02	1.0	0.043	0.20	NR70
PFHxA (307-24-4)	ug/L		0.094	4.3	0.19	1.2	NR70
PFHpA (375-85-9)	ug/L		0.014	0.72	0.020	0.088	NR70
PFOA (335-67-1)	ug/L		0.061	1.0	0.038	0.15	NR70
PFNA (375-95-1)	ug/L		<0.01	<0.01	<0.01	<0.01	NR70
PFDA (335-76-2)	ug/L		<0.01	<0.01	<0.01	<0.01	NR70
PFUdA (2058-94-8)	ug/L		<0.01	<0.01	<0.01	<0.01	NR70
PFDoA (307-55-1)	ug/L		<0.01	<0.01	<0.01	<0.01	NR70
PFTrDA (72629-94-8)	ug/L		<0.02	<0.02	<0.02	<0.02	NR70
PFTeDA (376-06-7)	ug/L		<0.02	<0.02	<0.02	<0.02	NR70
PFHxDA (67905-19-5)	ug/L		<0.02	<0.02	<0.02	<0.02	NR70
PFODA (16517-11-6)	ug/L		<0.05	<0.05	<0.05	<0.05	NR70
FOUEA (70887-84-2)	ug/L		<0.01	<0.01	<0.01	<0.01	NR70
PFDS (335-77-3)	ug/L		<0.01	<0.01	<0.01	<0.01	NR70
PFPeS (2706-91-4)	ug/L		0.092	2.1	0.089	0.36	NR70
PFHxS (355-46-4)	ug/L		1.4	14	0.77	5.6	NR70
PFHpS (375-92-8)	ug/L		0.072	0.79	0.025	0.19	NR70
PFOS (1763-23-1)	ug/L		2.1	19	1.1	6.7	NR70
PFNS (68259-12-1)	ug/L		<0.01	<0.01	<0.01	<0.01	NR70
PFBS (375-73-5)	ug/L		0.10	2.5	0.12	0.35	NR70
PFOSA (754-91-6)	ug/L		<0.01	<0.01	<0.01	<0.01	NR70
N-MeFOSA (31506-32-8)	ug/L		<0.02	<0.02	<0.02	<0.02	NR70
N-EtFOSA (4151-50-2)	ug/L		<0.02	<0.02	<0.02	<0.02	NR70
N-MeFOSAA (2355-31-9)	ug/L		<0.01	<0.01	<0.01	<0.01	NR70
N-EtFOSAA(2991-50-6)	ug/L		<0.01	<0.01	<0.01	<0.01	NR70
N-MeFOSE (24448-09-7)	ug/L		<0.05	<0.05	<0.05	<0.05	NR70

REPORT OF ANALYSIS

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Report No. RN1294231

Lab Reg No.			N20/026326	N20/026327	N20/026328	N20/026330	
Date Sampled			28-OCT-2020	28-OCT-2020	29-OCT-2020	29-OCT-2020	
		Units					Method
PFAS (per-and poly-fluoroalkyl substances)							
N-EtFOSE (1691-99-2)	ug/L	<0.05	<0.05	<0.05	<0.05	<0.05	NR70
4:2 FTS (757124-72-4)	ug/L	<0.01	<0.01	<0.01	<0.01	<0.01	NR70
6:2 FTS (27619-97-2)	ug/L	0.012	0.065	<0.01	<0.01	<0.01	NR70
8:2 FTS (39108-34-4)	ug/L	<0.01	<0.01	<0.01	<0.01	<0.01	NR70
10:2 FTS (120226-60-0)	ug/L	<0.01	<0.01	<0.01	<0.01	<0.01	NR70
8:2 diPAP (678-41-1)	ug/L	<0.02	<0.02	<0.02	<0.02	<0.02	NR70
PFBA (Surrogate Recovery)	%	95	93	97	85	85	NR70
PFPeA (Surrogate Recovery)	%	95	82	88	75	75	NR70
PFHxA (Surrogate Recovery)	%	96	79	94	85	85	NR70
PFHpA (Surrogate Recovery)	%	101	84	94	80	80	NR70
PFOA (Surrogate Recovery)	%	100	91	102	92	92	NR70
PFNA (Surrogate Recovery)	%	82	83	70	77	77	NR70
PFDA (Surrogate Recovery)	%	82	71	74	71	71	NR70
PFUdA (Surrogate Recovery)	%	100	77	62	55	55	NR70
PFDoA (Surrogate Recovery)	%	86	75	64	57	57	NR70
PFTeDA (Surrogate Recovery)	%	91	84	67	77	77	NR70
PFHxDA (Surrogate Recovery)	%	95	96	88	82	82	NR70
FOUEA (Surrogate Recovery)	%	89	78	70	92	92	NR70
PFBS (Surrogate Recovery)	%	111	97	100	88	88	NR70
PFHxS (Surrogate Recovery)	%	100	76	94	80	80	NR70
PFOS (Surrogate Recovery)	%	113	76	69	73	73	NR70
PFOSA (Surrogate Recovery)	%	57	61	75	45	45	NR70
N-MeFOSA (Surrogate Recovery)	%	73	58	47	57	57	NR70
N-EtFOSA (Surrogate Recovery)	%	59	62	63	54	54	NR70
N-MeFOSAA (Surrogate Recovery)	%	69	74	65	85	85	NR70
N-EtFOSAA (Surrogate Recovery)	%	135	76	56	63	63	NR70
N-MeFOSE (Surrogate Recovery)	%	84	75	64	52	52	NR70
N-EtFOSE (Surrogate Recovery)	%	117	82	101	45	45	NR70
4:2 FTS (Surrogate Recovery)	%	74	71	70	76	76	NR70
6:2 FTS (Surrogate Recovery)	%	63	56	56	55	55	NR70
8:2 FTS (Surrogate Recovery)	%	49	48	47	53	53	NR70
8:2 diPAP (Surrogate Recovery)	%	49	52	47	41	41	NR70
Dates							
Date extracted		11-NOV-2020	11-NOV-2020	11-NOV-2020	11-NOV-2020	11-NOV-2020	
Date analysed		11-NOV-2020	11-NOV-2020	11-NOV-2020	11-NOV-2020	11-NOV-2020	

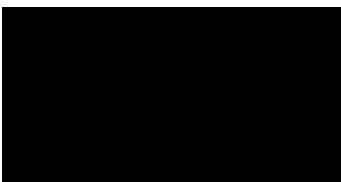
N20/026326
to
N20/026336

REPORT OF ANALYSIS

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

Selected PFAS surrogate recoveries are biased due to matrix effects.^δ
Surrogate recoveries low for selected analytes - PFAS LORs not raised since S/N > 10.



Accreditation No. 198

17-NOV-2020

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Report No. RN1294231

Client : AECOM AUSTRALIA PTY LTD [REDACTED] [REDACTED] Attention : [REDACTED] Project Name : QLD_0229_PFASOMP_20 Your Client Services Manager : [REDACTED]	Job No. : AECO06/201109 Quote No. : QT-02018 Order No. : 60612487_3_1 Date Received : 09-NOV-2020 Sampled By : CLIENT Phone : [REDACTED]
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Lab Reg No.	Sample Ref	Sample Description
N20/026332	0229_QC206_201102	WATER 2/11/20
N20/026334	0229_QC208_201103	WATER 3/11/20
N20/026336	0229_QC210_201103	WATER 3/11/20

Lab Reg No.	Date Sampled	Units	N20/026332	N20/026334	N20/026336	Method
			02-NOV-2020	03-NOV-2020	03-NOV-2020	
PFAS (per-and poly-fluoroalkyl substances)						
PFBA (375-22-4)	ug/L		<0.05	<0.05	0.099	NR70
PFPeA (2706-90-3)	ug/L		<0.02	<0.02	<0.02	NR70
PFHxA (307-24-4)	ug/L		<0.01	<0.01	0.024	NR70
PFHpA (375-85-9)	ug/L		<0.01	<0.01	<0.01	NR70
PFOA (335-67-1)	ug/L		<0.01	<0.01	<0.01	NR70
PFNA (375-95-1)	ug/L		<0.01	<0.01	<0.01	NR70
PFDA (335-76-2)	ug/L		<0.01	<0.01	<0.01	NR70
PFUdA (2058-94-8)	ug/L		<0.01	<0.01	<0.01	NR70
PFDoA (307-55-1)	ug/L		<0.01	<0.01	<0.01	NR70
PFTrDA (72629-94-8)	ug/L		<0.02	<0.02	<0.02	NR70
PFTeDA (376-06-7)	ug/L		<0.02	<0.02	<0.02	NR70
PFHxDA (67905-19-5)	ug/L		<0.02	<0.02	<0.02	NR70
PFODA (16517-11-6)	ug/L		<0.05	<0.05	<0.05	NR70
FOUEA (70887-84-2)	ug/L		<0.01	<0.01	<0.01	NR70
PFDS (335-77-3)	ug/L		<0.01	<0.01	<0.01	NR70
PFPeS (2706-91-4)	ug/L		<0.01	<0.01	0.12	NR70
PFHxS (355-46-4)	ug/L		<0.01	<0.01	0.68	NR70
PFHpS (375-92-8)	ug/L		<0.01	<0.01	<0.01	NR70
PFOS (1763-23-1)	ug/L		<0.02	<0.02	0.025	NR70
PFNS (68259-12-1)	ug/L		<0.01	<0.01	<0.01	NR70
PFBS (375-73-5)	ug/L		<0.01	<0.01	0.17	NR70
PFOSA (754-91-6)	ug/L		<0.01	<0.01	<0.01	NR70
N-MeFOSA (31506-32-8)	ug/L		<0.02	<0.02	<0.02	NR70
N-EtFOSA (4151-50-2)	ug/L		<0.02	<0.02	<0.02	NR70
N-MeFOSAA (2355-31-9)	ug/L		<0.01	<0.01	<0.01	NR70
N-EtFOSAA(2991-50-6)	ug/L		<0.01	<0.01	<0.01	NR70
N-MeFOSE (24448-09-7)	ug/L		<0.05	<0.05	<0.05	NR70
N-EtFOSE (1691-99-2)	ug/L		<0.05	<0.05	<0.05	NR70

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Lab Reg No.			N20/026332	N20/026334	N20/026336		
Date Sampled			02-NOV-2020	03-NOV-2020	03-NOV-2020		
		Units					Method
PFAS (per-and poly-fluoroalkyl substances)							
4:2 FTS (757124-72-4)	ug/L	<0.01	<0.01	<0.01	<0.01		NR70
6:2 FTS (27619-97-2)	ug/L	<0.01	<0.01	0.31			NR70
8:2 FTS (39108-34-4)	ug/L	<0.01	<0.01	<0.01			NR70
10:2 FTS (120226-60-0)	ug/L	<0.01	<0.01	<0.01			NR70
8:2 diPAP (678-41-1)	ug/L	<0.02	<0.02	<0.02			NR70
PFBA (Surrogate Recovery)	%	91	99	90			NR70
PFPeA (Surrogate Recovery)	%	84	87	87			NR70
PFHxA (Surrogate Recovery)	%	90	101	95			NR70
PFHpA (Surrogate Recovery)	%	89	103	92			NR70
PFOA (Surrogate Recovery)	%	89	101	97			NR70
PFNA (Surrogate Recovery)	%	75	82	79			NR70
PFDA (Surrogate Recovery)	%	69	73	60			NR70
PFUdA (Surrogate Recovery)	%	56	58	72			NR70
PFDoA (Surrogate Recovery)	%	64	67	80			NR70
PFTeDA (Surrogate Recovery)	%	82	77	102			NR70
PFHxDA (Surrogate Recovery)	%	85	98	94			NR70
FOUEA (Surrogate Recovery)	%	80	83	76			NR70
PFBS (Surrogate Recovery)	%	89	111	103			NR70
PFHxS (Surrogate Recovery)	%	97	98	101			NR70
PFOS (Surrogate Recovery)	%	83	86	72			NR70
PFOSA (Surrogate Recovery)	%	53	63	57			NR70
N-MeFOSA (Surrogate Recovery)	%	56	68	83			NR70
N-EtFOSA (Surrogate Recovery)	%	52	60	80			NR70
N-MeFOSAA (Surrogate Recovery)	%	65	67	83			NR70
N-EtFOSAA (Surrogate Recovery)	%	72	58	106			NR70
N-MeFOSE (Surrogate Recovery)	%	54	63	86			NR70
N-EtFOSE (Surrogate Recovery)	%	61	90	107			NR70
4:2 FTS (Surrogate Recovery)	%	91	70	91			NR70
6:2 FTS (Surrogate Recovery)	%	62	73	67			NR70
8:2 FTS (Surrogate Recovery)	%	50	57	53			NR70
8:2 diPAP (Surrogate Recovery)	%	40	45	29			NR70
Dates							
Date extracted		11-NOV-2020	11-NOV-2020	11-NOV-2020			
Date analysed		11-NOV-2020	11-NOV-2020	11-NOV-2020			

Accreditation No. 198

17-NOV-2020

105 Delhi Road, North Ryde NSW 2113 Tel: +61 2 9449 0111 www.measurement.gov.au

National Measurement Institute

REPORT OF ANALYSIS

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ACCREDITED FOR
**TECHNICAL
COMPETENCE**

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

This Report supersedes reports: *RN1294055*
RN1294134

Measurement Uncertainty is available upon request.

Chemical Accreditation 198: 105 Delhi Road, North Ryde, NSW, 2113



Australian Government
National Measurement Institute

QUALITY ASSURANCE REPORT

Client: AECOM AUSTRALIA PTY LTD

NMI QA Report No: AE006/201109

Sample Matrix: Liquid

Analyte	Method	LOR	Blank	Sample Duplicates			Recoveries	
				Sample	Duplicate	RPD	LCS	Matrix Spike
		ug/L	ug/L	ug/L	ug/L	%	%	%
PFBA (375-22-4)	NR70	0.05	<0.05	NA	NA	NA	98	NA
PFPeA (2706-90-3)	NR70	0.02	<0.02	NA	NA	NA	100	NA
PFHxA (307-24-4)	NR70	0.01	<0.01	NA	NA	NA	94	NA
PFHpA (375-85-9)	NR70	0.01	<0.01	NA	NA	NA	97	NA
PFOA (335-67-1)	NR70	0.01	<0.01	NA	NA	NA	95	NA
PFNA (375-95-1)	NR70	0.01	<0.01	NA	NA	NA	100	NA
PFDA (335-76-2)	NR70	0.01	<0.01	NA	NA	NA	92	NA
PFUDA (2058-94-8)	NR70	0.01	<0.01	NA	NA	NA	98	NA
PFDOA (307-55-1)	NR70	0.01	<0.01	NA	NA	NA	105	NA
PFTDA (72629-94-8)	NR70	0.02	<0.02	NA	NA	NA	108	NA
PFTeDA (376-06-7)	NR70	0.02	<0.02	NA	NA	NA	114	NA
PFHxDA (67905-19-5)	NR70	0.02	<0.02	NA	NA	NA	99	NA
PFODA (16517-11-6)	NR70	0.05	<0.05	NA	NA	NA	104	NA
FOUEA (70887-84-2)	NR70	0.01	<0.01	NA	NA	NA	102	NA
PFBS (375-73-5)	NR70	0.01	<0.01	NA	NA	NA	91	NA
PFPeS (2706-91-4)	NR70	0.01	<0.01	NA	NA	NA	90	NA
PFHxS (355-46-4)	NR70	0.01	<0.01	NA	NA	NA	102	NA
PFHpS (375-92-8)	NR70	0.01	<0.01	NA	NA	NA	96	NA
PFOS (1763-23-1)	NR70	0.02	<0.02	NA	NA	NA	97	NA
PFNS (68259-12-1)	NR70	0.01	<0.01	NA	NA	NA	96	NA
PFDS (335-77-3)	NR70	0.01	<0.01	NA	NA	NA	94	NA
PFOSA (754-91-6)	NR70	0.01	<0.01	NA	NA	NA	104	NA
N-MeFOSA (31506-32-8)	NR70	0.02	<0.02	NA	NA	NA	107	NA
N-EtFOSA (4151-50-2)	NR70	0.02	<0.02	NA	NA	NA	100	NA
N-MeFOSAA (2355-31-9)	NR70	0.01	<0.01	NA	NA	NA	89	NA
N-EtFOSAA (2991-50-6)	NR70	0.01	<0.01	NA	NA	NA	92	NA
N-MeFOSE (24448-09-7)	NR70	0.05	<0.05	NA	NA	NA	147	NA
N-EtFOSE (1691-99-2)	NR70	0.05	<0.05	NA	NA	NA	96	NA
4:2 FTS (757124-72-4)	NR70	0.01	<0.01	NA	NA	NA	106	NA
6:2 FTS (27619-97-2)	NR70	0.01	<0.01	NA	NA	NA	90	NA
8:2 FTS (39108-34-4)	NR70	0.01	<0.01	NA	NA	NA	105	NA
10:2 FTS (120226-60-0)	NR70	0.01	<0.01	NA	NA	NA	108	NA
8:2 diPAP (678-41-1)	NR70	0.02	<0.02	NA	NA	NA	104	NA

Results expressed in percentage (%) or ug/L wherever appropriate.

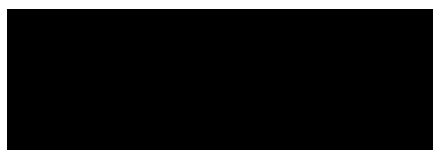
Acceptable Spike recovery is 50-150%.

Maximum acceptable RPDs on spikes and duplicates is 40%.

'NA' = Not Applicable.

RPD= Relative Percentage Difference.

Signed:



Date:

16/11/2020



QUALITY ASSURANCE REPORT

Client: AECOM AUSTRALIA PTY LTD

NMI QA Report No: AECO06/201109

Sample Matrix: Solid

Analyte	Method	LOR	Blank	Sample Duplicates			Recoveries	
				Sample	Duplicate	RPD	LCS	Matrix Spike
				mg/kg	mg/kg	%	%	%
		mg/kg	mg/kg	mg/kg	mg/kg	%	%	%
				N20/026335				N20/026335
PFBA (375-22-4)	NR70	0.002	<0.002	<0.002	<0.002	-	118	96
PFPeA (2706-90-3)	NR70	0.002	<0.002	<0.002	<0.002	-	102	93
PFHxA (307-24-4)	NR70	0.001	<0.001	<0.001	<0.001	-	111	96
PFHpA (375-85-9)	NR70	0.001	<0.001	<0.001	<0.001	-	110	101
PFOA (335-67-1)	NR70	0.001	<0.001	<0.001	<0.001	-	103	98
PFNA (375-95-1)	NR70	0.001	<0.001	<0.001	<0.001	-	100	106
PFDA (335-76-2)	NR70	0.001	<0.001	<0.001	<0.001	-	112	104
PFUdA (2058-94-8)	NR70	0.002	<0.002	<0.002	<0.002	-	99	98
PFDoA (307-55-1)	NR70	0.002	<0.002	<0.002	<0.002	-	97	104
PFTrDA (72629-94-8)	NR70	0.002	<0.002	<0.002	<0.002	-	95	103
PFTeDA (376-06-7)	NR70	0.002	<0.002	<0.002	<0.002	-	107	95
PFHxDA (67905-19-5)	NR70	0.002	<0.002	<0.002	<0.002	-	102	101
PFODA (16517-11-6)	NR70	0.005	<0.005	<0.005	<0.005	-	82	102
FOUEA (70887-84-2)	NR70	0.001	<0.001	<0.001	<0.001	-	109	95
PFBS (375-73-5)	NR70	0.001	<0.001	<0.001	<0.001	-	106	104
PFPeS (2706-91-4)	NR70	0.001	<0.001	<0.001	<0.001	-	110	104
PFHxS (355-46-4)	NR70	0.001	<0.001	<0.001	<0.001	-	106	96
PFHpS (375-92-8)	NR70	0.001	<0.001	<0.001	<0.001	-	100	102
PFOS (1763-23-1)	NR70	0.002	<0.002	<0.002	<0.002	-	140	98
PFNS (68259-12-1)	NR70	0.001	<0.001	<0.001	<0.001	-	122	100
PFDS (335-77-3)	NR70	0.001	<0.001	<0.001	<0.001	-	116	99
PFOSA (754-91-6)	NR70	0.001	<0.001	<0.001	<0.001	-	102	111
N-MeFOSA (31506-32-8)	NR70	0.002	<0.002	<0.002	<0.002	-	100	126
N-EtFOSA (4151-50-2)	NR70	0.002	<0.002	<0.002	<0.002	-	138	128
N-MeFOSAA (2355-31-9)	NR70	0.002	<0.002	<0.002	<0.002	-	92	96
N-EtFOSAA(2991-50-6)	NR70	0.002	<0.002	<0.002	<0.002	-	93	121
N-MeFOSE (24448-09-7)	NR70	0.005	<0.005	<0.005	<0.005	-	104	114
N-EtFOSE (1691-99-2)	NR70	0.005	<0.005	<0.005	<0.005	-	77	76
4:2 FTS (757124-72-4)	NR70	0.001	<0.001	<0.001	<0.001	-	97	100
6:2 FTS (27619-97-2)	NR70	0.001	<0.001	<0.001	<0.001	-	88	93
8:2 FTS (39108-34-4)	NR70	0.001	<0.001	<0.001	<0.001	-	105	125
10:2 FTS (120226-60-0)	NR70	0.002	<0.002	<0.002	<0.002	-	116	117
8:2 diPAP (678-41-1)	NR70	0.002	<0.002	<0.002	<0.002	-	114	109

Results expressed in percentage (%) or mg/kg wherever appropriate.

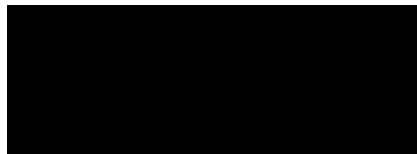
Acceptable Spike recovery is 50-150%.

Maximum acceptable RPDs on spikes and duplicates is 40%.

'NA' = Not Applicable.

RPD= Relative Percentage Difference.

Signed:



Date:

16/11/2020



SAMPLE RECEIPT NOTIFICATION

CUSTOMER DETAILS

Attention: [REDACTED]
Customer: AECOM AUSTRALIA PTY LTD
Address: [REDACTED]
Email: [REDACTED]
Telephone:
Fax:

LABORATORY DETAILS

Lab: National Measurement Institute
Contact: [REDACTED]
Address: [REDACTED]
Email: [REDACTED]
Telephone: [REDACTED]
Fax:

SAMPLE DETAILS

NMI Job Name: AECO06/201109

Total No. of Samples: 11

LRNs	Estimated Report Date	Customer Sample ID	Lab Sample Description
N20/026326	16-NOV-2020	0229_QC200_201028	WATER 28/10/20
N20/026327	16-NOV-2020	0229_QC201_201028	WATER 28/10/20
N20/026328	16-NOV-2020	0229_QC202_201029	WATER 29/10/20
N20/026329	16-NOV-2020	0229_QC203_201029	SOIL 29/10/20
N20/026330	16-NOV-2020	0229_QC204_201029	WATER 29/10/20
N20/026331	16-NOV-2020	0229_QC205_201029	SOIL 29/10/20
N20/026332	16-NOV-2020	0229_QC206_201102	WATER 2/11/20
N20/026333	16-NOV-2020	0229_QC207_201102	SOIL 2/11/20
N20/026334	16-NOV-2020	0229_QC208_201103	WATER 3/11/20
N20/026335	16-NOV-2020	0229_QC209_201103	SOIL 3/11/20
N20/026336	16-NOV-2020	0229_QC210_201103	WATER 3/11/20

SAMPLE RECEIVED CONDITION

Date samples received: 9-NOV-2020

Sample received in good order: Yes

NMI Quotation no. provided: QLD_0229_PFASOMP_20

Client purchase order number: 60612487_3_1

Temperature of samples: Chilled

Comments: ALL OK

Mode of Delivery: Courier

Additional Terms and Conditions

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

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

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

Appendix F

Equipment Calibration Certificates



Calibration Certificate

AirMet Scientific P/L
 135 Sydney Street
 Mackay
 QLD 4740, Australia
 Tel: 07 4951 7500
 Fax: 07 4951 7575

This document certifies that the instrument detailed has been calibrated to the parameters

Certificate Print Date: 13-Nov-2019 Call ID / Order No: 240179
 Calibration Date: 08-Nov-2019 Job No / Pack No: S2401790001
 Next Calibration Due: 7-Nov-2020

Customer: AECOM Australia Pty Ltd (Townsville)-ID **Serial No:** 18K102334
Description: 407250
 Xylem ProDSS Handheld, No GPS

Calibration Summary

Frequency: 365 Use Days Temp: 21.8°C As Found: Out of Tolerance Result: Pass
 Humidity: 45% Certificate: S2401790001

Desc	As Found		As Left (Cal Status)	
	Actual	Result	Actual	Result
PH4	3.96	Pass	4.01	Pass
PH7	7.0	Pass	7.01	Pass
Specific Conductivity	2749.0	Fail	2758.0	Pass
DO	0.1	Pass	0.0	Pass
Turbidity	118.0	Fail	100.02	Pass
ORP	226.0	Pass	236.0	Pass

Equip ID	Standard Used Description	Valid Until	Cert
----------	---------------------------	-------------	------

Completed By: _____

Signed: _____

Solinst Model 122 Interface Meter

Instrument **Interface Meter (30M)**
Serial No. **312512**



airmet

Air-Met Scientific Pty Ltd
1300 137 067

Item	Test	Pass	Comments
Battery	Compartment	✓	
	Capacity	✓	
Probe	Cleaned/Decon.	✓	
	Operation	✓	
Connectors	Condition	✓	
		✓	
Tape Check	Cleaned	✓	
Connectors	Checked for cuts	✓	
Instrument Test	At surface level	✓	

Certificate of Calibration

This is to certify that the above instrument has been cleaned and tested.

Calibrated by: _____



Calibration date: 2/10/2020



Next calibration due: 2/12/2020

ANZ

FQM - Water Quality Meter Calibration Record

Q4AN(EV)-410-FM1

Project Name:	LAVARACK PFA3 OMT	Project Number:	60612487-3.1
Project Location:		Client:	Dept of Defence
PM Name:		Fieldwork Staff Name:	

This calibration record is intended to prompt fieldwork staff to calibrate water quality meter (WQM) daily before the start of fieldworks.

INSTRUMENT DETAILS

Supplier:	AECOM Owner.
Make and Model:	YSI PRODS5
Serial Number:	18K102334

CALIBRATION

CALIBRATE WITH CALIBRATION SOLUTIONS

Date and Time:	28/10/2020		18:30		
Parameter	Acidity		Conductivity	Dissolved Oxygen	ORP
Units	pH	pH	µS/cm	%	
Calibration Standard Concentration:	4	7	2760	100	262.0
Calibration Reading:	4.86	8.03	2566	103.6	311.7
Calibration Temperature:	23.3	22.7	22.6	21.7	9.1

ONGOING CHECKS

BUMP TEST WITH CALIBRATION SOLUTION

Date and Time:	26.10.20		0830		
Parameter	Acidity		Conductivity	Dissolved Oxygen	ORP
Units	pH	pH	µS/cm	%	
Calibration Standard Concentration:	7	6	2760	100	262
Bump Test Reading:	7.03	10.07	2900	96.7	258
Bump Test Temperature:	25.1	25.1	24.8	25.1	16.0

COMMENTS

Detail any equipment faults, minor maintenance performed, change of batteries or technical support provided.

WQM due for calibration 7/11/2020.

Approval and Distribution

Each individual instrument has been inspected and calibrated daily and bump tested as required by fieldwork staff.

Fieldwork Staff Signature

28/10/2020

Date

Distribution: Project Central File

ANZ

FQM - Water Quality Meter Calibration Record

Q4AN(EV)-410-FM1

Project Name:	Defence PFAS OMP	Project Number:	60612487-3.1
Project Location:	Lavarack Barracks	Client:	Dept. of Defence
PM Name:	[Redacted]	Fieldwork Staff Name:	[Redacted]

This calibration record is intended to prompt fieldwork staff to calibrate water quality meter (WQM) daily before the start of fieldworks.

INSTRUMENT DETAILS

Supplier:	AECOM
Make and Model:	YSI PRO DSS
Serial Number:	18K102334

CALIBRATION

CALIBRATE WITH CALIBRATION SOLUTIONS

Date and Time:	02.11.2020 0815				
Parameter	Acidity		Conductivity	Dissolved Oxygen	ORP
Units	pH	pH	µS/cm	%	
Calibration Standard Concentration:	7.0	9.99	2760	100	
Calibration Reading:	6.34	9.14	2896	99.4	
Calibration Temperature:	25.7	25.7	25.0	25.9	

ONGOING CHECKS

BUMP TEST WITH CALIBRATION SOLUTION

Date and Time:	03.11.2020 0740				
Parameter	Acidity		Conductivity	Dissolved Oxygen	ORP
Units	pH	pH	µS/cm	%	
Calibration Standard Concentration:	4.0	7.0	2760	100	
Bump Test Reading:	4.2	7.29	2878	100.2	
Bump Test Temperature:	24.3	24.3	24.6	25.5	

COMMENTS

Detail any equipment faults, minor maintenance performed, change of batteries or technical support provided.

[Empty space for comments]

Approval and Distribution

Each individual instrument is calibrated daily and bump tested as required by fieldwork staff.

Fieldwork Staff Signature

03.11.20

Date

Distribution: Project Central File

Sampling Event Factual Report, March/April 2021

PFAS Ongoing Monitoring Program - Lavarack Barracks, Townsville,
QLD

02-Aug-2021
PFAS Ongoing Monitoring Program Lavarack Barracks
Doc No. 60612487_RP39_20210802_0

AECOM

PFAS Ongoing Monitoring Program Lavarack Barracks
Sampling Event Factual Report, March/April 2021 – PFAS Ongoing Monitoring
Program - Lavarack Barracks, Townsville, QLD

Sampling Event Factual Report, March/April 2021

PFAS Ongoing Monitoring Program - Lavarack Barracks, Townsville, QLD

Client: Department of Defence Directorate of PFAS Remediation

ABN: 68 706 814 312

Prepared by

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02-Aug-2021

Job No.: 60612487

AECOM in Australia and New Zealand is certified to ISO9001, ISO14001 AS/NZS4801 and OHSAS18001.

Quality Information

Document Sampling Event Factual Report, March/April 2021

Ref 60612487

Date 02-Aug-2021

Prepared by 

Reviewed by 

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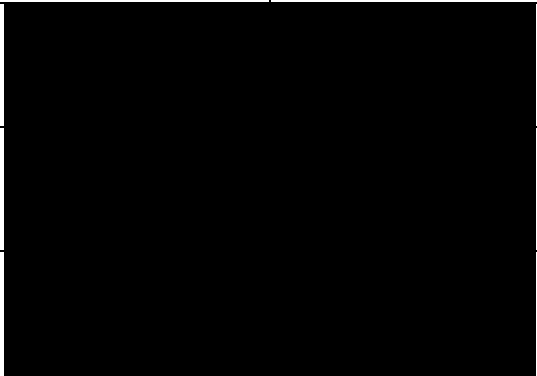
Rev	Revision Date	Details	Authorised	
			Name/Position	Signature
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Abbreviations

Abbreviation	Term
AECOM	AECOM Australia Pty Ltd
AFFF	Aqueous Film Forming Foam
AHD	Australian Height Datum
ALS	ALS Environmental Pty Ltd
Defence	Department of Defence
DO	Dissolved Oxygen
DoH	Department of Health
EC	Electrical Conductivity
FSANZ	Food Standards Australia New Zealand
HEPA	Heads of Environment Protection Authority
LOR	Limit of Reporting
NATA	National Association of Testing Authorities
NEPM	National Environment Protection Measure
NHMRC	National Health and Medical Research Council
NMI	National Measurement Institute
OMP	Ongoing Monitoring Program
ORP	Oxidation Reduction Potential
PFAS	Per- and poly-fluoroalkyl substances
PFHxS	Perfluorohexanesulfonic acid
PFOA	Perfluorooctanoic acid
PFOS	Perfluorooctanesulfonic acid
PMAP	PFAS Management Area Plan
QA/QC	Quality Assurance and Quality Control
SAQP	Sampling and Analysis Quality Plan

Units

Abbreviation	Term	Abbreviation	Term
km	Kilometre	mAHD	Metres Australian Height Datum
L	Litres	mBTOC	Metres below top of casing
M	Metre		

1.0 Introduction

1.1 General

AECOM Australia Pty Ltd (AECOM) was engaged by the Department of Defence (Defence) to implement the per- and poly-fluoroalkyl substances (PFAS) Ongoing Monitoring Program (OMP) outlined in the PFAS Management Area Plan (PMAP) (Department of Defence, 2020) at Lavarack Barracks, Townsville (the 'Base') located in the North Queensland Region. The location of the Base and the PFAS Source Areas are shown in **Figure 1** in **Appendix A**. The OMP (Department of Defence, 2020) for Lavarack Barracks includes biannual groundwater, surface water, and sediment sampling events in October 2020, April and October in 2021 and April 2022.

These sampling events include the following:

- Groundwater sampling of 31 on-Base wells at Lavarack Barracks and nine off-Base wells in the suburbs of Annandale, Idalia and Wulguru.
- Sediment sampling at 17 on-Base locations at Lavarack Barracks and 13 off-Base locations in the Ross River and waterways in Annandale and Idalia with co-located surface water sampling when water is present.

Following each sampling event, a factual report will be prepared. Annual interpretative reports will be prepared following the completion of each 12-month sampling period. This sampling event factual report has been prepared to report the results of the post wet-season sampling event completed in late March to May 2021, specifically highlighting first-time detections and/or first-time exceedances of human health screening criteria for perfluorooctane sulfonate (PFOS) + perfluorohexane sulfonic acid (PFHxS) and perfluorooctanoic acid (PFOA), where relevant, and the results of follow up sampling to verify concentrations at two surface water locations was completed June 2021.

This report has been prepared in accordance with the Defence (2020) PFAS OMP factual reports – interim guidance for preparation, v0.2, May 2021 (Department of Defence, 2021).

1.2 Objectives

The objectives of the OMP are to:

- Implement the OMP prepared as part of the PMAP; and
- Collect data that will enable Defence to maintain an up to date understanding of the distribution, concentration and transport of PFAS at the Base.

The data will assist in the timely identification of risks and inform Defence's approach to the management of PFAS, including updates and revisions to the PMAP.

The objective of this phase of works is to implement the scope of works for the March/April 2021 sampling event in accordance with the sampling and analysis quality plan (SAQP) (AECOM, 2021).

2.0 Scope of Work

The sampling event at Lavarack Barracks was completed in general accordance with the SAQP (AECOM, 2021). In summary, the scope of works for this sampling event included:

- Obtaining permission to work in public spaces where some sampling locations are situated.
- Review of the SAQP prior to monitoring event to ensure compliance with the following:
 - PFAS National Environmental Management Plan (NEMP) (2020);
 - National Environment Protection (Assessment of Site Contamination) Measure 1999, Schedule B1, as amended in 2013 (ASC NEPM, 2013);
 - Defence Routine Environment Water Quality Monitoring Program;
 - AS/NZ 5667:1998 Water quality – Sampling;
 - Australian and New Zealand Guidelines for Fresh and Marine Water Quality; and
 - Relevant State regulatory guidelines.
- Gauging of groundwater level in monitoring wells prior to collection of samples (refer to **Table 1** below, and **Figure 2** in **Appendix A** for specific locations).
- Collection of groundwater samples at 40 locations including 31 on-Base locations, and nine off-Base locations (refer to **Table 1** below, and **Figure 2** in **Appendix A**).
- Collection of co-located surface water and sediment samples at 31 locations including 17 on-Base and 13 off-Base locations (refer to **Table 2** and **Table 3** below, and **Figure 3** in **Appendix A**). It is noted that one surface water location was dry during the sampling round and no surface water sample was collected from this location.
- Collection of intra- and inter-laboratory duplicate samples at a rate of one in 10 primary samples, one rinsate sample per fieldwork day, and one trip-blank submitted to the laboratory per sample batch.
- Analysis of all samples for a suite of 28 PFAS analytes at the standard limit of reporting (LOR).
- Data management of all OMP field and laboratory data in the Defence ESdat database.
- Preparation of this Sampling Event Factual Report.

Table 1 Groundwater Sampling Locations

Source Area	Monitoring Well ID
Eastern PFAS Contamination Area	MW018, MW114, MW115, MW116, MW139
Former B Squadron	MW135
Former Fire Station	MW105, MW128
Former Fire Training Area	MW131
Former Helicopter Squadron	MW102
Lavarack Golf Course and Sporting Fields	MW065, MW120, MW121, MW122, MW123I, MW123S
Monocell	MW072, MW074, MW106
Stockpile Designated Area 2	MW141
Suspected Aqueous Film Forming Foam (AFFF) Disposal Area	MW101
Top, Middle and Lower Dams	MW138

Source Area	Monitoring Well ID
Base Boundary – On-Base	MW002, MW003, MW117D, MW117S, MW118, MW119, MW124, MW125I, MW125S
Off-Base	MW205S, MW212, MW217, MW220S, MW226, MW232, MW233, MW235S, MW236S

Table 2 Surface Water Sampling Locations

Source Area	Surface Water Location ID
Eastern PFAS Contamination Area	SW119, SW121
Former Fire Station	SW109, SW110
Lavarack Golf Course and Sporting Fields	SW129, SW130, SW150
Top Middle and Lower Dams	SW139, SW140, SW144
Remaining on-Base	SW113, SW120
Base Boundary	SW126, SW128, SW132, SW133 (dry at the time of sampling), SW134, SW135, SW136
Off-Base	SW203, SW205, SW211, SW212, SW217, SW220, SW227, SW232, SW233, SW242, SW243, SW244, SW245

Table 3 Sediment Sampling Locations

Source Area	Sediment Location ID
Eastern PFAS Contamination Area	SD119, SD121
Former Fire Station	SD109, SD110
Lavarack Golf Course and Sporting Fields	SD129, SD130,
Top Middle and Lower Dams	SD139, SD140, SD144
Remaining on-Base	SD113, SD120
Base Boundary	SD126, SD128, SD132, SD133, SD134, SD135, SD136
Off-Base	SD203, SD205, SD211, SD212, SD217, SD220, SD227, SD232, SD233, SD242, SD243, SD244, SD245

3.0 Methodology

The methodology used for the March/April 2021 sampling event was in general accordance with the SAQP (AECOM, 2021) and is summarised below. Deviations from the SAQP are discussed in **Section 3.6**.

3.1 Groundwater Sampling Methodology

The groundwater sampling methodology is outlined in **Table 4** below.

Table 4 Groundwater Sampling Methodology

Item	Details
Groundwater Gauging	<p>Depth to groundwater was measured at the beginning of the sampling round to facilitate gauging all wells within the shallow aquifer on the same day.</p> <p>The depth to groundwater was also measured in each monitoring well immediately prior to the collection of groundwater samples.</p>
Water Quality Parameters	<p>Temperature, electrical conductivity (EC), dissolved oxygen (DO), oxidation reduction potential (ORP), pH and observations of water quality were recorded using a calibrated water quality meter. Equipment calibration certificates for the water quality meter are provided in Appendix F.</p>
Sampling Methodology	<p>Groundwater samples were collected from all monitoring wells using no-purge methodology HydraSleeves™, which were installed within the screened interval of each well (based on a review of the well construction log) for a minimum of 24 hours prior to the sampling round (as detailed in Table T1, Appendix B). For wells without available construction details, HydraSleeves™ were installed at the bottom of the well, consistent with the screened interval for wells installed in the same aquifer. Once sampling was completed, new HydraSleeves™ were deployed in preparation for the next sampling round, with the exception of wells where tree roots could prohibit the retrieval of the HydraSleeves™ in future rounds, as detailed in Table 15. HydraSleeves™ were not installed in monitoring wells which are also sampled as part of the routine Water Quality Monitoring Program.</p>
Quality Assurance/Quality Control (QA/QC) Samples	<p>Field QA/QC samples collected included intra-laboratory duplicate and inter-laboratory duplicate samples (i.e. splits), and rinsate samples. Refer to Appendix C for assessment of QA/QC sample data.</p>
Sample Analysis	<p>All primary samples were submitted for PFAS suite analysis using the standard levels of detection.</p> <p>ALS Environmental Pty Ltd (ALS) Brisbane, Queensland was used as the primary laboratory. The National Measurement Institute (NMI) of Sydney, NSW was used as the secondary laboratory. ALS and NMI methods for analyses of PFAS in are certified by the National Association of Testing Authorities (NATA).</p> <p>Chain of Custody Forms are presented in Appendix D. Laboratory certificates are presented in Appendix E.</p>

3.2 Surface Water Sampling Methodology

The surface water sampling methodology is outlined in **Table 5** below.

Table 5 Surface Water Sampling Methodology

Item	Details
Water Quality Parameters	Temperature, electrical conductivity (EC), dissolved oxygen (DO), oxidation reduction potential (ORP), pH and observations of water quality were recorded using a calibrated water quality meter. Equipment calibration certificates for the water quality meter are provided in Appendix F .
Sampling Methodology	Samples were collected from immediately below the water surface, with either a sampling pole or directly into laboratory supplied sample containers, to minimise collection of sediment or floating materials in the samples. At each location, a new, laboratory-supplied container was lowered into the water with the cap immediately applied once the container was full. Where the waterway could not be accessed from the bank a telescopic sampler with a decontaminated stainless-steel scoop was used to collect the sample. The sample was immediately transferred into the new laboratory supplied container.
Quality Assurance/Quality Control (QA/QC) Samples	Field QA/QC samples collected included intra-laboratory duplicate and inter-laboratory duplicate samples (i.e. splits), and rinsate samples. Refer to Appendix C for assessment of QA/QC sample data.
Sample Analysis	All primary samples were submitted for PFAS suite analysis using the standard levels of detection. ALS Environmental Pty Ltd (ALS) Brisbane, Queensland was used as the primary laboratory. The National Measurement Institute (NMI) of Sydney, NSW was used as the secondary laboratory. ALS and NMI methods for analyses of PFAS in are certified by the National Association of Testing Authorities (NATA). Chain of Custody Forms are presented in Appendix D . Laboratory certificates are presented in Appendix E .

3.3 Sediment Sampling Methodology

The sediment sampling methodology is outlined in **Table 6** below.

Table 6 Sediment Sampling Methodology

Item	Details
Sampling Methodology	Samples representative of potentially deposited sediments were collected from within the water body (if possible) using a piston sediment sampler or with a trowel from the base of drains (where possible). Samples were collected from the surface of the sediment up to a depth of 0.1 m, where this depth was achievable. At each location, a new laboratory supplied container was used for each sample.
Logging	Sediment characteristics were recorded for each sample and are summarised in Table T5, Appendix B .
Quality Assurance/Quality Control (QA/QC) Samples	Field QA/QC samples collected included intra-laboratory duplicate and inter-laboratory duplicate samples (i.e. splits), and rinsate samples. Refer to Appendix C for assessment of QA/QC sample data.
Sample Analysis	All primary samples were submitted for PFAS suite analysis using the standard levels of detection. ALS Environmental Pty Ltd (ALS) Brisbane, Queensland was used as the primary laboratory. The National Measurement Institute (NMI) of Sydney, NSW was used

Item	Details
	<p>as the secondary laboratory. ALS and NMI methods for analyses of PFAS in are certified by the National Association of Testing Authorities (NATA).</p> <p>Chain of Custody Forms are presented in Appendix D. Laboratory certificates are presented in Appendix E.</p>

3.4 Adopted Screening Criteria

Adopted screening criteria references national guidance in the form of the PFAS National Environmental Management Plan (NEMP), Defence estate and environmental strategies, and Defence PFAS-specific strategies and guidance. Guidance documents used to assess the dataset include the following:

- PFAS NEMP, (HEPA 2020).
- Department of Health (DoH), 2019. *Health Based Guidance Values for PFAS for use in site investigations in Australia*. April 2017 [updated September 2019].
- National Health and Medical Research Council (NHMRC), 2019. *Guidance on PFAS in Recreational Water*. August 2019 (NHMRC 2019).
- *National Environment Protection (Assessment of Site Contamination) Measure 1999, Schedule B1, as amended in 2013* (ASC NEPM).

In accordance with the OMP (Department of Defence, 2020) and SAQP (AECOM, 2021), the adopted PFAS screening criteria to assess the data generated as part of the OMP are presented in **Table 7** below.

Table 7 Summary of Adopted Screening Criteria

Pathway	Compound	Criteria	Comment / Reference
Human Health Receptors			
Drinking Water	PFOS + PFHxS	0.07 µg/L	The values are from the PFAS NEMP (HEPA, 2020). Where the guideline value refers to the sum of PFOS + PFHxS, this includes PFOS only, PFHxS only and the sum of the two (HEPA, 2020). <i>All off base groundwater results will be compared to these criteria. as well as one surface water location which is within Townsville's emergency drinking water supply.</i>
	PFOA	0.56 µg/L	
Recreational use – surface water	PFOS + PFHxS	2 µg/L	The values are from the PFAS NEMP (HEPA, 2020). <i>All surface water results will be compared to these criteria.</i>
	PFOA	10 µg/L	
Ecological Receptors			
Freshwater and marine water (95% species protection values)	PFOS	0.13 µg/L	The values are from the PFAS NEMP (HEPA, 2020). <i>All surface water and groundwater results will be compared to these criteria.</i>
	PFOA	220 µg/L	

There are no human health or ecological guideline values available for sediment.

3.5 Data Quality Objectives and Data Validation

The data quality objectives and data quality indicators adopted for these works are presented in the SAQP (AECOM, 2021).

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

One rinsate blank returned detections of PFOS and PFHxS. Sample SW135 was the last sample collected at the end of the fieldwork day and concentrations in the surface water sample were higher than previously reported. There is a risk of cross-contamination for surface water samples collected on 29 March 2021. Field decontamination protocols will be reviewed prior to the next sampling event.

The data validation procedure employed in the assessment of the field and laboratory QA/QC data indicated that the reported analytical results are representative of the sample locations and that the overall quality of the analytical data produced is acceptably reliable for the purpose of this report.

All data collected during this event has been reviewed and uploaded to the Defence ESdat database in accordance with DCMM (Defence, 2018 as amended 2019) Annex L requirements (Department of Defence, 2019).

3.6 Deviations from the SAQP

Table 8 lists the deviations from the SAQP (AECOM, 2021) during this sampling round.

Table 8 Deviation from the SAQP during Wet Season 2021 Sampling Event

SAQP	Wet Season Sampling 2021
Collection of surface water at 31 co-located surface water and sediment locations	SW133 was dry during the sampling round and no surface water could be sampled, this is not expected to have an impact on the interpretation of data.
Collection of surface water and sediment samples at SW137/SD137 as presented in Figure 3 of the SAQP (AECOM, 2021).	SW137/SD137 was nominated as a sampling location in the PMAP (Department of Defence, 2020), to be collected from the top dam. Following the main round of sampling it was identified that this sampling point was represented in the incorrect location in the SAQP due to an issue with location data held in ESdat. The SAQP has been updated to reflect this change following the sampling event. The correct location in the top dam was identified and renamed SW144/SD144 in ESdat. This was subsequently sampled on 13/05/2021 with approval from the Defence project manager and reference to SW137/SD137 removed from this report, this is not expected to impact the interpretation of data.
Collection of duplicate and triplicate samples at a rate of one in ten primary samples for sediment.	Three out of a required four pairs of duplicate and triplicate samples collected and analysed. See Appendix C . All sediment relative percentage differences for duplicate and triplicate samples analysed were within control limits and this is not considered to impact interpretation of data.
Collection of rinsate samples at a rate of one per day of sampling.	One rinsate blank, collected on 29 March 2021, returned detections of PFOS and PFHxS, as discussed in Section 3.5 . Two surface water locations (SW135 and SW139) were resampled on 22 June 2021 to verify concentrations due to the risk of cross-contamination for surface water samples collected on 29 March 2021.

SAQP	Wet Season Sampling 2021
	A third surface water location (SW120) was proposed for resampling, however no surface water was present on 22 June 2021.
All surface water samples are to be analysed against the drinking water guidelines outlined in the PFAS NEMP (HEPA, 2020)	One surface water location which is within Townsville's emergency drinking water supply will be compared to the drinking water guideline (HEPA, 2020) and all others are to be assessed against the recreational guideline for surface waters as outlined in the PFAS NEMP (HEPA, 2020). The SAQP will be amended to reflect the correct screening criteria allocation for surface water locations.

4.0 Field Observations and Results

The main 2021 wet season sampling event was completed between 26 March and 1 April 2021, commencing with groundwater gauging and deployment of HydraSleeves™. A supplementary sampling event was completed on 13 May 2021 to collect samples from newly identified surface water location SW144/SD144. The results are summarised in the following sections.

Details on weather conditions and estate management works or training activities during the sampling event are recorded in **Table 9**.

Table 9 Weather Conditions and Estate Activities at Time of Sampling

Item	Observations
Weather Conditions	Weather was overcast and humid during the majority of sampling event with periods of light rain.
Estate Management Works or Training Activities	No estate management works, or training exercises impacted the sampling of groundwater, surface water and sediment locations.

4.1 Groundwater

4.1.1 Observations and Field Measurements

Table 10 Groundwater Observations and Field Measurements

Item	Observations
Access	All monitoring wells were accessible.
Monitoring Well Network	<p>The headworks at the following monitoring wells were noted to be damaged during the 2021 wet season sampling event:</p> <ul style="list-style-type: none"> The monument lid did not close fully at MW124. This well was able to be sampled during this sampling event. This well was capped on arrival and departure. MW115 was bent at approximately 0.75 metres below top of casing (mBTOC). The well was able to be sampled in this sampling event using a HydraSleeve™ without a collar. MW003 was bent at ground level. The well was able to be sampled in this sampling event using a HydraSleeve™ without a collar. Concrete around the monument of MW125S was cracked. Well casing was unaffected and the well was able to be sampled in this sampling event. The ground had washed away at MW121 and the monument was loose. The well casing was unaffected and the well was able to be sampled in this sampling event. Only one of two bolts on MW212 could be secured. This well was able to be sampled during this sampling event. There is no well cap on MW226. This is an irrigation bore which is currently covered by a plastic kennel within a small fenced compound. The HydraSleeve™ in this well was installed during this sampling event, limiting the time in which the sample could be affected by surface water infiltration. The plastic kennel provided some protection to the well providing shelter from rainfall. <p>These damaged headworks are unlikely to impact the data collected or the interpretation of data.</p>
Field Observations	<p>Groundwater from 11 monitoring well locations (MW003, MW018, MW115, MW117D, MW120, MW123S, MW128, MW138, MW139, MW212 and MW232) had a sulphurous odour.</p> <p>Groundwater colour ranged from clear to black (MW220S).</p>

Item	Observations
	<p>No other visible or olfactory indications of contamination were observed during the sampling of the monitoring wells.</p> <p>MW131, MW101 and MW235S were blocked with tree roots. The blockages were removed with a decontaminated steel bailer and the HydraSleeve™ was subsequently deployed. HydraSleeves™ were not redeployed following sampling. Floating organics were excluded from the sample due to sampling from a HydraSleeve™. Field observations are presented Table T1 in Appendix B.</p>
Depth to Groundwater	Depth to groundwater ranged between 0.491 and 5.564 metres below top of casing (mBTC). Groundwater elevations were between 1.232 and 26.012 metres Australian Height Datum (mAHD). Groundwater gauging data are presented in Table T1 in Appendix A .
Groundwater Flow Direction	Groundwater contours and inferred groundwater flow directions in March/April 2021 are shown on Figure 4 in Appendix A . The inferred local groundwater flow direction is to the east-north-east.
Water Quality Parameters	<p>Groundwater water quality parameters were measured at the time of sampling. The readings are presented in Table T1 in Appendix B and are summarised below:</p> <ul style="list-style-type: none"> • DO results ranged between 0.09 mg/L (MW101) to 7.56 mg/L (MW125I) indicating poorly to well oxygenated conditions. • EC ranged from 516 µS/cm (MW122) to 42,007 µS/cm (MW232) fresh to saline conditions. • pH ranged from 6.08 (MW217) to 8.68 (MW102). pH results generally indicated slightly acidic to slightly alkaline conditions. • ORP ranged from -144.2 mV (MW018) to 200.1 mV (MW116) indicating strongly reducing to mildly oxidising conditions. • Temperature ranged from 26.2°C (MW220S) to 33.9°C (MW139).

4.1.2 Groundwater Analytical Results

Of the 40 groundwater wells sampled during this event, 36 samples reported concentrations of PFAS compounds above the laboratory LOR. The PFAS groundwater analytical results from this sampling event are presented in **Table T2** in **Appendix B**. Four off-Base samples exceeded the adopted drinking water guideline for PFOS+PFHxS and 19 samples, both on and off-Base, exceeded the adopted ecological guidelines for PFOS (**Table T2, Appendix B**).

Historical groundwater results presented in **Table T7, Appendix B**. There were no first-time detections or first-time exceedances of guideline values detected in this sampling event for groundwater samples. Groundwater sampling results were within the same order of magnitude as historically reported concentrations. Results were generally within the historical range of concentrations with the exception of MW114, MW139, MW135, MW105, MW128, MW120, MW072, MW138, MW002, MW117D, MW119, MW235S

4.2 Surface Water

4.2.1 Observations and Field Measurements

Table 11 Surface Water Observations and Field Measurements

Item	Observations
Access	<p>All surface water locations were accessible during the sampling event.</p> <p>SW133 was dry at the time of sampling and SW120 was dry at the time of follow up sampling, no surface water was collected from these locations.</p>

Item	Observations
Field Observations	<p>Surface water from 15 locations (SW109, SW110, SW119, SW121, SW128, SW129, SW130, SW136, SW139, SW140, SW203, SW205, SW217, SW233 and SW242) had an organic odour.</p> <p>Surface water from one location (SW232) had an odour of seawater.</p> <p>Surface water from one location (SW110) had a slight biological sheen on the surface.</p> <p>No other visible or olfactory indications of contamination were observed during the sampling of the surface water locations.</p> <p>Field observations are presented Table T3 in Appendix B.</p>
Water Quality Parameters	<p>Surface water quality parameters were measured at the time of sampling. The readings are presented in Table T3 in Appendix B and are summarised below:</p> <ul style="list-style-type: none"> • DO results ranged between 2.72 mg/L (SW232) and 11.68 mg/L (SW135) indicating moderately to well oxygenated conditions. • EC ranged from 138.4 µS/cm (SW126) to 38,099 µS/cm (SW243) fresh to saline conditions. • pH ranged from 6.82 (SW110) to 9.92 (SW129). pH results generally indicated slightly acidic to alkaline conditions. • ORP ranged from 4.19 mV (SW220) to 380.5 mV (SW135) indicating mildly to strongly reducing conditions. • Temperature ranged from 22.9°C (SW139) to 36°C (SW136).

4.2.2 PFAS Surface Water Analytical Results

Of the 30 surface water samples, 25 samples reported concentrations of PFAS compounds above the laboratory LOR. The PFAS surface water analytical results from this sampling event are presented in **Table T4** in **Appendix B**. PFOS concentrations in 14 samples exceeded the adopted ecological guidelines and PFOS+PFHxS concentrations in five samples exceeded the adopted recreational use guidelines (**Table T4, Appendix B**).

An additional two surface water samples were collected during follow up sampling, both samples reported concentrations of PFAS compounds above the laboratory LOR and PFOS+PFHxS concentrations exceeding the adopted recreational use guideline. The concentration of PFOS in one sample also exceeded the adopted ecological guidelines.

It is noted that concentrations reported from the follow up sampling confirmed concentrations detected at these locations on 29 March 2021, therefore the concentrations detected on 29 March 2021 are reported as the first-time detections and new exceedances of guidelines, as presented in **Table 12** below.

Historical surface water results presented in **Table T8, Appendix B**. First-time detections and first-time exceedances of guideline values are also presented on **Figure 5A** in **Appendix A**.

Surface water sampling results were within the same order of magnitude as historically reported concentrations with the exception of SW109. Results were generally within the historical range of concentrations with the exception of SW109, SW129, SW130, SW139, SW120, SW132, SW217, SW220, SW233 and SW242.

Table 12 First-time Detections of PFAS or New Exceedances of Guidelines in Surface Water

Type	Surface Water Locations	PFOS concentration (µg/L)		PFOA concentration (µg/L)		PFOS+PFHxS concentration (µg/L)	
		Mar/Apr 2021	Historical maximum	Mar/Apr 2021	Historical maximum	Mar/Apr 2021	Historical maximum
First-time detections of PFOA or PFOS+PFHxS in surface water on-Base	SW130	N/A ¹		0.03	<0.01	1.27	0.33
	SW135			0.07	<0.01	5.64	0.68
First-time detections of PFOA or PFOS+PFHxS in surface water off-Base	There were no first-time detections in off-Base surface water.						
First-time exceedance of the NEMP (HEPA, 2020) 95% species protection ecological guideline values or recreational water guidelines in surface water on-Base	SW139	1.56	1.1	0.07	0.04	2.4	1.87
	SW132	1.39	1.5	0.08	0.08	2.55	1.12
	SW135	3.62	0.52	0.07	<0.01	5.64	0.68
First-time exceedance of guidelines in surface water off-Base	There were no first-time exceedances of guidelines in off-Base surface water.						

Concentrations have been rounded to two decimal places.

¹ First time detections of PFOS have not been included as per *PFAS OMP Factual Report Guidance*, v0.2, May 2021 (Department of Defence, 2021)

² Blue cells denote first time detection above LOR.

³ Yellow cells denote new exceedance of guideline values.

4.3 Sediment

4.3.1 Observations and Field Measurements

Table 13 Sediment Observations

Item	Observations
Access	All sediment sampling locations were accessible.
Field Observations	Sediment at 14 locations (SD121, SD129, SD130, SD134, SD135, SD136, SD139, SD140, SD144, SD217, SD220, SD232, SD242 and SD243) had an organic odour. No other visible or olfactory indications of contamination were observed during the sampling of sediment locations. Sediment logging data are presented in Table T5, Appendix B .

4.3.2 PFAS Sediment Analytical Results

Of the 31 sediment samples, 28 samples reported concentrations of PFAS compounds above the laboratory LOR. The PFAS sediment analytical results from this sampling event are presented in **Table T6** in **Appendix B**.

Historical sediment results presented in **Table T9, Appendix B**. First-time detections of PFOA and PFOS+PFHxS in sediment are presented in **Table 14** below and on **Figure 5B** in **Appendix A**.

Sediment sampling results were within the same order of magnitude as historically reported concentrations with the exception of SD119. Results were generally within the historical range of concentrations with the exception of SD119, SD135, SD136, SD205, SD233, SD242 and SD243.

There are no human health or ecological guideline values available for sediment.

Table 14 First-time Detections of PFAS in Sediment

Sediment Locations	PFOA concentration (mg/kg)	PFOS+PFHxS concentration (mg/kg)
SD120	<0.0002	0.0014
SD139	0.0005	0.894
SD140	0.0004	0.0547
SD144	<0.0010	0.361^
SD205	<0.0002	0.007
SD211	<0.0002	0.0015
SD212	<0.0002	0.0005#
SD233	0.0002	0.029
SD243	<0.0002	0.0009

Concentrations have been rounded to four decimal places.

*Blue cells denote first time detection above LOR.

^Location SD144 was sampled for the first time during this sampling event. This first-time detection is only data available for this location.

#Location SD212 was sampled in the previous monitoring round and excluded from the report due to landholder confidentiality issues. Concentrations of PFOS+PFHxS were detected above LOR in October 2020 however this is the first time results have been included in the factual report so this is identified here as a first-time detection.

5.0 Summary and Next Sampling Event

5.1 Summary of Monitoring Event

The wet season monitoring event was completed between 26 March 2021 and 13 May 2021 at the Base and surrounding suburbs, including sampling of groundwater, surface water and sediment. **Table 15** summarises findings of the March/April 2021 sampling event and the recommended actions.

Table 15 Summary of Sampling Event

Item	Comment	Recommended Actions
<u>Groundwater:</u> Access to sampling locations and monitoring well network condition.	All of the 40 monitoring well locations were accessible and able to be sampled.	Ongoing monitoring in accordance with the OMP.
	The casing of MW003 and MW115 was bent below ground level. A sample was collected using a HydraSleeve™ without a collar.	Continue monitoring using a HydraSleeve™ without a collar.
	The monument of MW121 was loose due to a wash out of the ground below the concrete plinth. The concrete plinth at the base of the monument of MW125S is cracked.	Repair concrete plinth on MW121 and MW125S.
	Data loggers were present in the following off-Base wells: <ul style="list-style-type: none"> MW205S MW232 MW235S MW236S. Data loggers were removed to deploy HydraSleeves™ and replaced in the well immediately, on top of the HydraSleeve™. The data loggers were removed a second time during retrieval of the HydraSleeves™ and immediately replaced. A note was left for the owner of the data loggers in each well collar detailing date and time of removal and contact information. HydraSleeves™ were not redeployed in wells with data loggers.	Defence has advised that the owner of the data loggers is unknown. It is recommended that the data loggers be removed and the data downloaded. AECOM to deploy HydraSleeves™ in these wells at the beginning of the subsequent sampling round.
<u>Sediment/Surface Water:</u> Access to sampling locations.	All 31 surface water and sediment locations were accessible. SW133 was dry at the time of sampling and SW120 was dry at the time of follow up sampling, no surface water sample was able to be collected during this sampling round.	Continue monitoring in accordance with the OMP.
<u>Analytical Results</u>	PFAS compounds were detected above laboratory LOR in 36 groundwater samples, 25 surface water samples and 28 sediment samples.	Continue monitoring in accordance with the OMP.
<u>Data Validation</u>	One rinsate blank returned detections of PFOS and PFHxS.	Field decontamination protocols will be reviewed prior to the next sampling event.

Item	Comment	Recommended Actions
<p><u>First-time detections of PFOA or PFOS+PFHxS</u></p>	<p><u>Groundwater:</u> There were no first-time detections of PFOS, PFOA or PFOS+PFHxS in groundwater.</p> <p><u>Surface Water:</u> Results showed first time detection of PFOA at two on-Base sampling locations (SW130 and SW135) during this sampling round.</p> <p><u>Sediment:</u> PFOA was detected for the first time at two on-Base (SD139 and SD140) and one off-Base (SD233) sediment sampling location during this sampling round.</p> <p>PFOS+PFHxS was detected for the first time at two on-Base (SD120 and SD144) and four off-Base (SD205, SD211, SD212 and SD243) sediment sampling locations during this sampling round.</p>	<p>Continue monitoring in accordance with the OMP.</p>
<p><u>First-time exceedances of screening criteria for PFOS, PFOA or PFOS+PFHxS</u></p>	<p><u>Groundwater:</u> There were no first-time exceedances of guidelines detected in groundwater.</p> <p><u>Surface Water:</u> Three on-Base sampling locations (SD139, SD132 and SD135) showed first-time exceedance of the NHMRC (2019) guideline for recreational water.</p>	<p>Continue monitoring in accordance with the OMP.</p>

5.2 Upcoming Sampling Events

The next biannual sampling event is scheduled for late August 2021.

5.3 Upcoming Annual Interpretive Report

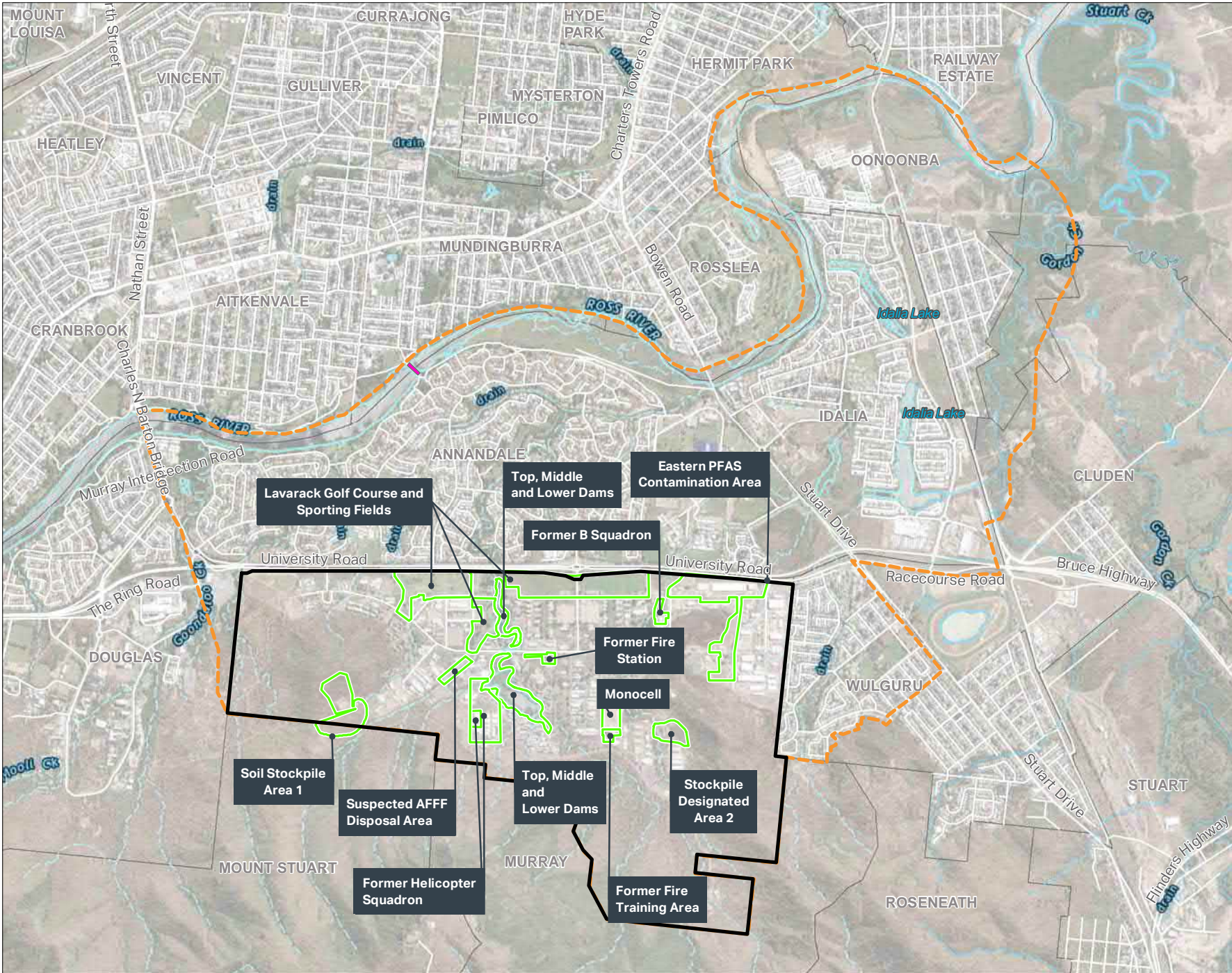
The next annual interpretive report is scheduled for June 2021.

6.0 References

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- ANZG. (2018). *Australian and New Zealand Guidelines for Fresh and Marine Water Quality*.
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- National Environment Protection Council (NEPC). (1999). *National Environment Protection (Assessment of Site Contamination) Measure, Schedule B2: Guideline on Site Characterisation (as amended in May 2013) [ASC NEPM]*.
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Appendix A

Figures



Legend

- Property Boundary
- Management Area
- Aplin's Weir
- Source Areas
- Watercourses

**FIGURE 1:
LAVARACK BARRACKS
LOCATION AND
SOURCE AREAS**

PROJECT NAME:
PFAS OMP
REPORT NAME:
PFAS OMP – Lavarack Barracks
(0229) Townsville,
Sample Event Factual Report
April 2021
CLIENT NAME:
Department of Defence
PROJECT NUMBER:
60612487

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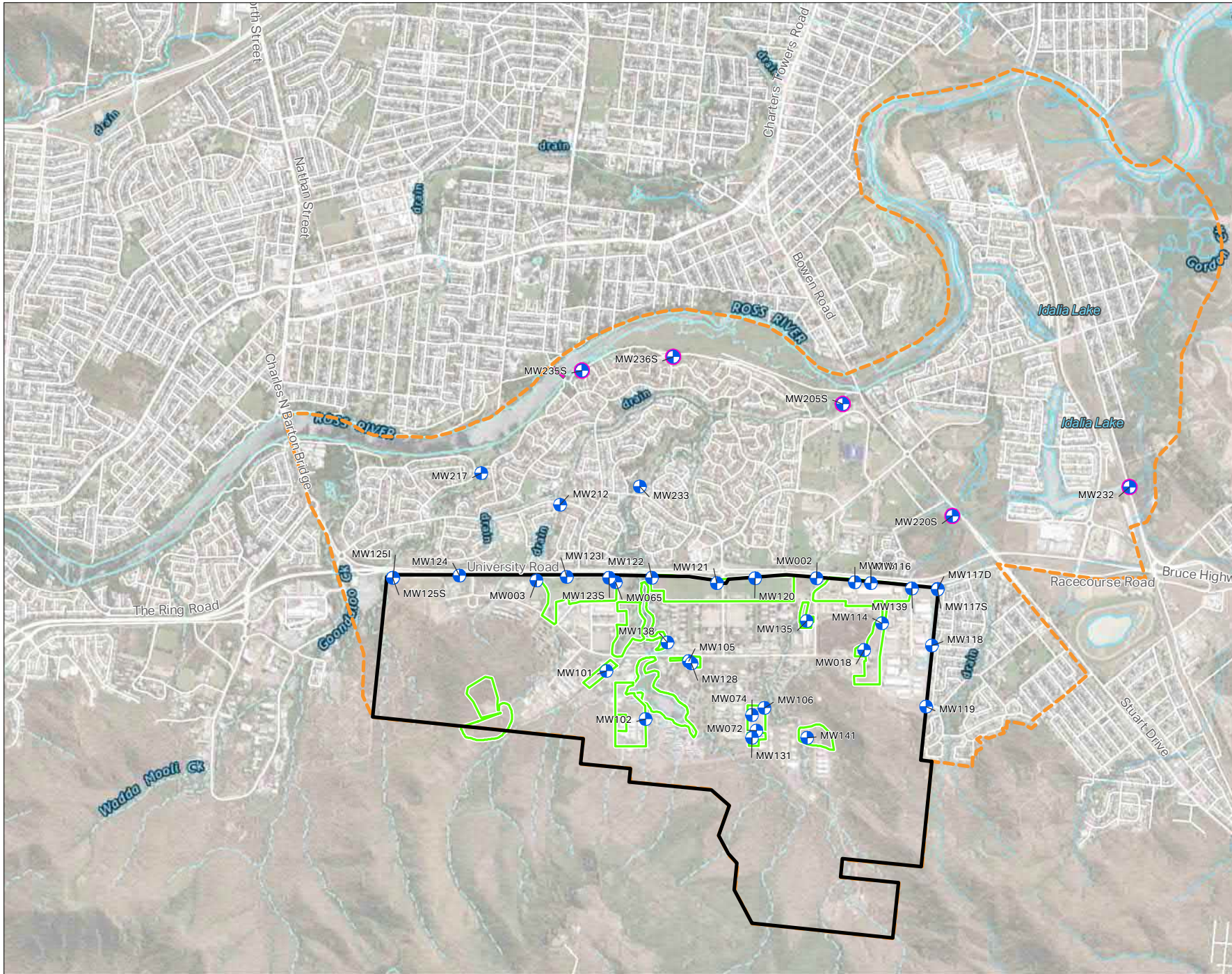
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Legend

- Property Boundary
- Management
- Aplin's Weir
- Source Areas
- Watercourses
- Groundwater Sample Location
- Tidally Influenced Groundwater Sample Location



**FIGURE 2:
GROUNDWATER
MONITORING LOCATIONS**

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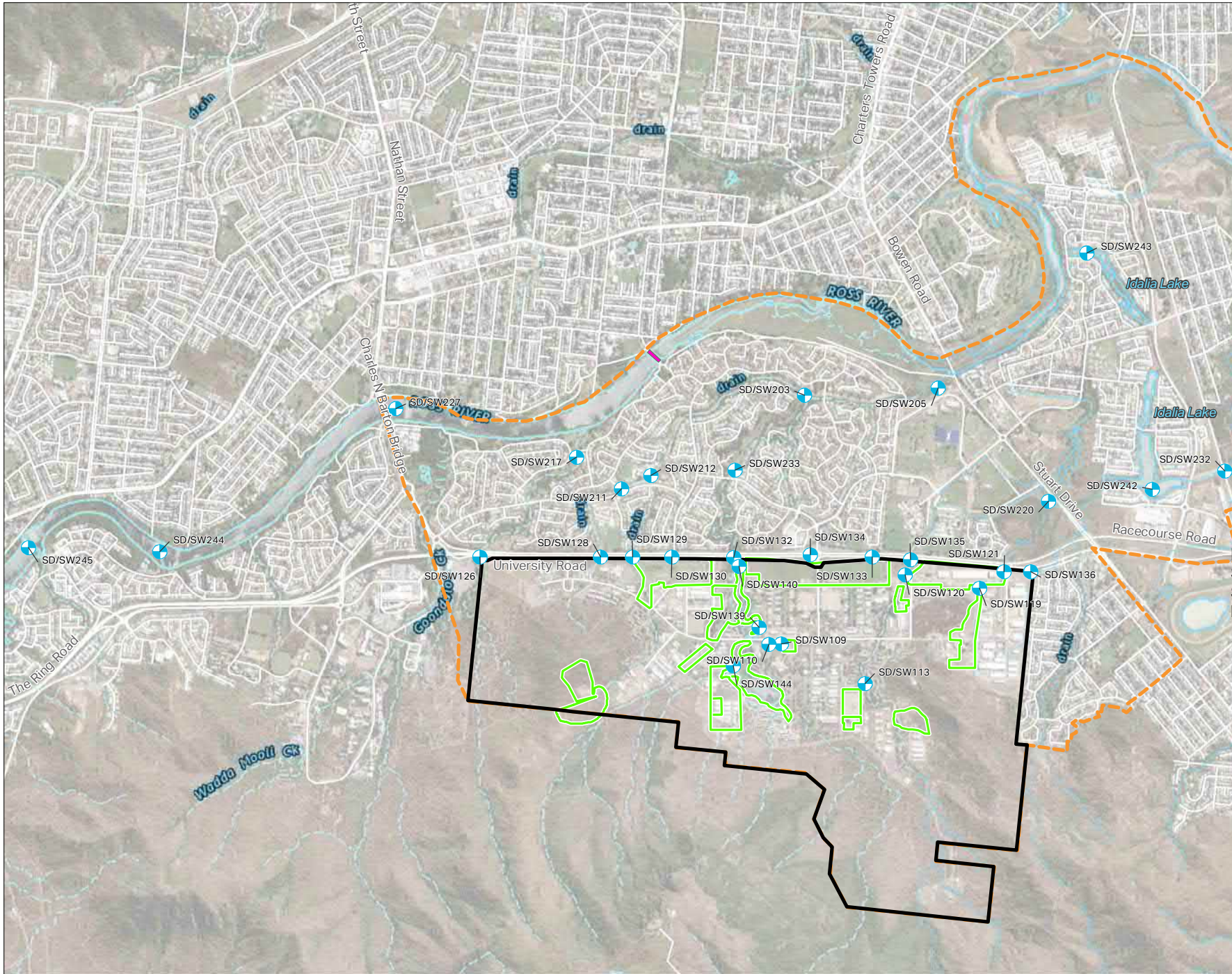
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Legend

- Property Boundary
- Management Area
- Aplin's Weir
- Source Areas
- Watercourses
- Co-located Surface Water and Sediment Sample Location



**FIGURE 3:
SURFACE WATER AND
SEDIMENT MONITORING
LOCATIONS**

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Legend

- Property Boundary
- Management Area
- Aplin's Weir
- Source Areas
- Watercourses
- Groundwater Contour
- Inferred Groundwater Flow Direction
- Groundwater Monitoring Well

Note: All elevations are in m AHD

**FIGURE 4:
INFERRED
GROUNDWATER
CONTOURS- SHALLOW
AQUIFER (ALLUVIUM)**

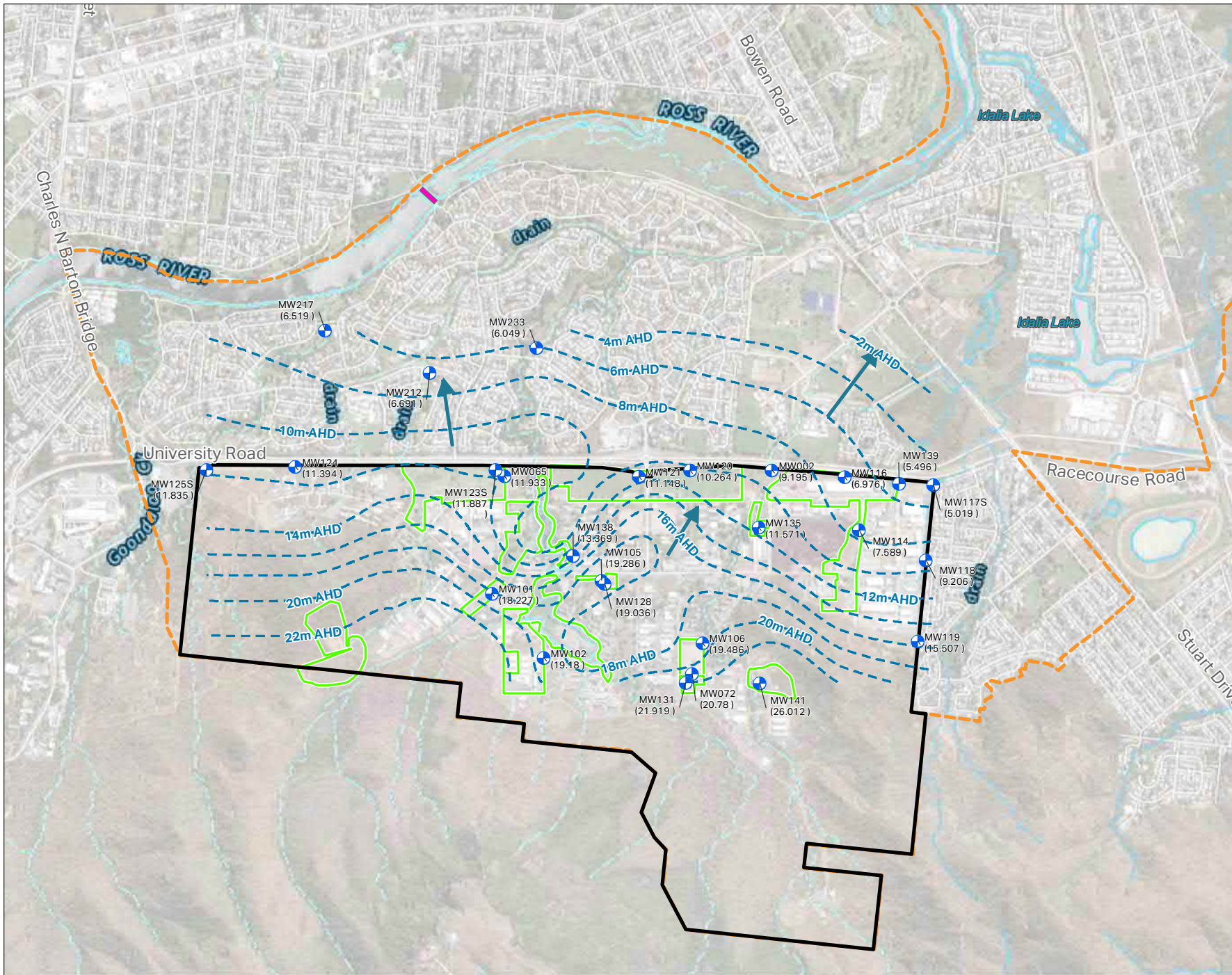
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Legend

- Property Boundary
- Management Area
- Aplin's Weir
- Source Areas

First time detection of PFOS+PFHxS or PFOA above laboratory limit of reporting

First time exceedance of guidelines for PFOS+PFHxS, PFOA or PFOS

**FIGURE 5A:
SURFACE WATER,
FIRST TIME PFAS
DETECTION AND
EXCEEDANCES OF
GUIDELINE VALUES**

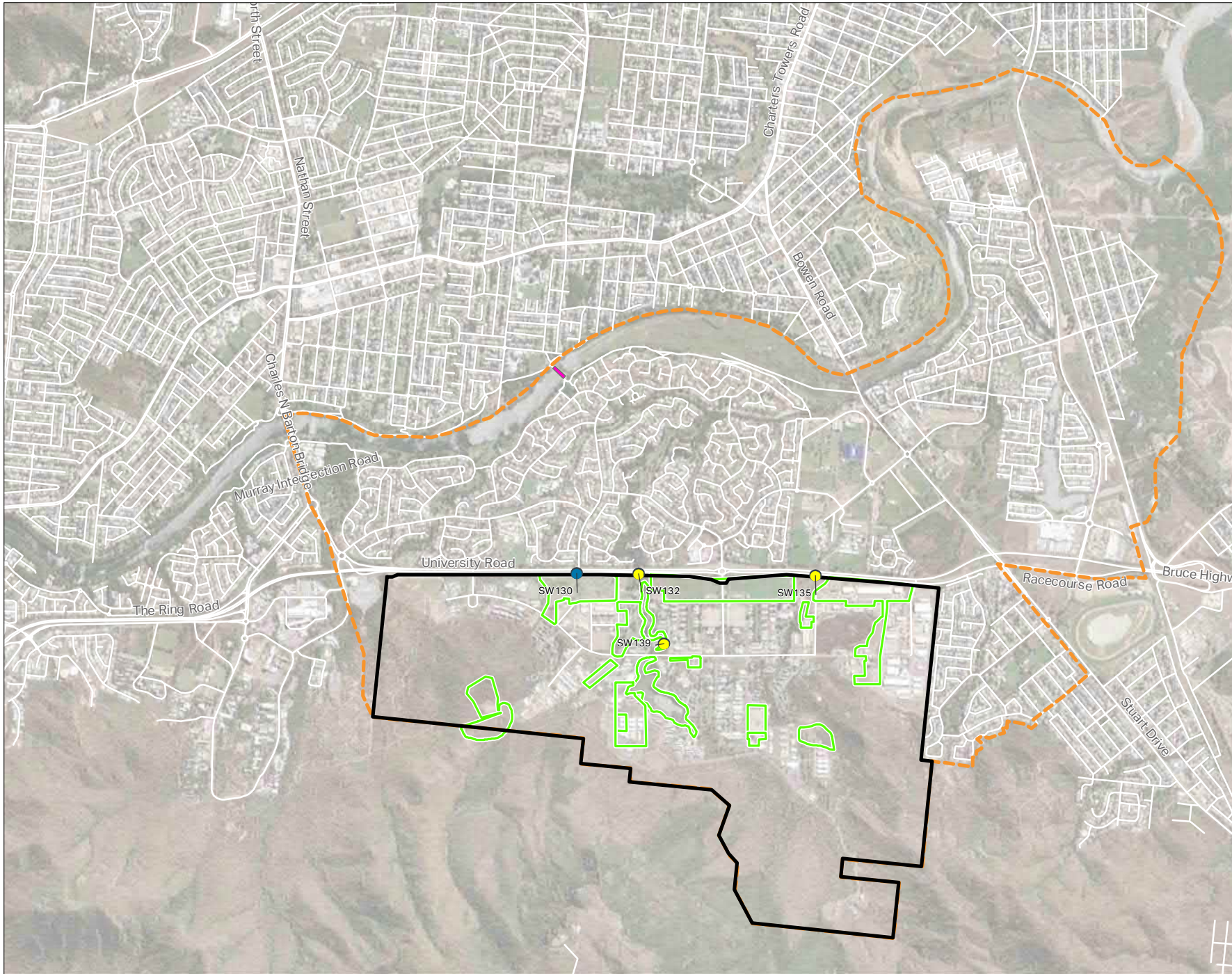
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Legend

- Property Boundary
- Management Area
- Aplin's Weir
- Source Areas

First time detection of PFOS+PFHxS or PFOA above laboratory limit of reporting



**FIGURE 5B:
SEDIMENT,
FIRST TIME PFAS
DETECTION
ABOVE LABORATORY
LIMIT OF REPORTING**

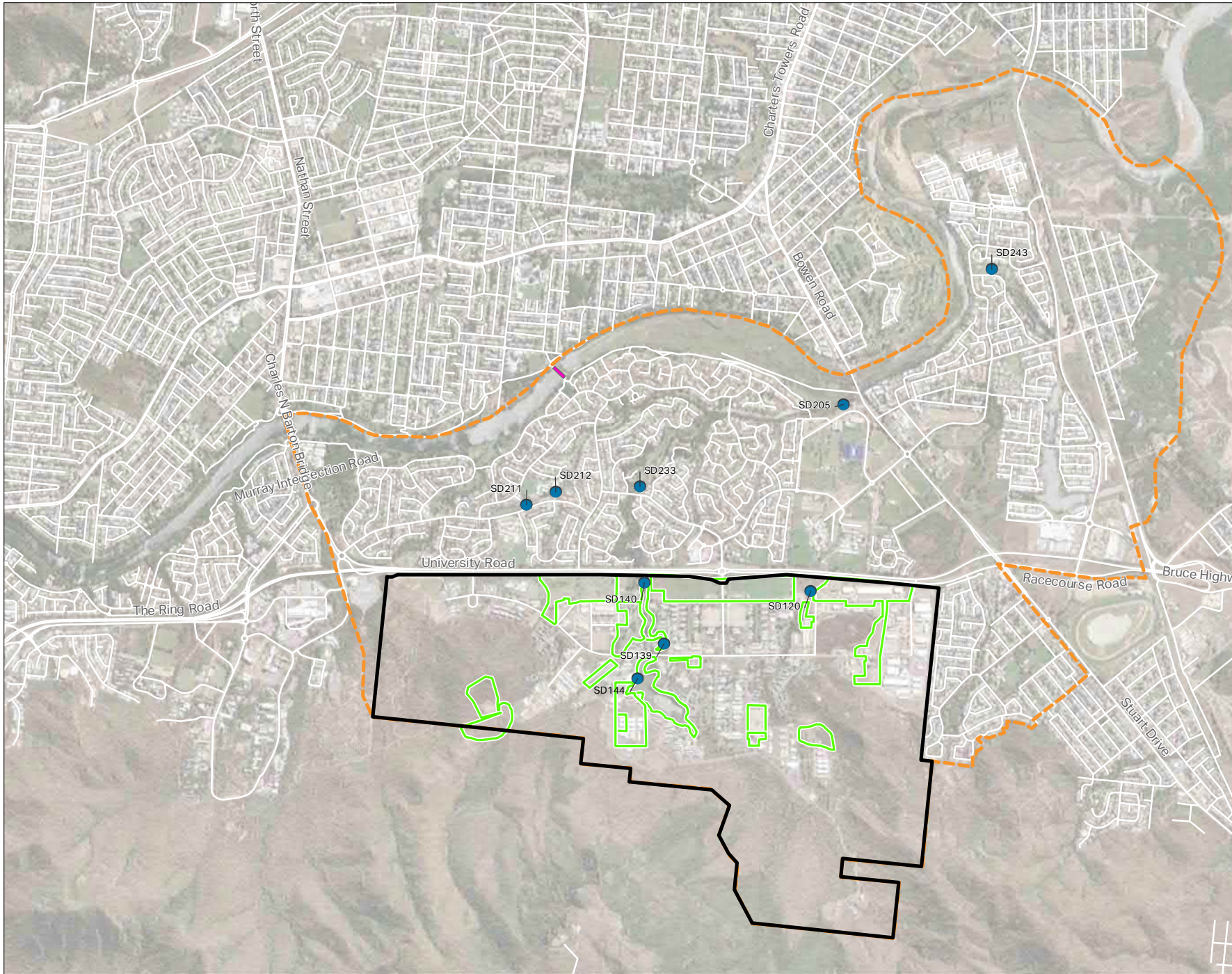
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REPORT NAME:
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Appendix B

Tables

Table T1: Groundwater Gauging and Water Quality Parameter Results

Location Code	HydraSleeve Installation Date	Sample Date	Well Screen Depths (mbtoc)	Well Depth (mbtoc)	Depth to Water (mbtoc)	HydraSleeve Installation Depth (mbTOC)*	TOC Elevation (mAHD)	Groundwater Elevation (mAHD)	Condition of Well	DO (mg/L)	EC (µS/cm)	pH	Eh/Redox (mV)	Temp (°C)	Turbidity	Water Colour	Odour	Sheen	Sample Method/Comments
Eastern PFAS Contamination Area																			
MW018	28/10/2020	31/03/2021	Not available in ESdat	9.05	2.439	7.75	12.43	9.991	Good	0.52	24824	6.98	-144.2	30.4	Low	Light Brown	Rotten egg smell (sulfurous)	No sheen	HydraSleeve
MW114	28/10/2020	31/03/2021	Not available in ESdat	6.68	1.311	5.38	8.9	7.589	Good	0.55	20110	7.54	36.3	29.9	Medium	Light Brown	No odour	No sheen	HydraSleeve
MW115	28/10/2020	31/03/2021	12.7 - 15.7	15.62	1.991	14.32	9.76	7.769	Damaged	0.23	966	8.06	76.5	29	Medium	Yellow	Rotten egg smell (sulfurous)	No sheen	HydraSleeve without collar. Casing bent approximately 0.75 mbTOC.
MW116	28/10/2020	31/03/2021	5 - 8	7.88	1.634	6.58	8.61	6.976	Good	0.88	15779	7.18	200.1	27.1	Low	Light Yellow	No odour	No sheen	HydraSleeve
MW139	28/10/2020	31/03/2021	2.8 - 5.8	5.76	1.034	4.46	6.53	5.496	Good	0.36	11009	6.79	31.4	33.9	Medium	Black / Grey	Rotten egg smell (sulfurous)	No sheen	HydraSleeve
Former B Squadron																			
MW135	28/10/2020	31/03/2021	3 - 6	6.365	3.389	5.065	14.96	11.571	Good	0.96	1381	6.63	68.2	32.8	Low	Light Brown	No odour	No sheen	HydraSleeve.
Former Fire Station																			
MW105	29/10/2020	31/03/2021	3 - 6	6.29	1.914	4.99	21.2	19.286	Good	0.13	4503	7.13	60.3	29.9	Turbid	Light Brown	No odour	No sheen	HydraSleeve.
MW128	29/10/2020	31/03/2021	2.6 - 5.6	5.47	2.244	4.17	21.28	19.036	Good	0.23	1400	7.45	43.5	29.1	Clear	Clear	Rotten egg smell (sulfurous)	No sheen	HydraSleeve.
Former Fire Training Area																			
MW131	28/10/2020	31/03/2021	5.4 - 8.4	8.7	3.321	7.4	25.24	21.919	Good	0.2	1229	6.8	-8.1	26.9	Low	Light Brown	No odour	No sheen	HydraSleeve.
Former Helicopter Squadron																			
MW102	29/10/2020	31/03/2021	8.5 - 14.5	9.81	3.69	8.51	22.87	19.18	Good	0.28	3350	8.68	62.3	28	Medium	Light Brown	No odour	No sheen	HydraSleeve.
Lavarack Golf Course & Sporting Field																			
MW065	29/10/2020	31/03/2021	1.5 - 6	6.5	1.487	5.2	13.42	11.933	Good	2.69	2597	7.82	-15.6	28.7	Low	Black / Grey	No odour	No sheen	HydraSleeve.
MW120	29/10/2020	31/03/2021	4 - 7	7.58	3.056	6.28	13.32	10.264	Good	0.48	4032	7.04	-103.2	28.6	Low	Yellow / Brown	Rotten egg smell (sulfurous)	No sheen	HydraSleeve.
MW121	29/10/2020	31/03/2021	2.5 - 5.8	6.39	2.522	5.09	13.67	11.148	Good	0.74	8351	7.33	31.5	28.3	Medium	Grey / Brown	No odour	No sheen	HydraSleeve. Casing and monument in good condition, ground washed away under concrete plinth, well wobbles.
MW122	29/10/2020	31/03/2021	9.3 - 16.3	16.9	3.903	15.6	14.44	10.537	Good	1.29	516	6.89	-88.5	27.3	Turbid	Grey / Brown	No odour	No sheen	HydraSleeve. Sediment settled in bottom of the HydraSleeve.
MW123I	28/10/2020	31/03/2021	5.8 - 8.8	10.11	2.427	8.81	14.04	11.613	Good	2.15	16993	6.71	-53.9	28.2	Low	Black / Grey	No odour	No sheen	HydraSleeve.
MW123S	29/10/2020	31/03/2021	1 - 5	5.6	1.593	4.3	13.48	11.887	Good	1.49	4139	7.59	-80.6	28.1	Low	Black / Grey	Rotten egg smell (sulfurous)	No sheen	HydraSleeve.
Monocell																			
MW072	26/03/2021	31/03/2021	Not available in ESdat	7.928	4.65	6.628	25.43	20.78	Good	0.67	2067	6.89	77.2	28.5	Low	Light Brown	No odour	No sheen	HydraSleeve.
MW074	26/03/2021	31/03/2021	Not available in ESdat	7.13	3.441	5.83	Not available in ESdat	N/A	Good	0.26	1996	7.03	82	29.8	Low	Clear	No odour	No sheen	HydraSleeve.
MW106	28/10/2020	31/03/2021	2.5 - 8.5	10.14	4.354	8.84	23.84	19.486	Good	1.3	1747	7.09	73.8	28.1	Low	Light Brown	No odour	No sheen	HydraSleeve.
Stockpile Designated Area 2																			
MW141	28/10/2020	31/03/2021	Not available in ESdat	8.815	2.178	7.515	28.19	26.012	Good	0.39	1568	6.68	64.1	28.5	Clear	Clear	No odour	No sheen	HydraSleeve.

Table T1: Groundwater Gauging and Water Quality Parameter Results

Location Code	HydraSleeve Installation Date	Sample Date	Well Screen Depths (mbtoc)	Well Depth (mbtoc)	Depth to Water (mbtoc)	HydraSleeve Installation Depth (mbTOC)*	TOC Elevation (mAHD)	Groundwater Elevation (mAHD)	Condition of Well	DO (mg/L)	EC (µS/cm)	pH	Eh/Redox (mV)	Temp (°C)	Turbidity	Water Colour	Odour	Sheen	Sample Method/Comments
Suspected AFFF Disposal Area																			
MW101	29/10/2020	31/03/2021	5 - 9	6.87	3.003	5.57	21.23	18.227	Good	0.09	1245	6.51	-9.7	28.9	Turbid	Brown	No odour	No sheen	HydraSleeve.
Top, Middle and Lower Dams																			
MW138	29/10/2020	31/03/2021	6 - 9	9.07	3.121	7.77	16.49	13.369	Good	0.24	3527	6.95	-4.7	28.7	Clear	Clear	Rotten egg smell (sulfurous)	No sheen	HydraSleeve.
Base Boundary																			
MW002	26/03/2021	31/03/2021	Not available in ESdat	5.21	2.155	3.91	11.35	9.195	Good	0.32	857	6.93	46.9	28.6	Low	Light Brown	No odour	No sheen	HydraSleeve.
MW003	26/03/2021	31/03/2021	Not available in ESdat	30.83	3.143	29.53	13.95	10.807	Damaged	1.4	5985	7.1	-134.8	28.4	Low	Light Grey	Rotten egg smell (sulfurous)	No sheen	HydraSleeve without collar. Well casing bent at ground level.
MW117D	28/10/2020	30/03/2021	15 - 20	19.75	1.044	18.45	5.95	4.906	Good	1.72	8695	6.68	-83.1	30.4	Medium	Black / Grey	Rotten egg smell (sulfurous)	No sheen	HydraSleeve.
MW117S	28/10/2020	30/03/2021	2.9 - 5.9	5.85	0.941	4.55	5.96	5.019	Good	3.33	7942	7.48	19.6	29.3	Low	Clear	No odour	No sheen	HydraSleeve.
MW118	28/10/2020	30/03/2021	3 - 6	6.02	1.334	4.72	10.54	9.206	Good	2.17	3952	7.31	85	29.6	Medium	Light Yellow	No odour	No sheen	HydraSleeve.
MW119	28/10/2020	30/03/2021	5.4 - 10.4	10.41	3.273	9.11	18.78	15.507	Good	1.95	7823	6.74	96.8	29.2	Low	Light Yellow	No odour	No sheen	HydraSleeve.
MW124	2/11/2020	31/03/2021	3 - 6	7.89	3.016	6.59	14.41	11.394	Good	5.62	26214	6.92	23.3	28.1	Low	Black / Grey	No odour	No sheen	HydraSleeve.
MW125I	2/11/2020	31/03/2021	5.8 - 8.8	21.92	4.839	20.62	16.67	11.831	Good	7.26	3906	7.33	17.4	27.3	Low	Black / Grey	No odour	No sheen	HydraSleeve.
MW125S	2/11/2020	31/03/2021	1 - 5	7.71	4.845	6.41	16.68	11.835	Good	6.95	4298	6.96	185.3	27.8	Low	Black / Grey	No odour	No sheen	HydraSleeve. Casing and monument in good condition, concrete plinth cracked at base.
Off-Base																			
MW205S	26/03/2021	31/03/2021	8 - 11	8.8	5.168	7.5	6.4	1.232	Good	1.73	27488	6.51	47	27.6	Medium	Grey / Brown	No odour	No sheen	HydraSleeve.
MW212	3/11/2020	31/03/2021	6 - 9	8.86	1.619	7.56	8.31	6.691	Damaged	2.16	20597	6.93	-34	27.8	Medium	Yellow / Brown	Rotten egg smell (sulfurous)	No sheen	HydraSleeve. 1 of 2 bolts unable to be secured. Some suspended material.
MW217	3/11/2020	31/03/2021	3 - 6	5.45	0.831	4.15	7.35	6.519	Good	2.23	11001	6.08	-11.9	26.5	Medium	Black / Grey	No odour	No sheen	HydraSleeve.
MW220S	2/11/2020	1/04/2021	2 - 5	6.02	1.624	4.72	3.75	2.126	Good	2.52	35655	6.61	26.8	26.2	Medium	Black	No odour	No sheen	HydraSleeve.
MW226	29/03/2021	30/03/2021	Not available in ESdat	5.85	0.689	4.55	Not available in ESdat	N/A	Good	2.67	11043	6.41	-40.9	26.3	Low	Light Grey	No odour	No sheen	HydraSleeve. J cap/end cap missing. Well protected by plastic dog kennel and fence.
MW232	26/03/2021	31/03/2021	1 - 4	3.03	0.491	1.73	2.31	1.819	Good	1.49	42007	6.47	-74.2	28.9	Low	Black / Grey	Rotten egg smell (sulfurous)	No sheen	HydraSleeve.
MW233	3/11/2020	31/03/2021	4.2 - 7.2	7.56	0.821	6.26	6.87	6.049	Good	3.25	5619	6.74	17.6	28.1	Low	Black / Grey	No odour	No sheen	HydraSleeve.
MW235S	26/03/2021	31/03/2021	4.1 - 8.1	7.94	5.564	6.64	7.08	1.516	Good	1.76	1874	6.64	-70.1	27.8	Medium	Black / Grey	No odour	No sheen	HydraSleeve. Tree roots in sample.
MW236S	3/11/2020	31/03/2021	4 - 7	6.92	4.503	5.62	6.53	2.027	Good	4.9	520	6.32	66.1	28.5	Medium	Brown	No odour	No sheen	HydraSleeve.

mbtoc - metres below top of casing
 TOC - top of casing
 mAHD - metres above Australian Height Datum
 DO - Dissolved Oxygen
 EC - Electrical Conductivity
 Eh - Redox Oxidation Potential
 Temp - Temperature
 mg/L - milligrams per litre
 µS/cm - microsiemens per centimeter

NTU - Nephelometric Turbidity Unit
 °C - degrees Celcius
 "-" denotes no analysis taken
 mV - millivolt

* Depth at which collar of the HydraSleeve was installed.

Table T2: Groundwater PFAS Analytical Results

Summary table with columns for various PFAS compounds (e.g., PFTS, FOSA, MeFOSA, PFBS, PFPeS, PFHxS, PFHpS, PFOS, PFDS, PFBA, PFHxA, PFPeA, PFHpA, PFOA, PFDA, PFDoDA, PFNA, PFTeDA, PFTDA, PFUnDA) and summary rows for LOR and NEMP guidelines.

Main data table with columns: Field ID, Location Code, Sample Date, and 28 PFAS compound concentrations (e.g., PFTS, FOSA, MeFOSA, PFBS, PFPeS, PFHxS, PFHpS, PFOS, PFDS, PFBA, PFHxA, PFPeA, PFHpA, PFOA, PFDA, PFDoDA, PFNA, PFTeDA, PFTDA, PFUnDA, Sum of PFOS and PFHxS, Sum of PFAS).

LOR is limit of reporting
µg/L is micrograms per litre
< denotes concentration is less than
Hheads of Environmental Protection Agencies (HEPA). (2020). PFAS National Environmental Management Plan (NEMP).
Denotes first time detection above LOR
Denotes new exceedance of guideline values

Table T3: Surface Water Quality Parameter Results

Location Code	Sample Date	DO mg/L	EC µS/cm	pH	Redox (mV)	Temp (°C)	Turbidity	Water Colour	Odour	Sheen	Sample Location Morphology	Comments
Eastern PFAS Contamination Area												
SW119	29/03/2021	9.79	1422	8.77	109.5	30.3	Low	Pale yellow	Slight Organic Odour	No sheen	Concrete drain. Water flowing slowly.	
SW121	29/03/2021	3.49	1621	7.07	13.5	27.5	Medium	Pale yellow	Organic Odour	No sheen	Concrete drain. Water flowing slowly.	
Former Fire Station												
SW109	29/03/2021	3.21	1284	7.01	134.5	28.6	Medium	Light Olive Brown	Organic Odour	No sheen	Open earthen drain. Not flowing.	
SW110	29/03/2021	4.71	968	6.82	42.8	29.5	Medium	Pale yellow	Slight Organic Odour	Slight sheen	Open earthen drain. Not flowing.	
Lavarack Golf Course & Sporting Field												
SW129	26/03/2021	11.21	800	9.92	28.7	35.2	Medium	Pale yellow	Organic Odour	No sheen	Rock drain. Water not flowing.	
SW130	26/03/2021	6.9	1135	9.69	16.8	33.8	Medium	Pale yellow	Organic Odour	No sheen	Rock drain. Water not flowing.	
Top, Middle and Lower Dams												
SW139	29/03/2021	4.85	443.4	7.26	108.5	30.1	Low	Pale yellow	Slight Organic Odour	No sheen	Dam. Water not flowing.	
SW139	22/06/2021	5.8	449.3	6.79	287.4	22.9	Low	Pale yellow	Slight Organic Odour	No sheen	Dam. Water not flowing.	
SW140	29/03/2021	5.47	351.7	7.23	120.2	30.4	Medium	Pale yellow	Slight Organic Odour	No sheen	Dam. Water not flowing.	
SW144	13/05/2021	5.67	253.4	7.24	140.8	23.8	Low	Clear	No odour	No sheen	Dam. Water not flowing. Water depth 0.5 m at sample location	
Remaining On-Base												
SW113	29/03/2021	7.31	324.2	7.28	128.2	28.8	Clear	Other	No odour	No sheen	Creek. Water flowing.	
SW120	29/03/2021	9.22	443.2	8.37	90.4	31.1	Low	Pale yellow	No odour	No sheen	Ephemeral creek. Water flowing slowly.	
Base Boundary												
SW126	26/03/2021	8.28	138.4	8.11	72.3	30.1	Medium	Pale yellow	No odour	No sheen	Rock drain. Water not flowing.	
SW128	26/03/2021	3.81	347.8	8.04	60.4	31.4	Medium	Pale yellow	Organic Odour	No sheen	Rock drain. Water not flowing.	
SW132	1/04/2021	3.27	677	7.03	96.4	25.6	Medium	Yellow	No odour	No sheen	Rock drain. Water flowing.	
SW134	1/04/2021	5.92	300.9	7.94	67.4	25.7	Low	Pale yellow	No odour	No sheen	Earthen drain. Water not flowing.	
SW135	29/03/2021	11.68	817	7.19	89.2	29.1	Medium	Pale yellow	No odour	No sheen	Concrete drain. Water flowing slowly.	
SW135	22/06/2021	11.81	512	7.12	380.5	23.1	Low	Pale yellow	No odour	No sheen	Concrete drain. Water not flowing.	
SW136	26/03/2021	10.98	803	9.17	69.5	36	Low	Pale yellow	Organic Odour	No sheen	Concrete drain. Water not flowing.	
Off-Base												
SW203	29/03/2021	3.83	3772	7.07	103.4	26.8	Medium	Pale yellow	Slight Organic Odour	No sheen	Creek. Water not flowing.	
SW205	29/03/2021	5.25	29196	7.2	141.4	28.3	Medium	Pale yellow	Slight Organic Odour	No sheen	High tide. Tidal creek.	
SW211	1/04/2021	5.67	7077	7.35	95.3	25.5	Medium	Pale yellow	No odour	No sheen	Rock drain. Water not flowing.	
SW212	1/04/2021	4.62	8350	7.54	90.5	24.3	Medium	Pale yellow	No odour	No sheen	Concrete drain. Water not flowing.	
SW217	29/03/2021	3.49	976	7.07	122.1	26.8	Medium	Pale yellow	Slight Organic Odour	No sheen	Creek. Water not flowing.	
SW220	1/04/2021	3.63	2148	7.26	4.19	23.7	Clear	Other	No odour	No sheen	Earthen drain. Water not flowing.	
SW227	26/03/2021	6.59	275.4	-	112.4	31.7	Low	Light Olive Brown	No odour	No sheen	Ross River. Immediately downstream of weir. Water not flowing	
SW232	29/03/2021	2.72	16436	6.87	187.2	27.4	Medium	Dark Olive Brown	Seawater Odour	No sheen	Creek. Water not flowing.	
SW233	29/03/2021	2.83	957	7.43	89	27.2	Medium	Pale yellow	Slight Organic Odour	No sheen	Creek. Water not flowing.	
SW242	29/03/2021	5.34	19470	7.65	145.8	28.7	Medium	Light Olive Brown	Slight Organic Odour	No sheen	Lake. Water not flowing.	
SW243	29/03/2021	6.25	38099	7.51	152.4	28.9	Medium	Pale yellow	No odour	No sheen	Lake. Water not flowing.	
SW244	26/03/2021	5.73	211.4	7.2	121.9	30.1	Low	Light Olive Brown	No odour	No sheen	Ross River. Downstream of Nathan St bridge. Water not flowing.	
SW245	26/03/2021	5.6	173.4	7.06	152.5	29.1	Low	Light Olive Brown	No odour	No sheen	Ross River. Immediately upstream of weir. Water not flowing	

DO - Dissolved Oxygen
 EC - Electrical Conductivity
 Redox - Redox Oxidation Potential
 Temp - Temperature
 NTU - Nephelometric Turbidity Unit
 mg/L - milligrams per litre
 µS/cm - microsiemens per centimetre
 mV - millivolt
 °C - degrees Celcius
 "-" denotes no analysis taken

Table T5: Sediment Observation Results

Location ID	Date	Sample Description	Odour	Comment
Eastern PFAS Contamination Area				
SD119	29/03/2021	Silty SAND. Fine sands, dark brown, soft, saturated.	No odour	Concrete drain. Water flowing slowly.
SD121	29/03/2021	Silty CLAY. Low plasticity, soft, grey and brown, moist, with organic materials.	Organic odour	Concrete drain. Water flowing slowly.
Former Fire Station				
SD109	29/03/2021	Sandy gravelly CLAY. Low plasticity, soft, angular sands and gravels, wet, with some organic materials.	No odour	Open drain. Not flowing.
SD110	29/03/2021	Sandy CLAY. Low plasticity, firm, grey with orange mottling, moist.	No odour	Open drain. Not flowing.
Lavarack Golf Course & Sporting Field				
SD129	26/03/2021	Silty, sandy GRAVEL. Medium to coarse sand and gravels, balck, with organic material.	Organic odour	Rock drain. Water not flowing.
SD130	26/03/2021	Silty, gravelley SAND. Black sand, orange/brown gravels, saturated, with organic material.	Organic odour	Rock drain. Water not flowing.
Top, Middle and Lower Dams				
SD139	29/03/2021	Sandy SILT. Black, saturated, with fine sands and organic material.	Organic odour	Dam. Water not flowing.
SD140	29/03/2021	Clayey SILT. Soft, dark grey, with some fine sands and organic material.	Organic odour	Dam. Water not flowing.
SD144	13/05/2021	Silty SAND. Fine to coarse sand with medium sub-angular gravels, black, saturated, with organic material.	Organic odour	Dam. Water not flowing.
Remaining On-Base				
SD113	29/03/2021	Gravelly SAND. Loose, brown/orange, saturated, with traces of silt.	No odour	Creek. Water flowing.
SD120	29/03/2021	Gravelly SAND. Brown, loose,saturated, with traces of silt.	No odour	Ephemeral creek. Water flowing slowly.
Base Boundary				
SD126	26/03/2021	Sandy CLAY. Medium plasticity, grey, with organic material.	No odour	Rock drain. Water not flowing.
SD128	26/03/2021	Silty CLAY. Medium plasticity, firm, grey, with some sand and gravels, with some organic material.	No odour	Rock drain. Water not flowing.
SD132	1/04/2021	Sanyd CLAY. Fine sands, grey with brown/orange mottling, saturated, with some angular gravels.	No odour	Rock drain. Water flowing.
SD133	29/03/2021	Sandy gravelly CLAY. Low plasticity, firm, fine sands, medium to coarse gravels, grey/brown, moist, with organic materials and some biota (ants and worms)	No odour	Concrete drain. Water not flowing.
SD134	1/04/2021	Sandy SILT. Fine to medium grain sands, dark grey/brown, saturated, with organic materials.	Organic odour	Earthen drain. Water not flowing.
SD135	29/03/2021	Silty SAND. Loose, medium grain, brown, saturated, with organic materials.	Organic odour	Concrete drain. Water flowing slowly.
SD136	26/03/2021	Sandy SILT. Soft, dark grey/brown, moist, with organic material.	Organic odour	Concrete drain. Water not flowing.
Off-Base				
SD203	29/03/2021	Silty SAND. Fine sands, dark brown, firm, saturated, with organic materials	No odour	Creek. Water not flowing.
SD205	29/03/2021	Sandy SILT. Fine to medium sands, loose, saturated, with organic materials.	No odour	High tide. Tidal creek.
SD211	1/04/2021	Silty SAND. Loose to firm, medium sands, dark grey, saturated, with organic materials.	No odour	Rock drain. Water not flowing.
SD212	1/04/2021	Silty SAND. Loose, fine to medium sands, grey/brown, saturated, with organic materials.	No odour	Concrete drain. Water not flowing.
SD217	29/03/2021	Sandy SILT. Fine sands, dark grey, firm, saturated, with organic materials	Organic odour	Creek. Water not flowing.
SD220	1/04/2021	Silty sandy CLAY. Low plasticity, very fine sands, grey/brown with orange mottling, wet, with organic materials.	Organic odour	Earthen drain. Water not flowing.
SD227	26/03/2021	Silty SAND. Fine, loose, dark grey with black organic inclusions, saturated, with organic material.	No odour	Ross River. Immediately downstream of weir. Water not flowing
SD232	29/03/2021	SILT. Soft, black, saturated, with organic material.	Organic odour	Creek. Water not flowing.
SD233	29/03/2021	Sandy SILT. Fine sands, dark brown, firm, saturated, with organic materials	No odour	Creek. Water not flowing.
SD242	29/03/2021	Silty CLAY. Soft, saturated, dark grey, with angular gravels and fine to coarse sand, with organics.	Organic odour	Lake. Water not flowing.
SD243	29/03/2021	Silty CLAY. Dark grey, saturated, with fine sands and inclusions of high plasticity clay.	Organic odour	Lake. Water not flowing.
SD244	26/03/2021	Gravelly SAND. Coarse sand, loose, coarse angular gravels, orange brown, saturated, with organic material.	No odour	Ross River. Downstream of Nathan St bridge. Water not flowing.
SD245	26/03/2021	Silty SAND. Fine, loose, dark grey, saturated, with organic material.	No odour	Ross River. Immediately upstream of weir. Water not flowing

Table T9: Historical Sediment Results

Table with columns for Location ID, Sample Date, and 28 chemical parameters (4:2 FTS, 6:2 FTS, 8:2 FTS, 10:2 FTS, EFOSA, EFOSAA, EFOSE, FOSA, MeFOSA, MFOSAA, MeFOSE, PFBS, PPFoS, PFHxS, PFHpS, PFOS, PFDS, PFBA, PFHxA, PFPeA, PFHpA, PFOA, PFDA, PFDoDA, PFNA, PFTrDA, PFUnDA, Sum of PFHxS and PFOS, Sum of PFAS). Rows include Eastern PFAS Contamination Area, Former Fire Station, Lavarack Golf Course and Sporting Fields, Top, Middle and Lower Dams, Remaining On-Base, Base Boundary, and Off-Base.

Appendix C

Analytical Data Validation

DATA VALIDATION REPORT

Project No.: 60612487	Validation by: RR	Date: 02/07/2021
Client: Department of Defence		
Site: Lavarack Barracks Townsville (0229)		
Matrix type: Groundwater, surface water, sediment	Data verified by: [REDACTED]	Date: 01/06/2021
No. of primary samples: 40 groundwater, 30 surface water, 31 sediment Follow Up Sampling: 2 surface water		
Laboratory: ALS (Brisbane), NMI (Sydney)	Project Manager: [REDACTED]	
Lab reference: ET2101548, ET2101561, ET2101593, ET2101594, ET2101595, RN1310407 Follow Up Sampling: ET2102888, RN1320071		

Key Issues:	No QA/QC issues were identified in the field or laboratory datasets that could have a material implication on data interpretation and therefore decision-making on the project. The data are considered appropriate for use to meet the project objectives.
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Field QA/QC

Sampling personnel	Sampling was conducted by AECOM personnel between 26 March and 1 April 2021 and also on 13 May 2021. Follow up sampling was conducted on 22 June 2021.
Sampling Methodology	Samples were collected using appropriate methods as identified within the main body of the report. Hydrasleeves were installed in the well for a minimum of 24 hours prior to collection.
Chain of Custody (COC)	COC documents completed as per AECOM procedures.
Rinsate Blank	<p>Rinsate blank samples were collected at a frequency of one per field staff per day of sampling (eight in total). Rinsate blanks were collected from the decontaminated interface probe (0229_QC302_210330, 0229_QC303_210331 and 0229_QC304_210331) and surface water sampling cup (0229_QC300_210326, 0229_QC301_210329, 0229_QC305_210401, 0229_QC306_210513 and 0229_QC300_210622).</p> <p>PFHxS and PFOS were detected in 0229_QC301_210329. This rinsate sample was taken off the surface water sampling stainless-steel scoop following sampling of SW135. Sample SW135 was the last sample collected at the end of the fieldwork day and concentrations in the surface water sample were higher than previously reported. Given there is a detection in this rinsate sample, there is some risk of cross-contamination for surface water samples collected on this day (29/03/2021). Field decontamination protocols will be reviewed prior to the next sampling event.</p> <p>All concentrations in the rinsate sample collected during follow up sampling on 22/06/2021 were reported below the LOR for all analytes tested (see Table C4).</p> <p>Concentrations were reported below the LOR for all analytes tested in all other rinsate blanks (see Table C4).</p>
Trip Blanks	Trip blank samples were submitted to the laboratory at a rate of one per batch of samples (four in total). Concentrations were reported below the LOR for all analytes tested in all trip blanks (Table C4).
Field Blank	One field blank sample was collected during follow up sampling on 22/06/2021 to verify sample collection procedures and lab provided rinsate water and sample bottles. Concentrations were reported below the LOR for all analytes tested in the field blank (see Table C4).

Eskies to Laboratory	A total of five eskies of samples in three deliveries were submitted to ALS across the sampling event.
Frequency of field QC	Field duplicates (inter-laboratory duplicates) and triplicates (inter-laboratory duplicates) were collected at a target frequency of one in ten primary samples (five duplicates and triplicates for groundwater, three duplicates and triplicates for surface water and three duplicates and triplicates for sediment). The target frequency of 10% for field duplicates and triplicates was achieved for groundwater and surface water. The 10% target frequency for duplicate and triplicates was not reached for sediment with only three out of a required four pairs collected and analysed. All sediment RPDs for duplicate and triplicate samples analysed were within control limits.
Handling and preservation	<p>Primary, duplicate and triplicate samples were received preserved and chilled at the laboratory. Sample receipt temperature was reported at 14.5 °C, 14.5 °C, 14.5 °C, 10.5 °C, 8.0 °C, 6.3 °C and 5.7 °C.</p> <p>All samples were received at the laboratory in appropriate sample containers with no sample container / preservation non-compliances noted.</p>
Equipment Calibration	Calibration of the water quality meter was conducted each day before sampling, see Appendix F .
Laboratory QA/QC	
Tests requested/reported	Samples were analysed and reported as requested on the COC.
Holding time compliance	Samples were extracted and analysed within recommended holding times.
Laboratory Accreditation	The laboratory analysis was conducted by ALS Environmental Pty Ltd (Brisbane) a National Association of Testing Authorities (NATA) accredited laboratory. The triplicate samples were analysed at the National Measurement Institute (Sydney), also a NATA accredited laboratory.
Frequency of laboratory QC	<p>The laboratory reported sufficient frequency of quality control samples to assess whether the results have been reported to an acceptable accuracy and precision, except:</p> <ul style="list-style-type: none"> Matrix spikes for PFAS in water (0.0%) were below the expected rate of 5% in ET2101594.
Method Blank	No method blank value outliers were reported.
Laboratory duplicate RPDs	Laboratory duplicate Relative Percentage Differences (RPD) were within control limits for all samples.
Laboratory control spike (LCS) recovery	All LCS recoveries were reported within acceptable limits.
Matrix spike recovery	<p>All matrix spike (MS) recoveries were within control limits, except:</p> <ul style="list-style-type: none"> Perfluorobutane sulfonic acid (PFBS), perfluoropentane sulfonic acid (PFPeS), perfluorohexane sulfonic acid (PFHxS), perfluorooctane sulfonic acid (PFOS), Perfluoropentanoic acid (PFPeA) and perfluorohexanoic acid (PFHxA) in sample EC2108502-004, batch ET2101548, was not determined due to background level being greater than or equal to four times the spike level. Recovery of perfluorodecane sulfonic acid (PFDS) and 10:2 fluorotelmer sulfonic acid (10:2 FTS) in sample 0229_SD203_210329, batch ET2101561, was less than the lower data quality objective. PFHxS and PFOS in sample 0229_QC100_210622, batch ET2102888, was not determined due to background level being greater than or equal to four times the spike level.
Surrogate spike recovery	Surrogate spike recoveries were greater than the upper data quality objective in ET2101593 for PFOS and PFOA.

QA/QC Data Evaluation

Comparison of Field Observations and Laboratory Results	No anomalous results between field observations and analysis results were noted.
Data transcription	A random 10% check of the laboratory results identified no anomalies within the electronic data, the laboratory reports, and tables generated by AECOM.
Limits of reporting	<p>Limits of Reporting (LORs) were sufficiently low to enable assessment against adopted screening levels.</p> <p>LOR values were adjusted due to sample matrix interference or high analyte concentrations for the following samples:</p> <ul style="list-style-type: none">• 0229_SD130_210326 and 0229_SD128_210326 in ET2101548.• 0229_QC105_210329, 0229_SD140_210329 and 0229_SW109_210329 in ET2101561.• 0229_SD211_210401 in ET2101595.• 0229_MW212_210331, 0229_MW115_210331, 0229_SD220_210401, 0229_SD134_210401, 0229_MW117S_210330, 0229_MW217_210331, 0229_MW124_210331, 0229_MW072_210331, 0229_MW128_210331, 0229_MW105_210331, 0229_MW074_210331 and 0229_QC108_210331 in ET2101593.• 0229_SD144_210513 in ET2102333.
Field duplicate RPDs	RPDs for groundwater, surface water, and sediment are reported in Tables C1, C2, and C3 respectively. Field duplicate RPDs were reported within control limits.
Field triplicate RPDs	<p>Field triplicate RPDs were reported within control limits for all sample sets with the exception of the following (the sample with the higher concentration is in bold):</p> <ul style="list-style-type: none">• PFBS, PFPeS, PFHxS, PFHpS, PFOS, PFDS, PFBA, PFHxA, PFPeA, PFHpA and PFOA in 0229_MW072_210331 and 0229_QC208_210331, and 0229_MW018_210331 and 0229_QC209_210331. <p>RPDs for the corresponding duplicates (0229_QC108_210331 and 0229_QC109_210331) were within acceptable ranges. All triplicate concentrations, with the exception of PFOS in 0229_QC208_210331, and PFOS and PFHxS in 0229_QC209_210331, were within the same order of magnitude compared to the concentrations in the primary sample.</p>

Table C1: Groundwater Duplicate and Triplicate Results

Lab Report Number	ET2101593	ET2101593	RPD	RN1310407	RPD	ET2101593	ET2101593	RPD	RN1310407	RPD
Field ID	0229_MW125I_210331	0229_QC106_210331		0229_QC206_210331		0229_MW123I_210331	0229_QC107_210331		0229_QC207_210331	
Date	31/03/2021	31/03/2021		31/03/2021		31/03/2021	31/03/2021		31/03/2021	
Sample Type	Primary	Duplicate		Triplicate		Primary	Duplicate		Triplicate	

Chemical Name	Unit	EQL										
4:2 FTS	µg/L	0.01	<0.05	<0.05	NC	<0.01	NC	<0.05	<0.05	NC	<0.01	NC
6:2 FTS	µg/L	0.01	<0.05	<0.05	NC	<0.01	NC	<0.05	<0.05	NC	<0.01	NC
8:2 FTS	µg/L	0.01	<0.05	<0.05	NC	<0.01	NC	<0.05	<0.05	NC	<0.01	NC
10:2 FTS	µg/L	0.01	<0.05	<0.05	NC	<0.01	NC	<0.05	<0.05	NC	<0.01	NC
EtFOSA	µg/L	0.02	<0.05	<0.05	NC	<0.02	NC	<0.05	<0.05	NC	<0.02	NC
EtFOSAA	µg/L	0.01	<0.02	<0.02	NC	<0.01	NC	<0.02	<0.02	NC	<0.01	NC
EtFOSE	µg/L	0.05	<0.05	<0.05	NC	<0.05	NC	<0.05	<0.05	NC	<0.05	NC
FOSA	µg/L	0.01	<0.02	<0.02	NC	<0.01	NC	<0.02	<0.02	NC	<0.01	NC
MeFOSA	µg/L	0.02	<0.05	<0.05	NC	<0.02	NC	<0.05	<0.05	NC	<0.02	NC
MeFOSAA	µg/L	0.01	<0.02	<0.02	NC	<0.01	NC	<0.02	<0.02	NC	<0.01	NC
MeFOSE	µg/L	0.05	<0.05	<0.05	NC	<0.05	NC	<0.05	<0.05	NC	<0.05	NC
PFBS	µg/L	0.01	0.03	0.04	29	0.035	15	0.17	0.16	6	0.13	27
PFPeS	µg/L	0.01	0.02	0.03	40	0.022	10	0.12	0.11	9	0.097	21
PFHxS	µg/L	0.01	0.18	0.18	0	0.17	6	0.37	0.34	8	0.34	8
PFHpS	µg/L	0.01	<0.02	<0.02	NC	<0.01	NC	<0.02	<0.02	NC	<0.01	NC
PFOS	µg/L	0.01	0.05	0.05	0	0.034	38	<0.01	<0.01	NC	<0.02	NC
PFDS	µg/L	0.01	<0.02	<0.02	NC	<0.01	NC	<0.02	<0.02	NC	<0.01	NC
PFBA	µg/L	0.05	<0.1	<0.1	NC	<0.05	NC	<0.1	<0.1	NC	<0.05	NC
PFHxA	µg/L	0.01	0.04	0.04	0	0.03	29	0.07	0.07	0	0.047	39
PFPeA	µg/L	0.02	<0.02	<0.02	NC	<0.02	NC	<0.02	<0.02	NC	<0.02	NC
PFHpA	µg/L	0.01	<0.02	<0.02	NC	<0.01	NC	<0.02	<0.02	NC	<0.01	NC
PFOA	µg/L	0.01	<0.01	<0.01	NC	<0.01	NC	<0.01	<0.01	NC	<0.01	NC
PFDA	µg/L	0.01	<0.02	<0.02	NC	<0.01	NC	<0.02	<0.02	NC	<0.01	NC
PFDoDA	µg/L	0.01	<0.02	<0.02	NC	<0.01	NC	<0.02	<0.02	NC	<0.01	NC
PFNA	µg/L	0.01	<0.02	<0.02	NC	<0.01	NC	<0.02	<0.02	NC	<0.01	NC
PFTeDA	µg/L	0.02	<0.05	<0.05	NC	<0.02	NC	<0.05	<0.05	NC	<0.02	NC
PFTTrDA	µg/L	0.02	<0.02	<0.02	NC	<0.02	NC	<0.02	<0.02	NC	<0.02	NC
PFUnDA	µg/L	0.01	<0.02	<0.02	NC	<0.01	NC	<0.02	<0.02	NC	<0.01	NC

*RPDs have only been considered where a concentration is greater than 1 times the EQL.

**Elevated RPDs are highlighted as per QAQC Profile settings (Acceptable RPDs for each EQL multiplier range are: 100 (1 - 10 x EQL); 50 (10 - 20 x EQL); 30 (> 20 x EQ

***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

Lab Report Number	ET2101593	ET2101593	RPD	RN1310407	RPD	ET2101593	ET2101593	RPD	RN1310407	RPD
Field ID	0229_MW072_210331	0229_QC108_210331		0229_QC208_210331		0229_MW018_210331	0229_QC109_210331		0229_QC209_210331	
Date	31/03/2021	31/03/2021		31/03/2021		31/03/2021	31/03/2021		31/03/2021	
Sample Type	Primary	Duplicate		Triplicate		Primary	Duplicate		Triplicate	

Chemical Name	Unit	EQL										
4:2 FTS	µg/L	0.01	<0.42	<0.37	NC	<0.01	NC	<0.05	<0.05	NC	<0.01	NC
6:2 FTS	µg/L	0.01	<0.42	<0.37	NC	0.16	NC	<0.05	<0.05	NC	<0.01	NC
8:2 FTS	µg/L	0.01	<0.42	<0.37	NC	<0.01	NC	<0.05	<0.05	NC	<0.01	NC
10:2 FTS	µg/L	0.01	<0.42	<0.37	NC	<0.01	NC	<0.05	<0.05	NC	<0.01	NC
EtFOSA	µg/L	0.02	<1.05	<0.92	NC	<0.02	NC	<0.09	<0.1	NC	<0.02	NC
EtFOSAA	µg/L	0.01	<0.42	<0.37	NC	<0.01	NC	<0.04	<0.04	NC	<0.01	NC
EtFOSE	µg/L	0.05	<1.05	<0.92	NC	<0.05	NC	<0.09	<0.1	NC	<0.05	NC
FOSA	µg/L	0.01	<0.42	<0.37	NC	<0.01	NC	<0.04	<0.04	NC	<0.01	NC
MeFOSA	µg/L	0.02	<1.05	<0.92	NC	<0.02	NC	<0.09	<0.1	NC	<0.02	NC
MeFOSAA	µg/L	0.01	<0.42	<0.37	NC	<0.01	NC	<0.04	<0.04	NC	<0.01	NC
MeFOSE	µg/L	0.05	<1.05	<0.92	NC	<0.05	NC	<0.09	<0.1	NC	<0.05	NC
PFBS	µg/L	0.01	7.35	6.01	20	4.9	40	2.22	2.41	8	0.94	81
PFPeS	µg/L	0.01	8.1	6.3	25	4.4	59	2.19	2.31	5	0.84	89
PFHxS	µg/L	0.01	61.4	50	20	40	42	13.8	14.6	6	5.1	92
PFHpS	µg/L	0.01	6	5.05	17	2.9	70	0.78	0.86	10	0.29	92
PFOS	µg/L	0.01	150	126	17	93	47	22.8	24.9	9	8.8	89
PFDS	µg/L	0.01	<0.42	<0.37	NC	<0.01	NC	<0.04	<0.04	NC	<0.01	NC
PFBA	µg/L	0.05	<2.1	<1.8	NC	0.84	NC	0.4	0.4	0	0.16	86
PFHxA	µg/L	0.01	12.9	11.2	14	7.7	50	4.23	4.47	6	1.4	101
PFPeA	µg/L	0.02	2.27	2.27	0	1.4	47	0.72	0.78	8	0.29	85
PFHpA	µg/L	0.01	1.68	1.39	19	1	51	0.44	0.47	7	0.18	84
PFOA	µg/L	0.01	4.37	3.63	19	2.4	58	0.87	0.93	7	0.37	81
PFDA	µg/L	0.01	<0.42	<0.37	NC	<0.01	NC	<0.04	<0.04	NC	<0.01	NC
PFDoDA	µg/L	0.01	<0.42	<0.37	NC	<0.01	NC	<0.04	<0.04	NC	<0.01	NC
PFNA	µg/L	0.01	4.37	3.74	16	3.4	25	<0.04	<0.04	NC	<0.01	NC
PFTeDA	µg/L	0.02	<1.05	<0.92	NC	<0.02	NC	<0.09	<0.1	NC	<0.02	NC
PFTTrDA	µg/L	0.02	<0.42	<0.37	NC	<0.02	NC	<0.04	<0.04	NC	<0.02	NC
PFUnDA	µg/L	0.01	<0.42	<0.37	NC	<0.01	NC	<0.04	<0.04	NC	<0.01	NC

*RPDs have only been considered where a concentration is greater than 1 times the EQL.

**Elevated RPDs are highlighted as per QAQC Profile settings (Acceptable RPDs for each EQL multiplier range are: 100 (1 - 10 x EQL); 50 (10 - 20 x EQL); 30 (> 20 x EQL).

***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

Table C2: Surface Water Duplicate and Triplicate Results

Lab Report Number	ET2101548	ET2101548	RPD	RN1310407	RPD	ET2101561	ET2101561	RPD	RN1310407	RPD	ET2101561	ET2101561	RPD	RN1310407	RPD	ET2102888	ET2102888	RPD	RN1320071	RPD		
Field ID	0229_SW244_210326	0229_OC101_210326		0229_OC201_210326		0229_SW203_210329	0229_OC104_210329		0229_QC202_210329		0229_SW139_210329	0229_OC104_210329		0229_QC204_210329		0229_SW135_210622	0229_OC100_210622		0229_OC206_220621			
Date	26/03/2021	26/03/2021		26/03/2021		29/03/2021	29/03/2021		29/03/2021		29/03/2021	29/03/2021		29/03/2021		22/06/2021	22/06/2021		22/06/2021			
Sample Type	Primary	Duplicate		Triplicate		Primary	Duplicate		Triplicate		Primary	Duplicate		Triplicate		Primary	Duplicate		Triplicate			
Chemical Name	Unit	EQL																				
4:2 FTS	µg/L	0.01	<0.05	<0.05	NC	<0.01	NC	<0.05	<0.05	NC	<0.01	NC	<0.05	<0.05	NC	<0.01	NC	<0.05	<0.05	NC	<0.01	NC
8:2 FTS	µg/L	0.01	<0.05	<0.05	NC	<0.01	NC	<0.05	<0.05	NC	<0.01	NC	<0.05	<0.05	NC	<0.01	NC	<0.05	<0.05	NC	<0.01	NC
8:2 FTS	µg/L	0.01	<0.05	<0.05	NC	<0.01	NC	<0.05	<0.05	NC	<0.01	NC	<0.05	<0.05	NC	<0.01	NC	<0.05	<0.05	NC	<0.01	NC
10:2 FTS	µg/L	0.01	<0.05	<0.05	NC	<0.01	NC	<0.05	<0.05	NC	<0.01	NC	<0.05	<0.05	NC	<0.01	NC	<0.05	<0.05	NC	<0.01	NC
EFOSA	µg/L	0.02	<0.05	<0.05	NC	<0.02	NC	<0.05	<0.05	NC	<0.02	NC	<0.05	<0.05	NC	<0.02	NC	<0.05	<0.05	NC	<0.02	NC
EFOSAA	µg/L	0.01	<0.02	<0.02	NC	<0.01	NC	<0.02	<0.02	NC	<0.01	NC	<0.02	<0.02	NC	<0.01	NC	<0.02	<0.02	NC	<0.01	NC
EtFOSE	µg/L	0.05	<0.05	<0.05	NC	<0.05	NC	<0.05	<0.05	NC	<0.05	NC	<0.05	<0.05	NC	<0.05	NC	<0.05	<0.05	NC	<0.05	NC
FOSA	µg/L	0.01	<0.02	<0.02	NC	<0.01	NC	<0.02	<0.02	NC	<0.01	NC	<0.02	<0.02	NC	<0.01	NC	<0.02	<0.02	NC	<0.01	NC
MeFOSA	µg/L	0.02	<0.05	<0.05	NC	<0.02	NC	<0.05	<0.05	NC	<0.02	NC	<0.05	<0.05	NC	<0.02	NC	<0.05	<0.05	NC	<0.02	NC
MeFOSAA	µg/L	0.01	<0.02	<0.02	NC	<0.01	NC	<0.02	<0.02	NC	<0.01	NC	<0.02	<0.02	NC	<0.01	NC	<0.02	<0.02	NC	<0.01	NC
MeFOSE	µg/L	0.05	<0.05	<0.05	NC	<0.05	NC	<0.05	<0.05	NC	<0.05	NC	<0.05	<0.05	NC	<0.05	NC	<0.05	<0.05	NC	<0.05	NC
PFBS	µg/L	0.01	<0.02	<0.02	NC	<0.01	NC	0.08	0.08	0	0.063	24	0.14	0.13	7	0.11	24	0.12	NC	0.092	26	
PFPeS	µg/L	0.01	<0.02	<0.02	NC	<0.01	NC	0.04	0.04	0	0.029	32	0.11	0.11	0	0.088	22	0.08	0.08	NC	0.053	41
PFHxS	µg/L	0.01	<0.02	<0.02	NC	<0.01	NC	0.31	0.33	6	0.29	7	0.84	0.84	0	0.81	4	1.02	1	2	0.82	22
PFHpS	µg/L	0.01	<0.02	<0.02	NC	<0.01	NC	<0.02	0.02	0	0.011	0	0.06	0.06	0	0.036	50	0.05	0.04	22	0.028	56
PFOS	µg/L	0.01	<0.01	<0.01	NC	<0.02	NC	0.42	0.46	9	0.32	27	1.56	1.42	9	1.2	26	2.44	2.28	7	1.9	25
PFOS	µg/L	0.01	<0.02	<0.02	NC	<0.01	NC	<0.02	<0.02	NC	<0.01	NC	<0.02	<0.02	NC	<0.01	NC	<0.02	<0.02	NC	<0.01	NC
PFBA	µg/L	0.05	<0.1	<0.1	NC	<0.05	NC	<0.1	<0.1	NC	<0.05	NC	<0.1	<0.1	NC	<0.05	NC	<0.1	<0.1	NC	<0.05	NC
PFHxA	µg/L	0.01	<0.02	<0.02	NC	<0.01	NC	0.06	0.06	0	0.038	45	0.29	0.28	4	0.22	27	0.08	0.08	NC	0.049	48
PFPeA	µg/L	0.02	<0.02	<0.02	NC	<0.02	NC	<0.02	<0.02	NC	<0.02	NC	0.06	0.06	0	0.045	29	<0.02	<0.02	NC	<0.02	NC
PFHpA	µg/L	0.01	<0.02	<0.02	NC	<0.01	NC	<0.02	<0.02	NC	<0.01	NC	0.03	0.03	0	0.024	22	<0.02	<0.02	NC	<0.01	NC
PFDA	µg/L	0.01	<0.01	<0.01	NC	<0.01	NC	0.02	0.02	0	0.015	29	0.07	0.07	0	0.054	26	0.03	0.04	29	0.023	26
PFDA	µg/L	0.01	<0.02	<0.02	NC	<0.01	NC	<0.02	<0.02	NC	<0.01	NC	<0.02	<0.02	NC	<0.01	NC	<0.02	<0.02	NC	<0.01	NC
PFDA	µg/L	0.01	<0.02	<0.02	NC	<0.01	NC	<0.02	<0.02	NC	<0.01	NC	<0.02	<0.02	NC	<0.01	NC	<0.02	<0.02	NC	<0.01	NC
PFNA	µg/L	0.01	<0.02	<0.02	NC	<0.01	NC	<0.02	<0.02	NC	<0.01	NC	<0.02	<0.02	NC	<0.01	NC	0.04	0.03	29	0.025	46
PFTeDA	µg/L	0.02	<0.05	<0.05	NC	<0.02	NC	<0.05	<0.05	NC	<0.02	NC	<0.05	<0.05	NC	<0.02	NC	<0.05	<0.05	NC	<0.02	NC
PFTDA	µg/L	0.02	<0.02	<0.02	NC	<0.02	NC	<0.02	<0.02	NC	<0.02	NC	<0.02	<0.02	NC	<0.02	NC	<0.02	<0.02	NC	<0.02	NC
PFUnDA	µg/L	0.01	<0.02	<0.02	NC	<0.01	NC	<0.02	<0.02	NC	<0.01	NC	<0.02	<0.02	NC	<0.01	NC	<0.02	<0.02	NC	<0.01	NC

*RPDs have only been considered where a concentration is greater than 1 times the EQL.
**Elevated RPDs are highlighted as per QAQC Profile settings (Acceptable RPDs for each EQL multiplier range are: 100 (1 - 10 x EQL); 50 (10 - 20 x EQL); 30 (> 20 x EQL))
***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

Appendix D

Chain of Custody Forms



Custody Document for Submissions via ALS Compass App

Project: OLD-0229-PEASOMP-20 Client: AECOM

Project Manager:

Phone:

ALS Compass COC Reference: 20735 # Samples: 20

Sampler:

Phone:

Turnaround Requirements: Standard Urgent

Special Instructions:

125mL bottles provided, standard LOR required.

Custody:

Relinquished by:



Received by:



Relinquished by:

Received by:

Date / Time:

26/3/21 1645

Date / Time:

26/3/21 1645

Date / Time:

Date / Time:

**CHAIN OF CUSTODY**

COC#: 20735 ALS Laboratory: ET Townsville

RELINQUISHED BY:

RECEIVED BY:

RELINQUISHED BY:

RECEIVED BY:

DATE TIME:

DATE TIME:

DATE TIME:

DATE TIME:

CLIENT: AECOMAU - AECOM Australia Pty Ltd

PROJECT: QLD_0229_PFASOMP_20

SITE: QLD_0229

ORDER NO:

PROJECT MANAGER:

PRIMARY SAMPLER:

EMAIL REPORTS TO:

EMAIL INVOICES TO:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

CONTACT PH:

SAMPLER MOBILE:

QUOTE NO: TV/007/21 - Compass

/ ET2021AECOMAU000

1

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	ANALYSIS REQUIRED			
							Sediments SEDIMENT	Waters WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
001	QLD_0229_SW227_26032 1		26/03/2021 11:11 AM	Water	ALS: 4 Non ALS: 0	No		Partial 1/4		Extra volume for lab QC
002	QLD0229_SW244_210326		26/03/2021 09:00 AM	Water	ALS: 2 Non ALS: 0	No		Partial 1/4		
003	QLD_0229_QC100_21032 6		26/03/2021 11:16 AM	Soil	ALS: 1 Non ALS: 0	No	Partial 1/4			
004	QLD_0229_SD244_210326		26/03/2021 11:19 AM	Soil	ALS: 1 Non ALS: 0	No	Partial 1/4			
005	QLD_0229_SD245_210326		26/03/2021 11:20 AM	Soil	ALS: 1 Non ALS: 0	No	Partial 1/4			
006	QLD_0229_SW245_21032 6		26/03/2021 11:22 AM	Water	ALS: 2 Non ALS: 0	No		Partial 1/4		
007	QLD_0229_SD227_210326		26/03/2021 11:23 AM	Soil	ALS: 1 Non ALS: 0	No	Partial 1/4			
008	QLD_0229_QC101_21032 6		26/03/2021 11:24 AM	Water	ALS: 2 Non ALS: 0	No		Partial 1/4		
009	QLD_0229_QC500_21032 6		26/03/2021 11:26 AM	Water	ALS: 2 Non ALS: 0	No		Partial 1/4		

**CHAIN OF CUSTODY**

ALS COC#: 20735 ALS Laboratory: ET Townsville

RELINQUISHED BY:

RECEIVED BY:

RELINQUISHED BY:

RECEIVED BY:

DATE TIME:

DATE TIME:

DATE TIME:

DATE TIME:

CLIENT: AECOMAU - AECOM Australia Pty Ltd

PROJECT: QLD_0229_PFASOMP_20

SITE: QLD_0229

ORDER NO:

PROJECT MANAGER:

PRIMARY SAMPLER:

EMAIL REPORTS TO:

EMAIL INVOICES TO:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard Info:

CONTACT PH:

QUOTE NO: TV/007/21 - Compass

SAMPLER MOBILE:

/ ET2021AECOMAU000

1

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	ANALYSIS REQUIRED			
							Sediments SEDIMENT	Waters WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
010	QLD_0229_SW136_21032_6		26/03/2021 01:39 PM	Water	ALS: 2 Non ALS: 0	No		Partial 1/4		
011	QLD_0229_SD136_210326		26/03/2021 01:40 PM	Soil	ALS: 1 Non ALS: 0	No	Partial 1/4			
012	QLD_0229_SW130_21032_6		26/03/2021 01:57 PM	Water	ALS: 2 Non ALS: 0	No		Partial 1/4		
013	QLD_0229_SD130_210326		26/03/2021 01:58 PM	Soil	ALS: 1 Non ALS: 0	No	Partial 1/4			
014	QLD_0229_SD129_210326		26/03/2021 02:11 PM	Soil	ALS: 1 Non ALS: 0	No	Partial 1/4			
015	QLD_0229_SW129_21032_6		26/03/2021 02:12 PM	Water	ALS: 4 Non ALS: 0	No		Partial 1/4		Extra lab volume
016	QLD_0229_SD128_210326		26/03/2021 02:23 PM	Soil	ALS: 1 Non ALS: 0	No	Partial 1/4			
017	QLD_0229_SW128_26032_1		26/03/2021 02:24 PM	Water	ALS: 2 Non ALS: 0	No		Partial 1/4		
018	QLD_0229_SW126_21032_6		26/03/2021 02:35 PM	Water	ALS: 2 Non ALS: 0	No		Partial 1/4		

**CHAIN OF CUSTODY**

COC#: 20735 ALS Laboratory: ET Townsville

RELINQUISHED BY:
DATE TIME:RECEIVED BY:
DATE TIME:RELINQUISHED BY:
DATE TIME:RECEIVED BY:
DATE TIME:CLIENT: AECOMAU - AECOM Australia Pty Ltd
PROJECT: QLD_0229_PFSOMP_20
SITE: QLD_0229
ORDER NO: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:
PRIMARY SAMPLER:CONTACT PH: SAMPLER MOBILE:
QUOTE NO: TV/007/21 - Compass / ET2021AECOMAU000
1

EMAIL REPORTS TO:

EMAIL INVOICES TO:

SAMPLE DETAILS							ANALYSIS REQUIRED			
SAMPLE	NAME	DESCRIPTION	DATE / TIME	MATRIX	TOTAL BOTTLES	ON HOLD	Sediments SEDIMENT	Waters WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
019	QLD_0229_SD126_210326		26/03/2021 03:34 PM	Soil	ALS: 1 Non ALS: 0	No	Partial 1/4	.		
020	QLD_0229_QC300_210326		26/03/2021 03:16 PM	Water	ALS: 2 Non ALS: 0	No		Partial 1/4		

**CHAIN OF CUSTODY**

COC#: 20735

ALS Laboratory: ET Townsville

RELINQUISHED BY:

RECEIVED BY:

RELINQUISHED BY:

RECEIVED BY:

DATE TIME:

DATE TIME:

DATE TIME:

DATE TIME:

CLIENT: AECOMAU - AECOM Australia Pty Ltd

PROJECT: QLD_0229_PFASOMP_20

SITE: QLD_0229

ORDER NO:

PROJECT MANAGER:

PRIMARY SAMPLER:

EMAIL REPORTS TO:

EMAIL INVOICES TO:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

CONTACT PH:

QUOTE NO: TV/007/21 - Compass

SAMPLER MOBILE:

/ ET2021AECOMAU000
1**LABORATORY USE ONLY (Circle)**

Custody Seal intact?

Yes No N/A

Free ice / frozen ice bricks present upon receipt?

Yes No N/A

Random Sample Temperature on Receipt:

C

Other comments:

SAMPLE	SAMPLE NAME	PARTIAL ANALYSIS GROUP NAME	MATRIX	SELECTED ANALYSIS NAME
001	QLD_0229_SW227_26032 1	Waters WATER	Water	- EP231X PFAS - Full Suite (28 analytes)
002	QLD0229_SW244_210326	Waters WATER	Water	- EP231X PFAS - Full Suite (28 analytes)
003	QLD_0229_QC100_21032 6	Sediments SEDIMENT	Soil	- EP231X (solids) PFAS - Full Suite (28 analytes)
004	QLD_0229_SD244_21032 6	Sediments SEDIMENT	Soil	- EP231X (solids) PFAS - Full Suite (28 analytes)
005	QLD_0229_SD245_21032 6	Sediments SEDIMENT	Soil	- EP231X (solids) PFAS - Full Suite (28 analytes)
006	QLD_0229_SW245_21032 6	Waters WATER	Water	- EP231X PFAS - Full Suite (28 analytes)
007	QLD_0229_SD227_21032 6	Sediments SEDIMENT	Soil	- EP231X (solids) PFAS - Full Suite (28 analytes)
008	QLD_0229_QC101_21032 6	Waters WATER	Water	- EP231X PFAS - Full Suite (28 analytes)
009	QLD_0229_QC500_21032 6	Waters WATER	Water	- EP231X PFAS - Full Suite (28 analytes)
010	QLD_0229_SW136_21032 6	Waters WATER	Water	- EP231X PFAS - Full Suite (28 analytes)
011	QLD_0229_SD136_21032 6	Sediments SEDIMENT	Soil	- EP231X (solids) PFAS - Full Suite (28 analytes)
012	QLD_0229_SW130_21032 6	Waters WATER	Water	- EP231X PFAS - Full Suite (28 analytes)
013	QLD_0229_SD130_21032 6	Sediments SEDIMENT	Soil	- EP231X (solids) PFAS - Full Suite (28 analytes)
014	QLD_0229_SD129_21032 6	Sediments SEDIMENT	Soil	- EP231X (solids) PFAS - Full Suite (28 analytes)
015	QLD_0229_SW129_21032 6	Waters WATER	Water	- EP231X PFAS - Full Suite (28 analytes)

**CHAIN OF CUSTODY**

COC#: 20735 ALS Laboratory: ET Townsville

RELINQUISHED BY:

RECEIVED BY:

RELINQUISHED BY:

RECEIVED BY:

DATE TIME:

DATE TIME:

DATE TIME:

DATE TIME:

CLIENT: AECOMAU - AECOM Australia Pty Ltd

PROJECT: QLD_0229_PASOMP_20

SITE: QLD_0229

ORDER NO:

PROJECT MANAGER:

PRIMARY SAMPLER:

EMAIL REPORTS TO:

EMAIL INVOICES TO:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

CONTACT PH:

QUOTE NO: TV/007/21 - Compass

SAMPLER MOBILE:

/ ET2021AECOMAU000

1

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 ID	Sample Description	Matrix	Analysis
016	QLD_0229_SD128_21032 6	Sediments SEDIMENT	Soil - EP231X (solids) PFAS - Full Suite (28 analytes)
017	QLD_0229_SW128_28032 1	Waters WATER	Water - EP231X PFAS - Full Suite (28 analytes)
018	QLD_0229_SW126_21032 6	Waters WATER	Water - EP231X PFAS - Full Suite (28 analytes)
019	QLD_0229_SD126_21032 6	Sediments SEDIMENT	Soil - EP231X (solids) PFAS - Full Suite (28 analytes)
020	QLD_0229_QC300_21032 6	Waters WATER	Water - EP231X PFAS - Full Suite (28 analytes)

**CHAIN OF CUSTODY**

CO# #: 20735 ALS Laboratory: ET Townsville

CLIENT: AECOMAU - AECOM Australia Pty Ltd

PROJECT: QLD_0229_PFASOMP_20

SITE: QLD_0229

ORDER NO:

PROJECT MANAGER:

PRIMARY SAMPLER:

EMAIL REPORTS TO:

EMAIL INVOICES TO:

RELINQUISHED BY:

DATE TIME:

RECEIVED BY:

DATE TIME:

RELINQUISHED BY:

DATE TIME:

RECEIVED BY:

DATE TIME:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

CONTACT PH:

QUOTE NO: TV/007/21 - Compass

SAMPLER MOBILE:

/ ET2021AECOMAU000

1

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	QLD_0229_SW227_26032	HDPE (no PTFE)	20 mL	00350719030357	Grey	No	
001	QLD_0229_SW227_26032	HDPE (no PTFE)	20 mL	00350719030116	Grey	No	
001	QLD_0229_SW227_26032	HDPE (no PTFE)	20 mL	00350719030305	Grey	No	
001	QLD_0229_SW227_26032	HDPE (no PTFE)	20 mL	00350719030174	Grey	No	
002	QLD0229_SW244_210326	HDPE (no PTFE)	20 mL	00350719030202	Grey	No	
002	QLD0229_SW244_210326	HDPE (no PTFE)	20 mL	00350719030186	Grey	No	
003	QLD_0229_QC100_21032	HDPE Soil Jar	200 mL	00620719071605	Grey	No	
004	QLD_0229_SD244_21032	HDPE Soil Jar	200 mL	00620719071643	Grey	No	
005	QLD_0229_SD245_21032	HDPE Soil Jar	200 mL	00620719071649	Grey	No	
006	QLD_0229_SW245_21032	HDPE (no PTFE)	20 mL	00351219044717	Grey	No	
006	QLD_0229_SW245_21032	HDPE (no PTFE)	20 mL	00351219044673	Grey	No	
007	QLD_0229_SD227_21032	HDPE Soil Jar	200 mL	00620719071625	Grey	No	
008	QLD_0229_QC101_21032	HDPE (no PTFE)	20 mL	00350719030285	Grey	No	
008	QLD_0229_QC101_21032	HDPE (no PTFE)	20 mL	00350719030254	Grey	No	
009	QLD_0229_QC500_21032	HDPE (no PTFE)	20 mL	00352010034694	Grey	No	
009	QLD_0229_QC500_21032	HDPE (no PTFE)	20 mL	00352010034735	Grey	No	
010	QLD_0229_SW136_21032	HDPE (no PTFE)	20 mL	00350719030258	Grey	No	
010	QLD_0229_SW136_21032	HDPE (no PTFE)	20 mL	00350719030238	Grey	No	
011	QLD_0229_SD136_21032	HDPE Soil Jar	200 mL	00620719071610	Grey	No	
012	QLD_0229_SW130_21032	HDPE (no PTFE)	20 mL	00350719030217	Grey	No	
012	QLD_0229_SW130_21032	HDPE (no PTFE)	20 mL	00350719030212	Grey	No	
013	QLD_0229_SD130_21032	HDPE Soil Jar	200 mL	00620719071630	Grey	No	
014	QLD_0229_SD129_21032	HDPE Soil Jar	200 mL	00620719071678	Grey	No	
015	QLD_0229_SW129_21032	HDPE (no PTFE)	20 mL	00350719030189	Grey	No	
015	QLD_0229_SW129_21032	HDPE (no PTFE)	20 mL	00350719030343	Grey	No	
015	QLD_0229_SW129_21032	HDPE (no PTFE)	20 mL	00350719030321	Grey	No	

**CHAIN OF CUSTODY**

COC#: 20735 ALS Laboratory: ET Townsville

RELINQUISHED BY:

DATE TIME:
RECEIVED BY:

DATE TIME:
RELINQUISHED BY:

DATE TIME:
RECEIVED BY:

DATE TIME:

CLIENT: AECOMAU - AECOM Australia Pty Ltd

PROJECT: QLD_0229_PFASOMP_20

SITE: QLD_0229

ORDER NO:

PROJECT MANAGER:

PRIMARY SAMPLER:

EMAIL REPORTS TO:

EMAIL INVOICES TO:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

CONTACT PH:

QUOTE NO: TV/007/21 - Compass

SAMPLER MOBILE:

/ ET2021AECOMAU000

1

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	QLD_0229_SW129_21032	HDPE (no PTFE)	20 mL	00350719030169	Grey	No	
016	QLD_0229_SD128_21032	HDPE Soil Jar	200 mL	00620719071861	Grey	No	
017	QLD_0229_SW128_26032	HDPE (no PTFE)	20 mL	00350719030376	Grey	No	
017	QLD_0229_SW128_26032	HDPE (no PTFE)	20 mL	00350719030295	Grey	No	
018	QLD_0229_SW126_21032	HDPE (no PTFE)	20 mL	00350719030219	Grey	No	
018	QLD_0229_SW126_21032	HDPE (no PTFE)	20 mL	00350719030220	Grey	No	
019	QLD_0229_SD126_21032	HDPE Soil Jar	200 mL	00620719071615	Grey	No	
020	QLD_0229_QC300_21032	HDPE (no PTFE)	20 mL	00350719030143	Grey	No	
020	QLD_0229_QC300_21032	HDPE (no PTFE)	20 mL	00350719030121	Grey	No	

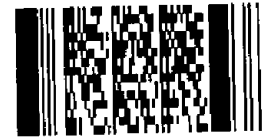
Total Bottle Count: ALS: 35, Non ALS: 0



ALS Compass
SAMPLING *Intelligence*



Environmental Division
Townsville
Work Order Reference
ET2101561



Telephone : +61 7 4773 0000

Custody Document for Submissions via ALS Compass App

Project: 6 Client: AECOM Project Manager: _____
Phone: (_____)

ALS Compass COC Reference: 20185 # Samples: _____
Sampler: _____
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:	Received by:	Relinquished by:	Received by:
Date / Time:	Date / Time:	Date / Time:	Date / Time:
29/3/2021 1644	29/3/2021 1644		

**CHAIN OF CUSTODY**

COC#: 20785 ALS Laboratory: ET Townsville

RELINQUISHED BY:
DATE TIME:RECEIVED BY:
DATE TIME:RELINQUISHED BY:
DATE TIME:RECEIVED BY:
DATE TIME:CLIENT: AECOMAU - AECOM Australia Pty Ltd
PROJECT: QLD_0229_PFSOMP_20
SITE: QLD_0229
ORDER NO: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:
PRIMARY SAMPLER:CONTACT PH: SAMPLER MOBILE:
QUOTE NO: TV/007/21 - Compass / ET2021AECOMAU0001

EMAIL REPORTS TO:

EMAIL INVOICES TO:

SAMPLE DETAILS							ANALYSIS REQUIRED			
SAMPLE	NAME	DESCRIPTION	DATE / TIME	MATRIX	TOTAL BOTTLES	ON HOLD	Sediments SEDIMENT	Waters WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
001	0229_QC501_210329		29/03/2021 10:58 AM	Water	ALS: 2 Non ALS: 0	No		Partial 1/4		
002	0229_SW232_210329		29/03/2021 10:59 AM	Water	ALS: 2 Non ALS: 0	No		Partial 1/4		
003	0229_SW242_210329		29/03/2021 11:00 AM	Water	ALS: 2 Non ALS: 0	No		Partial 1/4		
004	0229_SW205_210329		29/03/2021 11:00 AM	Water	ALS: 2 Non ALS: 0	No		Partial 1/4		
005	0229_SW233_210329		29/03/2021 11:01 AM	Water	ALS: 2 Non ALS: 0	No		Partial 1/4		
006	0229_SW217_210329		29/03/2021 11:02 AM	Water	ALS: 2 Non ALS: 0	No		Partial 1/4		
007	0229_SW243_210329		29/03/2021 11:03 AM	Water	ALS: 2 Non ALS: 0	No		Partial 1/4		
008	0229_SW203_210329		29/03/2021 11:03 AM	Water	ALS: 2 Non ALS: 0	No		Partial 1/4		
009	0229_QC102_210329		29/03/2021 11:04 AM	Water	ALS: 2 Non ALS: 0	No		Partial 1/4		

**CHAIN OF CUSTODY**

COC#: 20785 ALS Laboratory: ET Townsville

CLIENT: AECOMAU - AECOM Australia Pty Ltd

PROJECT: QLD_0229_PFSOMP_20

SITE: QLD_0229

ORDER NO:

PROJECT MANAGER: [REDACTED]
PRIMARY SAMPLER: [REDACTED]

EMAIL REPORTS TO: [REDACTED]

EMAIL INVOICES TO: [REDACTED]

RELINQUISHED BY:

DATE TIME:

RECEIVED BY:

DATE TIME:

RELINQUISHED BY:

DATE TIME:

RECEIVED BY:

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:

CONTACT PH: [REDACTED] SAMPLER MOBILE: [REDACTED]
QUOTE NO: TV/007/21 - Compass / ET2021AECOMAU0001

SAMPLE DETAILS							ANALYSIS REQUIRED			
SAMPLE	NAME	DESCRIPTION	DATE / TIME	MATRIX	TOTAL BOTTLES	ON HOLD	Sediments SEDIMENT	Waters WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
010	0229_SD242_210329		29/03/2021 11:05 AM	Soil	ALS: 1 Non ALS: 0	No	Partial 1/4			
011	0229_SD203_210329		29/03/2021 11:06 AM	Soil	ALS: 1 Non ALS: 0	No	Partial 1/4			
012	0229_SD232_210329		29/03/2021 11:07 AM	Soil	ALS: 1 Non ALS: 0	No	Partial 1/4			
013	0229_SD205_210329		29/03/2021 11:07 AM	Soil	ALS: 1 Non ALS: 0	No	Partial 1/4			
014	0229_SD217_210329		29/03/2021 11:08 AM	Soil	ALS: 1 Non ALS: 0	No	Partial 1/4			
015	0229_SD243_210329		29/03/2021 11:09 AM	Soil	ALS: 1 Non ALS: 0	No	Partial 1/4			
016	0229_SD233_210329		29/03/2021 11:10 AM	Soil	ALS: 1 Non ALS: 0	No	Partial 1/4			
017	0229_QC103_210329		29/03/2021 11:11 AM	Soil	ALS: 1 Non ALS: 0	No	Partial 1/4			
018	0229_SW119_210329		29/03/2021 12:35 PM	Water	ALS: 2 Non ALS: 0	No		Partial 1/4		

**CHAIN OF CUSTODY**

COC#: 20785 ALS Laboratory: ET Townsville

RELINQUISHED BY:

RECEIVED BY:

RELINQUISHED BY:

RECEIVED BY:

DATE TIME:

DATE TIME:

DATE TIME:

DATE TIME:

CLIENT: AECOMAU - AECOM Australia Pty Ltd

PROJECT: QLD_0229_PFASOMP_20

SITE: QLD_0229

ORDER NO:

PROJECT MANAGER: [REDACTED]
PRIMARY SAMPLER: [REDACTED]CONTACT PH: [REDACTED] SAMPLER MOBILE: [REDACTED]
QUOTE NO: TV/007/21 - Compass / ET2021AECOMAU000
1

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

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

Random Sample Temperature on Receipt: °C

Other comments:

EMAIL REPORTS TO: [REDACTED]

EMAIL INVOICES TO: [REDACTED]

SAMPLE DETAILS**ANALYSIS REQUIRED**

SAMPLE	NAME	DESCRIPTION	DATE / TIME	MATRIX	TOTAL BOTTLES	ON HOLD	ANALYSIS REQUIRED			ADDITIONAL INFORMATION
							Sediments SEDIMENT	Waters WATER	ALTERNATIVE ANALYSIS	
019	0229_SD119_210329		29/03/2021 12:36 PM	Soil	ALS: 1 Non ALS: 0	No	Partial 1/4			
020	0229_SD120_210329		29/03/2021 12:42 PM	Soil	ALS: 1 Non ALS: 0	No	Partial 1/4			
021	0229_SW120_210329		29/03/2021 12:42 PM	Water	ALS: 2 Non ALS: 0	No		Partial 1/4		
022	0229_SD137_210329		29/03/2021 12:56 PM	Soil	ALS: 1 Non ALS: 0	No	Partial 1/4			
023	0229_SW137_210329		29/03/2021 12:56 PM	Water	ALS: 2 Non ALS: 0	No		Partial 1/4		
024	0229_SD113_210329		29/03/2021 01:22 PM	Soil	ALS: 1 Non ALS: 0	No	Partial 1/4			
025	0229_SW113_210329		29/03/2021 01:23 PM	Water	ALS: 2 Non ALS: 0	No		Partial 1/4		
026	0229_SD109_210329		29/03/2021 01:47 PM	Soil	ALS: 1 Non ALS: 0	No	Partial 1/4			
027	0229_SW109_210329		29/03/2021 01:48 PM	Water	ALS: 2 Non ALS: 0	No		Partial 1/4		

**CHAIN OF CUSTODY**

ALS COC#: 20785 ALS Laboratory: ET Townsville

RELINQUISHED BY:

RECEIVED BY:

RELINQUISHED BY:

RECEIVED BY:

DATE TIME:

DATE TIME:

DATE TIME:

DATE TIME:

CLIENT: AECOMAU - AECOM Australia Pty Ltd

PROJECT: QLD_0229_PFASOMP_20

SITE: QLD_0229

ORDER NO:

PROJECT MANAGER: [REDACTED]
PRIMARY SAMPLER: [REDACTED]CONTACT PH: [REDACTED] SAMPLER MOBILE: [REDACTED]
QUOTE NO: TV/007/21 - Compass / ET2021AECOMAU000
1

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

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

Random Sample Temperature on Receipt: °C

Other comments:

EMAIL REPORTS TO: [REDACTED]

EMAIL INVOICES TO: [REDACTED]

SAMPLE DETAILS							ANALYSIS REQUIRED			
SAMPLE	NAME	DESCRIPTION	DATE / TIME	MATRIX	TOTAL BOTTLES	ON HOLD	Sediments SEDIMENT	Waters WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
028	0229_SD110_210329		29/03/2021 02:07 PM	Soil	ALS: 1 Non ALS: 0	No	Partial 1/4			
029	0229_SW110_210329		29/03/2021 02:08 PM	Water	ALS: 2 Non ALS: 0	No		Partial 1/4		
030	0229_SW139_210329		29/03/2021 02:26 PM	Water	ALS: 4 Non ALS: 0	No		Partial 1/4		
031	0229_QC104_210329		29/03/2021 02:27 PM	Water	ALS: 2 Non ALS: 0	No		Partial 1/4		
032	0229_SD139_210329		29/03/2021 02:28 PM	Soil	ALS: 1 Non ALS: 0	No	Partial 1/4			
033	0229_QC105_210329		29/03/2021 02:28 PM	Soil	ALS: 1 Non ALS: 0	No	Partial 1/4			
034	0229_SW140_210329		29/03/2021 02:58 PM	Water	ALS: 4 Non ALS: 0	No		Partial 1/4		
035	0229_SD140_210329		29/03/2021 02:58 PM	Soil	ALS: 1 Non ALS: 0	No	Partial 1/4			
036	0229_SW121_210329		29/03/2021 03:17 PM	Water	ALS: 4 Non ALS: 0	No		Partial 1/4		

**CHAIN OF CUSTODY**

COC#: 20785 ALS Laboratory: ET Townsville

RELINQUISHED BY:

RECEIVED BY:

RELINQUISHED BY:

RECEIVED BY:

DATE TIME:

DATE TIME:

DATE TIME:

DATE TIME:

CLIENT: AECOMAU - AECOM Australia Pty Ltd

PROJECT: QLD_0229_PFASOMP_20

SITE: QLD_0229

ORDER NO:

PROJECT MANAGER: Lucy Muir

PRIMARY SAMPLER: Rachel Russell

CONTACT PH:

SAMPLER MOBILE:

QUOTE NO: TV/007/21 - Compass

/ ET2021AECOMAU000

1

EMAIL REPORTS TO: Lucy.muir1@aecom.com, derp.labreport@esdat.com.au, carina.jakobi@aecom.com, rachel.russell@aecom.com, lachlan.mccannel@aecom.com

EMAIL INVOICES TO: carina.jakobi@aecom.com, lucy.muir1@aecom.com

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	ANALYSIS REQUIRED			
							Sediments SEDIMENT	Waters WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
037	0229_SD121_210329		29/03/2021 03:18 PM	Soil	ALS: 1 Non ALS: 0	No	Partial 1/4			
038	0229_SD135_210329		29/03/2021 03:34 PM	Soil	ALS: 1 Non ALS: 0	No	Partial 1/4			
039	0229_SW135_210329		29/03/2021 03:37 PM	Water	ALS: 2 Non ALS: 0	No		Partial 1/4		
040	0229_SD133_210329		29/03/2021 03:47 PM	Soil	ALS: 1 Non ALS: 0	No	Partial 1/4			

**CHAIN OF CUSTODY**

COC#: 20785 ALS Laboratory: ET Townsville

RELINQUISHED BY:
DATE TIME:RECEIVED BY:
DATE TIME:RELINQUISHED BY:
DATE TIME:RECEIVED BY:
DATE TIME:CLIENT: AECOMAU - AECOM Australia Pty Ltd
PROJECT: QLD_0229_PFASOMP_20
SITE: QLD_0229
ORDER NO: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:
PRIMARY SAMPLER:CONTACT PH:
QUOTE NO: TV/007/21 - Compass
SAMPLER MOBILE:
/ ET2021AECOMAU000
1

EMAIL REPORTS TO:

EMAIL INVOICES TO:

SAMPLE	SAMPLE NAME	PARTIAL ANALYSIS GROUP NAME	MATRIX	SELECTED ANALYSIS NAME
001	0229_QC501_210329	Waters WATER	Water	- EP231X PFAS - Full Suite (28 analytes)
002	0229_SW232_210329	Waters WATER	Water	- EP231X PFAS - Full Suite (28 analytes)
003	0229_SW242_210329	Waters WATER	Water	- EP231X PFAS - Full Suite (28 analytes)
004	0229_SW205_210329	Waters WATER	Water	- EP231X PFAS - Full Suite (28 analytes)
005	0229_SW233_210329	Waters WATER	Water	- EP231X PFAS - Full Suite (28 analytes)
006	0229_SW217_210329	Waters WATER	Water	- EP231X PFAS - Full Suite (28 analytes)
007	0229_SW243_210329	Waters WATER	Water	- EP231X PFAS - Full Suite (28 analytes)
008	0229_SW203_210329	Waters WATER	Water	- EP231X PFAS - Full Suite (28 analytes)
009	0229_QC102_210329	Waters WATER	Water	- EP231X PFAS - Full Suite (28 analytes)
010	0229_SD242_210329	Sediments SEDIMENT	Soil	- EP231X (solids) PFAS - Full Suite (28 analytes)
011	0229_SD203_210329	Sediments SEDIMENT	Soil	- EP231X (solids) PFAS - Full Suite (28 analytes)
012	0229_SD232_210329	Sediments SEDIMENT	Soil	- EP231X (solids) PFAS - Full Suite (28 analytes)
013	0229_SD205_210329	Sediments SEDIMENT	Soil	- EP231X (solids) PFAS - Full Suite (28 analytes)
014	0229_SD217_210329	Sediments SEDIMENT	Soil	- EP231X (solids) PFAS - Full Suite (28 analytes)
015	0229_SD243_210329	Sediments SEDIMENT	Soil	- EP231X (solids) PFAS - Full Suite (28 analytes)

**CHAIN OF CUSTODY**

COC#: 20785 ALS Laboratory: ET Townsville

RELINQUISHED BY:

RECEIVED BY:

RELINQUISHED BY:

RECEIVED BY:

DATE TIME:

DATE TIME:

DATE TIME:

DATE TIME:

CLIENT: AECOMAU - AECOM Australia Pty Ltd

PROJECT: QLD_0229_PFASOMP_20

SITE: QLD_0229

ORDER NO:

PROJECT MANAGER: [REDACTED]
PRIMARY SAMPLER: [REDACTED]CONTACT PH: [REDACTED] SAMPLER MOBILE: [REDACTED]
QUOTE NO: TV/007/21 - Compass / ET2021AECOMAU000
1

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

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

Random Sample Temperature on Receipt: C

Other comments:

EMAIL REPORTS TO: [REDACTED]

EMAIL INVOICES TO: [REDACTED]

016	0229_SD233_210329	Sediments SEDIMENT	Soil	- EP231X (solids) PFAS - Full Suite (28 analytes)
017	0229_QC103_210329	Sediments SEDIMENT	Soil	- EP231X (solids) PFAS - Full Suite (28 analytes)
018	0229_SW119_210329	Waters WATER	Water	- EP231X PFAS - Full Suite (28 analytes)
019	0229_SD119_210329	Sediments SEDIMENT	Soil	- EP231X (solids) PFAS - Full Suite (28 analytes)
020	0229_SD120_210329	Sediments SEDIMENT	Soil	- EP231X (solids) PFAS - Full Suite (28 analytes)
021	0229_SW120_210329	Waters WATER	Water	- EP231X PFAS - Full Suite (28 analytes)
022	0229_SD137_210329	Sediments SEDIMENT	Soil	- EP231X (solids) PFAS - Full Suite (28 analytes)
023	0229_SW137_210329	Waters WATER	Water	- EP231X PFAS - Full Suite (28 analytes)
024	0229_SD113_210329	Sediments SEDIMENT	Soil	- EP231X (solids) PFAS - Full Suite (28 analytes)
025	0229_SW113_210329	Waters WATER	Water	- EP231X PFAS - Full Suite (28 analytes)
026	0229_SD109_210329	Sediments SEDIMENT	Soil	- EP231X (solids) PFAS - Full Suite (28 analytes)
027	0229_SW109_210329	Waters WATER	Water	- EP231X PFAS - Full Suite (28 analytes)
028	0229_SD110_210329	Sediments SEDIMENT	Soil	- EP231X (solids) PFAS - Full Suite (28 analytes)
029	0229_SW110_210329	Waters WATER	Water	- EP231X PFAS - Full Suite (28 analytes)
030	0229_SW139_210329	Waters WATER	Water	- EP231X PFAS - Full Suite (28 analytes)
031	0229_QC104_210329	Waters WATER	Water	- EP231X PFAS - Full Suite (28 analytes)

**CHAIN OF CUSTODY**

COC#: 20785 ALS Laboratory: ET Townsville

RELINQUISHED BY:

RECEIVED BY:

RELINQUISHED BY:

RECEIVED BY:

DATE TIME:

DATE TIME:

DATE TIME:

DATE TIME:

CLIENT: AECOMAU - AECOM Australia Pty Ltd

PROJECT: QLD_0229_PFASOMP_20

SITE: QLD_0229

ORDER NO:

PROJECT MANAGER:

PRIMARY SAMPLER:

EMAIL REPORTS TO:

EMAIL INVOICES TO:

CONTACT PH:

QUOTE NO: TV/007/21 - Compass

SAMPLER MOBILE:

/ ET2021AECOMAU000

1

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact?

Yes No N/A

Free ice / frozen ice bricks present upon receipt?

Yes No N/A

Random Sample Temperature on Receipt:

°C

Other comments:

032	0229_SD139_210329	Sediments SEDIMENT	Soil	- EP231X (solids) PFAS - Full Suite (28 analytes)
033	0229_QC105_210329	Sediments SEDIMENT	Soil	- EP231X (solids) PFAS - Full Suite (28 analytes)
034	0229_SW140_210329	Waters WATER	Water	- EP231X PFAS - Full Suite (28 analytes)
035	0229_SD140_210329	Sediments SEDIMENT	Soil	- EP231X (solids) PFAS - Full Suite (28 analytes)
036	0229_SW121_210329	Waters WATER	Water	- EP231X PFAS - Full Suite (28 analytes)
037	0229_SD121_210329	Sediments SEDIMENT	Soil	- EP231X (solids) PFAS - Full Suite (28 analytes)
038	0229_SD135_210329	Sediments SEDIMENT	Soil	- EP231X (solids) PFAS - Full Suite (28 analytes)
039	0229_SW135_210329	Waters WATER	Water	- EP231X PFAS - Full Suite (28 analytes)
040	0229_SD133_210329	Sediments SEDIMENT	Soil	- EP231X (solids) PFAS - Full Suite (28 analytes)

**CHAIN OF CUSTODY**

COC#: 20785 ALS Laboratory: ET Townsville

RELINQUISHED BY:

RECEIVED BY:

RELINQUISHED BY:

RECEIVED BY:

DATE TIME:

DATE TIME:

DATE TIME:

DATE TIME:

CLIENT: AECOMAU - AECOM Australia Pty Ltd

PROJECT: QLD_0229_PFSOMP_20

SITE: QLD_0229

ORDER NO:

PROJECT MANAGER:

PRIMARY SAMPLER:

EMAIL REPORTS TO:

EMAIL INVOICES TO:

CONTACT PH:

SAMPLER MOBILE:

QUOTE NO: TV/007/21 - Compass

/ ET2021AECOMAU000

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	0229_QC501_210329	HDPE (no PTFE)	20 mL	00352010010139	Grey	No	
001	0229_QC501_210329	HDPE (no PTFE)	20 mL	00352010034586	Grey	No	
002	0229_SW232_210329	HDPE (no PTFE)	20 mL	00350719030160	Grey	No	
002	0229_SW232_210329	HDPE (no PTFE)	20 mL	00350719030245	Grey	No	
003	0229_SW242_210329	HDPE (no PTFE)	20 mL	00351219044665	Grey	No	
003	0229_SW242_210329	HDPE (no PTFE)	20 mL	00351219044703	Grey	No	
004	0229_SW205_210329	HDPE (no PTFE)	20 mL	00350719030281	Grey	No	
004	0229_SW205_210329	HDPE (no PTFE)	20 mL	00350719030283	Grey	No	
005	0229_SW233_210329	HDPE (no PTFE)	20 mL	00350719030354	Grey	No	
005	0229_SW233_210329	HDPE (no PTFE)	20 mL	00350719030287	Grey	No	
006	0229_SW217_210329	HDPE (no PTFE)	20 mL	00350719030094	Grey	No	
006	0229_SW217_210329	HDPE (no PTFE)	20 mL	00350719030088	Grey	No	
007	0229_SW243_210329	HDPE (no PTFE)	20 mL	00350719030264	Grey	No	
007	0229_SW243_210329	HDPE (no PTFE)	20 mL	00350719030315	Grey	No	
008	0229_SW203_210329	HDPE (no PTFE)	20 mL	00351219044524	Grey	No	
008	0229_SW203_210329	HDPE (no PTFE)	20 mL	00351219044671	Grey	No	
009	0229_QC102_210329	HDPE (no PTFE)	20 mL	00351219044517	Grey	No	
009	0229_QC102_210329	HDPE (no PTFE)	20 mL	00351219044594	Grey	No	
010	0229_SD242_210329	HDPE Soil Jar	200 mL	00620719071687	Grey	No	
011	0229_SD203_210329	HDPE Soil Jar	200 mL	00620719071624	Grey	No	
012	0229_SD232_210329	HDPE Soil Jar	200 mL	00620719071691	Grey	No	
013	0229_SD205_210329	HDPE Soil Jar	200 mL	00620719071657	Grey	No	
014	0229_SD217_210329	HDPE Soil Jar	200 mL	00620719071653	Grey	No	
015	0229_SD243_210329	HDPE Soil Jar	200 mL	00620719071634	Grey	No	
016	0229_SD233_210329	HDPE Soil Jar	200 mL	00620719071642	Grey	No	
017	0229_QC103_210329	HDPE Soil Jar	200 mL	00620719071570	Grey	No	

**CHAIN OF CUSTODY**

COC#: 20785 ALS Laboratory: ET Townsville

RELINQUISHED BY:

DATE TIME:
RECEIVED BY:

DATE TIME:
RELINQUISHED BY:

DATE TIME:
RECEIVED BY:

DATE TIME:

CLIENT: AECOMAU - AECOM Australia Pty Ltd

PROJECT: QLD_0229_PFASOMP_20

SITE: QLD_0229

ORDER NO:

PROJECT MANAGER: [REDACTED]
PRIMARY SAMPLER: [REDACTED]CONTACT PH: [REDACTED] SAMPLER MOBILE: [REDACTED]
QUOTE NO: TV/007/21 - Compass / ET2021AECOMAU0001

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	0229_SW119_210329	HDPE (no PTFE)	20 mL	00350719030294	Grey	No	
018	0229_SW119_210329	HDPE (no PTFE)	20 mL	00350719030351	Grey	No	
019	0229_SD119_210329	HDPE Soil Jar	200 mL	00620719071623	Grey	No	
020	0229_SD120_210329	HDPE Soil Jar	200 mL	00620719071635	Grey	No	
021	0229_SW120_210329	HDPE (no PTFE)	20 mL	00350719030107	Grey	No	
021	0229_SW120_210329	HDPE (no PTFE)	20 mL	00350719030136	Grey	No	
022	0229_SD137_210329	HDPE Soil Jar	200 mL	00620719071694	Grey	No	
023	0229_SW137_210329	HDPE (no PTFE)	20 mL	00350719028046	Grey	No	
023	0229_SW137_210329	HDPE (no PTFE)	20 mL	00350719028133	Grey	No	
024	0229_SD113_210329	HDPE Soil Jar	200 mL	00620719071686	Grey	No	
025	0229_SW113_210329	HDPE (no PTFE)	20 mL	00350719028320	Grey	No	
025	0229_SW113_210329	HDPE (no PTFE)	20 mL	00350719028305	Grey	No	
026	0229_SD109_210329	HDPE Soil Jar	200 mL	00620719071617	Grey	No	
027	0229_SW109_210329	HDPE (no PTFE)	20 mL	00351219044600	Grey	No	
027	0229_SW109_210329	HDPE (no PTFE)	20 mL	00351219044507	Grey	No	
028	0229_SD110_210329	HDPE Soil Jar	200 mL	00620719071684	Grey	No	
029	0229_SW110_210329	HDPE (no PTFE)	20 mL	00350719030180	Grey	No	
029	0229_SW110_210329	HDPE (no PTFE)	20 mL	00350719030103	Grey	No	
030	0229_SW139_210329	HDPE (no PTFE)	20 mL	00351219044541	Grey	No	
030	0229_SW139_210329	HDPE (no PTFE)	20 mL	00351219044603	Grey	No	
030	0229_SW139_210329	HDPE (no PTFE)	20 mL	00350719028341	Grey	No	
030	0229_SW139_210329	HDPE (no PTFE)	20 mL	00350719028340	Grey	No	
031	0229_QC104_210329	HDPE (no PTFE)	20 mL	00350719028265	Grey	No	
031	0229_QC104_210329	HDPE (no PTFE)	20 mL	00350719028217	Grey	No	
032	0229_SD139_210329	HDPE Soil Jar	200 mL	00620719071572	Grey	No	
033	0229_QC105_210329	HDPE Soil Jar	200 mL	00620719071652	Grey	No	
034	0229_SW140_210329	HDPE (no PTFE)	20 mL	00351219044572	Grey	No	

**CHAIN OF CUSTODY**

ALS COC#: 20785 ALS Laboratory: ET Townsville

CLIENT: AECOMAU - AECOM Australia Pty Ltd

PROJECT: QLD_0229_PFASOMP_20

SITE: QLD_0229

ORDER NO:

PROJECT MANAGER: [REDACTED]
PRIMARY SAMPLER: [REDACTED]

EMAIL REPORTS TO: [REDACTED]

EMAIL INVOICES TO: [REDACTED]

RELINQUISHED BY:

DATE TIME:

RECEIVED BY:

DATE TIME:

RELINQUISHED BY:

DATE TIME:

RECEIVED BY:

DATE TIME:

TURNAROUND REQUIREMENTS: 5 Days

Biohazard info:

CONTACT PH: SAMPLER MOBILE:
QUOTE NO: TV/007/21 - Compass / ET2021AECOMAU000
1**LABORATORY USE ONLY (Circle)**

Custody Seal intact? Yes No N/A

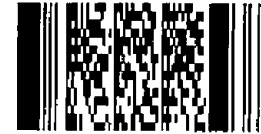
Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comments:


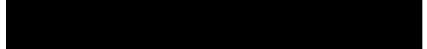
034	0229_SW140_210329	HDPE (no PTFE)	20 mL	00351219044661	Grey	No	
034	0229_SW140_210329	HDPE (no PTFE)	20 mL	00351219044699	Grey	No	
034	0229_SW140_210329	HDPE (no PTFE)	20 mL	00351219044642	Grey	No	
035	0229_SD140_210329	HDPE Soil Jar	200 mL	00620719071606	Grey	No	
036	0229_SW121_210329	HDPE (no PTFE)	20 mL	00351219044694	Grey	No	
036	0229_SW121_210329	HDPE (no PTFE)	20 mL	00351219044689	Grey	No	
036	0229_SW121_210329	HDPE (no PTFE)	20 mL	00350719028301	Grey	No	
036	0229_SW121_210329	HDPE (no PTFE)	20 mL	00350719028313	Grey	No	
037	0229_SD121_210329	HDPE Soil Jar	200 mL	00620719071632	Grey	No	
038	0229_SD135_210329	HDPE Soil Jar	200 mL	00620719071679	Grey	No	
039	0229_SW135_210329	HDPE (no PTFE)	20 mL	00350719028247	Grey	No	
039	0229_SW135_210329	HDPE (no PTFE)	20 mL	00350719028291	Grey	No	
040	0229_SD133_210329	HDPE Soil Jar	200 mL	00620719071672	Grey	No	

Total Bottle Count: ALS: 66, Non ALS: 0



Telephone : +61 7 4773 0000


Custody Document for Submissions via ALS Compass App

Project: QLD_0229_PFA50MP_20 Client: AELOM Project Manager: 
ALS Compass COC Reference: 20924 # Samples: 55 Sampler: 
Turnaround Requirements: Standard Urgent

Special Instructions:

*Please double check dates — Should be as per sample IDs
(especially for 29/3/21 and 30/3/21)*

Custody:

Relinquished by:	Received by:	Relinquished by:	Received by:
Date / Time:	Date / Time:	Date / Time:	Date / Time:
	 1/4/21 11:55		

**CHAIN OF CUSTODY**

COC#: 20924 ALS Laboratory: ET Townsville

RELINQUISHED BY:

RECEIVED BY:

RELINQUISHED BY:

RECEIVED BY:

DATE TIME:

DATE TIME:

DATE TIME:

DATE TIME:

CLIENT: AECOMAU - AECOM Australia Pty Ltd

PROJECT: QLD_0229_PFSOMP_20

SITE: QLD_0229

ORDER NO:

PROJECT MANAGER: [REDACTED]
PRIMARY SAMPLER: [REDACTED]CONTACT PH: [REDACTED] SAMPLER MOBILE: [REDACTED]
QUOTE NO: TV/007/21 - Compass / ET2021AECOMAU000
1

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

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

Random Sample Temperature on Receipt: °C

Other comments:

EMAIL REPORTS TO: [REDACTED]

EMAIL INVOICES TO: [REDACTED]

SAMPLE DETAILS**ANALYSIS REQUIRED**

SAMPLE	NAME	DESCRIPTION	DATE / TIME	MATRIX	TOTAL BOTTLES	ON HOLD	ANALYSIS REQUIRED			ADDITIONAL INFORMATION
							Sediments SEDIMENT	Waters WATER	ALTERNATIVE ANALYSIS	
001	0229_MW002_210331		31/03/2021 04:16 PM	Water	ALS: 2 Non ALS: 0	No		Partial 1/4		
002	0229_MW114_210331		31/03/2021 04:17 PM	Water	ALS: 2 Non ALS: 0	No		Partial 1/4		
003	0229_MW139_210331		31/03/2021 04:18 PM	Water	ALS: 4 Non ALS: 0	No		Partial 1/4		
004	0229_MW120_210331		31/03/2021 04:19 PM	Water	ALS: 2 Non ALS: 0	No		Partial 1/4		
005	0229_MW106_210331		31/03/2021 04:20 PM	Water	ALS: 2 Non ALS: 0	No		Partial 1/4		
006	0229_MW072_210331		31/03/2021 04:21 PM	Water	ALS: 2 Non ALS: 0	No		Partial 1/4		
007	0229_MW138_210331		31/03/2021 04:22 PM	Water	ALS: 2 Non ALS: 0	No		Partial 1/4		
008	0229_MW131_210331		31/03/2021 04:22 PM	Water	ALS: 2 Non ALS: 0	No		Partial 1/4		
009	0229_MW128_210331		31/03/2021 04:23 PM	Water	ALS: 2 Non ALS: 0	No		Partial 1/4		

**CHAIN OF CUSTODY**

COC#: 20924 ALS Laboratory: ET Townsville

RELINQUISHED BY:

RECEIVED BY:

RELINQUISHED BY:

RECEIVED BY:

DATE TIME:

DATE TIME:

DATE TIME:

DATE TIME:

CLIENT: AECOMAU - AECOM Australia Pty Ltd

PROJECT: QLD_0229_PFSOMP_20

SITE: QLD_0229

ORDER NO:

PROJECT MANAGER:

PRIMARY SAMPLER:

CONTACT PH:

QUOTE NO: TV/007/21 - Compass

SAMPLER MOBILE:

/ ET2021AECOMAU000
1

EMAIL REPORTS TO:

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	ANALYSIS REQUIRED			ADDITIONAL INFORMATION
							Sediments SEDIMENT	Waters WATER	ALTERNATIVE ANALYSIS	
010	0229_MW101_210331		31/03/2021 04:24 PM	Water	ALS: 2 Non ALS: 0	No		Partial 1/4		
011	0229_MW105_210331		31/03/2021 04:25 PM	Water	ALS: 2 Non ALS: 0	No		Partial 1/4		
012	0229_MW115_210331		31/03/2021 04:26 PM	Water	ALS: 2 Non ALS: 0	No		Partial 1/4		
013	0229_MW074_210331		31/03/2021 04:27 PM	Water	ALS: 2 Non ALS: 0	No		Partial 1/4		
014	0229_MW121_210331		31/03/2021 04:28 PM	Water	ALS: 2 Non ALS: 0	No		Partial 1/4		
015	0229_MW018_210331		31/03/2021 04:28 PM	Water	ALS: 2 Non ALS: 0	No		Partial 1/4		
016	0229_MW135_210331		31/03/2021 04:29 PM	Water	ALS: 2 Non ALS: 0	No		Partial 1/4		
017	0229_MW141_210331		31/03/2021 04:31 PM	Water	ALS: 4 Non ALS: 0	No		Partial 1/4		
018	0229_MW102_210331		31/03/2021 04:33 PM	Water	ALS: 4 Non ALS: 0	No		Partial 1/4		

**CHAIN OF CUSTODY**

COC#: 20924 ALS Laboratory: ET Townsville

RELINQUISHED BY:

RECEIVED BY:

RELINQUISHED BY:

RECEIVED BY:

DATE TIME:

DATE TIME:

DATE TIME:

DATE TIME:

CLIENT: AECOMAU - AECOM Australia Pty Ltd

PROJECT: QLD_0229_PFSOMP_20

SITE: QLD_0229

ORDER NO:

PROJECT MANAGER:

PRIMARY SAMPLER:

CONTACT PH:

QUOTE NO: TV/007/21 - Compass

SAMPLER MOBILE:

/ ET2021AECOMAU000

1

EMAIL REPORTS TO:

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	ANALYSIS REQUIRED			ADDITIONAL INFORMATION
							Sediments SEDIMENT	Waters WATER	ALTERNATIVE ANALYSIS	
019	0229_MW116_210331		31/03/2021 04:34 PM	Water	ALS: 4 Non ALS: 0	No		Partial 1/4		
020	0229_QC502_210331		31/03/2021 04:35 PM	Water	ALS: 2 Non ALS: 0	No		Partial 1/4		
021	0229_MW1251_210331		31/03/2021 04:34 PM	Water	ALS: 2 Non ALS: 0	No		Partial 1/4		
022	0229_QC108_210331		31/03/2021 04:37 PM	Water	ALS: 2 Non ALS: 0	No		Partial 1/4		
023	0229_QC109_210331		31/03/2021 04:38 PM	Water	ALS: 2 Non ALS: 0	No		Partial 1/4		
024	0229_MW003_210331		31/03/2021 04:37 PM	Water	ALS: 4 Non ALS: 0	No		X		Extra lab volume
025	0229_QC106_210331		31/03/2021 04:39 PM	Water	ALS: 2 Non ALS: 0	No		Partial 1/4		
026	0229_MW212_210331		31/03/2021 04:41 PM	Water	ALS: 2 Non ALS: 0	No		Partial 1/4		
027	0229_QC303_210331		31/03/2021 04:41 PM	Water	ALS: 4 Non ALS: 0	No		Partial 1/4		

**CHAIN OF CUSTODY**

COC#: 20924 ALS Laboratory: ET Townsville

RELINQUISHED BY:

RECEIVED BY:

RELINQUISHED BY:

RECEIVED BY:

DATE TIME:

DATE TIME:

DATE TIME:

DATE TIME:

CLIENT: AECOMAU - AECOM Australia Pty Ltd

PROJECT: QLD_0229_PFASOMP_20

SITE: QLD_0229

ORDER NO:

PROJECT MANAGER:

PRIMARY SAMPLER:

EMAIL REPORTS TO:

EMAIL INVOICES TO:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

CONTACT PH:

QUOTE NO: TV/007/21 - Compass

SAMPLER MOBILE:

/ ET2021AECOMAU000

1

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	ANALYSIS REQUIRED			ADDITIONAL INFORMATION
							Sediments SEDIMENT	Waters WATER	ALTERNATIVE ANALYSIS	
028	0229_QC301_210329		31/03/2021 04:42 PM	Water	ALS: 2 Non ALS: 0	No		Partial 1/4		
029	0229_MW125S_210331		31/03/2021 04:45 PM	Water	ALS: 4 Non ALS: 0	No		Partial 1/4		
030	0229_MW205S_210331		31/03/2021 04:47 PM	Water	ALS: 2 Non ALS: 0	No		Partial 1/4		
031	0229_QC107_210331		31/03/2021 04:49 PM	Water	ALS: 2 Non ALS: 0	No		Partial 1/4		
032	0229_MW065_210331		31/03/2021 04:49 PM	Water	ALS: 2 Non ALS: 0	No		Partial 1/4		
033	0229_MW233_210331		31/03/2021 04:50 PM	Water	ALS: 2 Non ALS: 0	No		Partial 1/4		
034	0229_MW1231_210331		31/03/2021 04:52 PM	Water	ALS: 2 Non ALS: 0	No		Partial 1/4		
035	0229_QC304_210331		31/03/2021 04:50 PM	Water	ALS: 2 Non ALS: 0	No		Partial 1/4		
036	0229_MW236S_210331		31/03/2021 04:52 PM	Water	ALS: 4 Non ALS: 0	No		Partial 1/4		Extra lab volume

**CHAIN OF CUSTODY**

COC#: 20924 ALS Laboratory: ET Townsville

RELINQUISHED BY:

RECEIVED BY:

RELINQUISHED BY:

RECEIVED BY:

DATE TIME:

DATE TIME:

DATE TIME:

DATE TIME:

CLIENT: AECOMAU - AECOM Australia Pty Ltd

PROJECT: QLD_0229_PFASOMP_20

SITE: QLD_0229

ORDER NO:

PROJECT MANAGER: [REDACTED]

PRIMARY SAMPLER: [REDACTED]

EMAIL REPORTS TO: [REDACTED]

EMAIL INVOICES TO: [REDACTED]

CONTACT PH: SAMPLER MOBILE:
QUOTE NO: TV/007/21 - Compass / ET2021AECOMAU000
1

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)Custody Seal intact? Yes No N/A
Free ice / frozen ice bricks present upon receipt? Yes No N/A
Random Sample Temperature on Receipt: °C
Other comments:**SAMPLE DETAILS****ANALYSIS REQUIRED**

SAMPLE	NAME	DESCRIPTION	DATE / TIME	MATRIX	TOTAL BOTTLES	ON HOLD	ANALYSIS REQUIRED			
							Sediments SEDIMENT	Waters WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
037	0229_MW123S_210331		31/03/2021 04:53 PM	Water	ALS: 2 Non ALS: 0	No		Partial 1/4		
038	0229_MW122_210331		31/03/2021 04:53 PM	Water	ALS: 2 Non ALS: 0	No		Partial 1/4		
039	0229_MW217_210331		31/03/2021 04:54 PM	Water	ALS: 2 Non ALS: 0	No		Partial 1/4		
040	0229_MW225S_210331		31/03/2021 04:55 PM	Water	ALS: 4 Non ALS: 0	No		Partial 1/4		
041	0229_MW232_210331		31/03/2021 04:55 PM	Water	ALS: 4 Non ALS: 0	No		Partial 1/4		
042	0229_MW119_210330		31/03/2021 04:56 PM	Water	ALS: 2 Non ALS: 0	No		Partial 1/4		
043	0229_MW118_210330		31/03/2021 04:58 PM	Water	ALS: 2 Non ALS: 0	No		Partial 2/4		
044	0229_MW117S_210330		31/03/2021 04:58 PM	Water	ALS: 4 Non ALS: 0	No		Partial 1/4		
045	0229_QC302_210330		31/03/2021 05:01 PM	Water	ALS: 2 Non ALS: 0	No		Partial 1/4		

**CHAIN OF CUSTODY**

ALS COC#: 20924 ALS Laboratory: ET Townsville

RELINQUISHED BY:

RECEIVED BY:

RELINQUISHED BY:

RECEIVED BY:

DATE TIME:

DATE TIME:

DATE TIME:

DATE TIME:

CLIENT: AECOMAU - AECOM Australia Pty Ltd

PROJECT: QLD_0229_PFSOMP_20

SITE: QLD_0229

ORDER NO:

PROJECT MANAGER:

PRIMARY SAMPLER:

EMAIL REPORTS TO:

EMAIL INVOICES TO:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

CONTACT PH:

QUOTE NO: TV/007/21 - Compass

SAMPLER MOBILE:

/ ET2021AECOMAU000

1

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	ANALYSIS REQUIRED			ADDITIONAL INFORMATION
							Sediments SEDIMENT	Waters WATER	ALTERNATIVE ANALYSIS	
046	0229_SW220_210401		01/04/2021 07:40 AM	Water	ALS: 2 Non ALS: 0	No		Partial 1/4		
047	0229_SD220_210401		01/04/2021 07:41 AM	Soil	ALS: 1 Non ALS: 0	No	Partial 1/4			
048	0229_MW220S_210401		01/04/2021 07:52 AM	Water	ALS: 2 Non ALS: 0	No		Partial 1/4		
049	0229_SW134_210401		01/04/2021 09:17 AM	Water	ALS: 2 Non ALS: 0	No		Partial 1/4		
050	0229_SD134_210401		01/04/2021 09:19 AM	Soil	ALS: 1 Non ALS: 0	No		Partial 1/4		
051	0229_SW132_210401		01/04/2021 09:36 AM	Water	ALS: 2 Non ALS: 0	No		Partial 1/4		
052	0229_SD132_210401		01/04/2021 09:37 AM	Soil	ALS: 1 Non ALS: 0	No	Partial 1/4			
053	0229_QC305_210401		01/04/2021 11:20 AM	Water	ALS: 2 Non ALS: 0	No		Partial 1/4		
054	0229_MW117D_210330		30/03/2021 11:38 AM	Water	ALS: 2 Non ALS: 0	No		Partial 1/4		

**CHAIN OF CUSTODY**

COC#: 20924 ALS Laboratory: ET Townsville

RELINQUISHED BY:

RECEIVED BY:

RELINQUISHED BY:

RECEIVED BY:

DATE TIME:

DATE TIME:

DATE TIME:

DATE TIME:

CLIENT: AECOMAU - AECOM Australia Pty Ltd

PROJECT: QLD_0229_PFASOMP_20

SITE: QLD_0229

ORDER NO:

PROJECT MANAGER: [REDACTED]

PRIMARY SAMPLER: [REDACTED]

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:

CONTACT PH: SAMPLER MOBILE:
QUOTE NO: TV/007/21 - Compass / ET2021AECOMAU000
1**SAMPLE DETAILS****ANALYSIS REQUIRED**

SAMPLE	NAME	DESCRIPTION	DATE / TIME	MATRIX	TOTAL BOTTLES	ON HOLD	ANALYSIS REQUIRED			ADDITIONAL INFORMATION
							Sediments SEDIMENT	Waters WATER	ALTERNATIVE ANALYSIS	
055	0229_MW124_210331		31/03/2021 11:40 AM	Water	ALS: 2 Non ALS: 0	No		Partial 1/4		

**CHAIN OF CUSTODY**

COC#: 20924 ALS Laboratory: ET Townsville

RELINQUISHED BY:

DATE TIME:
RECEIVED BY:

DATE TIME:
RELINQUISHED BY:

DATE TIME:
RECEIVED BY:

DATE TIME:

CLIENT: AECOMAU - AECOM Australia Pty Ltd

PROJECT: QLD_0229_PFASOMP_20

SITE: QLD_0229

ORDER NO:

PROJECT MANAGER: [REDACTED]
PRIMARY SAMPLER: [REDACTED]
CONTACT PH: [REDACTED] SAMPLER MOBILE: [REDACTED]
QUOTE NO: TV/007/21 - Compass / ET2021AECOMAU000
1

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

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

Random Sample Temperature on Receipt: C

Other comments:

EMAIL REPORTS TO: [REDACTED]

EMAIL INVOICES TO: [REDACTED]

SAMPLE	SAMPLE NAME	PARTIAL ANALYSIS GROUP NAME	MATRIX	SELECTED ANALYSIS NAME
001	0229_MW002_210331	Waters WATER	Water	- EP231X PFAS - Full Suite (28 analytes)
002	0229_MW114_210331	Waters WATER	Water	- EP231X PFAS - Full Suite (28 analytes)
003	0229_MW139_210331	Waters WATER	Water	- EP231X PFAS - Full Suite (28 analytes)
004	0229_MW120_210331	Waters WATER	Water	- EP231X PFAS - Full Suite (28 analytes)
005	0229_MW106_210331	Waters WATER	Water	- EP231X PFAS - Full Suite (28 analytes)
006	0229_MW072_210331	Waters WATER	Water	- EP231X PFAS - Full Suite (28 analytes)
007	0229_MW138_210331	Waters WATER	Water	- EP231X PFAS - Full Suite (28 analytes)
008	0229_MW131_210331	Waters WATER	Water	- EP231X PFAS - Full Suite (28 analytes)
009	0229_MW128_210331	Waters WATER	Water	- EP231X PFAS - Full Suite (28 analytes)
010	0229_MW101_210331	Waters WATER	Water	- EP231X PFAS - Full Suite (28 analytes)
011	0229_MW105_210331	Waters WATER	Water	- EP231X PFAS - Full Suite (28 analytes)
012	0229_MW115_210331	Waters WATER	Water	- EP231X PFAS - Full Suite (28 analytes)
013	0229_MW074_210331	Waters WATER	Water	- EP231X PFAS - Full Suite (28 analytes)
014	0229_MW121_210331	Waters WATER	Water	- EP231X PFAS - Full Suite (28 analytes)
015	0229_MW018_210331	Waters WATER	Water	- EP231X PFAS - Full Suite (28 analytes)

**CHAIN OF CUSTODY**

COC#: 20924 ALS Laboratory: ET Townsville

RELINQUISHED BY:

RECEIVED BY:

RELINQUISHED BY:

RECEIVED BY:

DATE TIME:

DATE TIME:

DATE TIME:

DATE TIME:

CLIENT: AECOMAU - AECOM Australia Pty Ltd

PROJECT: QLD_0229_PFASOMP_20

SITE: QLD_0229

ORDER NO:

PROJECT MANAGER:

PRIMARY SAMPLER:

EMAIL REPORTS TO:

EMAIL INVOICES TO:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

CONTACT PH:

QUOTE NO: TV/007/21 - Compass

SAMPLER MOBILE:

/ ET2021AECOMAU000

1

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	0229_MW135_210331	Waters WATER	Water	- EP231X PFAS - Full Suite (28 analytes)
017	0229_MW141_210331	Waters WATER	Water	- EP231X PFAS - Full Suite (28 analytes)
018	0229_MW102_210331	Waters WATER	Water	- EP231X PFAS - Full Suite (28 analytes)
019	0229_MW116_210331	Waters WATER	Water	- EP231X PFAS - Full Suite (28 analytes)
020	0229_QC502_210331	Waters WATER	Water	- EP231X PFAS - Full Suite (28 analytes)
021	0229_MW125L_210331	Waters WATER	Water	- EP231X PFAS - Full Suite (28 analytes)
022	0229_QC108_210331	Waters WATER	Water	- EP231X PFAS - Full Suite (28 analytes)
023	0229_QC109_210331	Waters WATER	Water	- EP231X PFAS - Full Suite (28 analytes)
025	0229_QC106_210331	Waters WATER	Water	- EP231X PFAS - Full Suite (28 analytes)
026	0229_MW212_210331	Waters WATER	Water	- EP231X PFAS - Full Suite (28 analytes)
027	0229_QC303_210331	Waters WATER	Water	- EP231X PFAS - Full Suite (28 analytes)
028	0229_QC301_210329	Waters WATER	Water	- EP231X PFAS - Full Suite (28 analytes)
029	0229_MW125S_210331	Waters WATER	Water	- EP231X PFAS - Full Suite (28 analytes)
030	0229_MW205S_210331	Waters WATER	Water	- EP231X PFAS - Full Suite (28 analytes)
031	0229_QC107_210331	Waters WATER	Water	- EP231X PFAS - Full Suite (28 analytes)
032	0229_MW065_210331	Waters WATER	Water	- EP231X PFAS - Full Suite (28 analytes)

**CHAIN OF CUSTODY**

ALS COC#: 20924 ALS Laboratory: ET Townsville

RELINQUISHED BY:

RECEIVED BY:

RELINQUISHED BY:

RECEIVED BY:

DATE TIME:

DATE TIME:

DATE TIME:

DATE TIME:

CLIENT: AECOMAU - AECOM Australia Pty Ltd

PROJECT: QLD_0229_PFASOMP_20

SITE: QLD_0229

ORDER NO:

PROJECT MANAGER:

PRIMARY SAMPLER:

EMAIL REPORTS TO:

EMAIL INVOICES TO:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

CONTACT PH:

QUOTE NO: TV/007/21 - Compass

SAMPLER MOBILE:

/ ET2021AECOMAU000
1**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:

033	0229_MW233_210331	Waters WATER	Water	- EP231X PFAS - Full Suite (28 analytes)
034	0229_MW1231_210331	Waters WATER	Water	- EP231X PFAS - Full Suite (28 analytes)
035	0229_QC304_210331	Waters WATER	Water	- EP231X PFAS - Full Suite (28 analytes)
036	0229_MW236S_210331	Waters WATER	Water	- EP231X PFAS - Full Suite (28 analytes)
037	0229_MW123S_210331	Waters WATER	Water	- EP231X PFAS - Full Suite (28 analytes)
038	0229_MW122_210331	Waters WATER	Water	- EP231X PFAS - Full Suite (28 analytes)
039	0229_MW217_210331	Waters WATER	Water	- EP231X PFAS - Full Suite (28 analytes)
040	0229_MW225S_210331	Waters WATER	Water	- EP231X PFAS - Full Suite (28 analytes)
041	0229_MW232_210331	Waters WATER	Water	- EP231X PFAS - Full Suite (28 analytes)
042	0229_MW119_210330	Waters WATER	Water	- EP231X PFAS - Full Suite (28 analytes)
043	0229_MW118_210330	Waters WATER	Water	- EP002 Dissolved Organic Carbon (DOC) - EP231X PFAS - Full Suite (28 analytes)
044	0229_MW117S_210330	Waters WATER	Water	- EP231X PFAS - Full Suite (28 analytes)
045	0229_QC302_210330	Waters WATER	Water	- EP231X PFAS - Full Suite (28 analytes)
046	0229_SW220_210401	Waters WATER	Water	- EP231X PFAS - Full Suite (28 analytes)
047	0229_SD220_210401	Sediments SEDIMENT	Soil	- EP231X (solids) PFAS - Full Suite (28 analytes)
048	0229_MW220S_210401	Waters WATER	Water	- EP231X PFAS - Full Suite (28 analytes)



CHAIN OF CUSTODY

COC#: 20924 ALS Laboratory: ET Townsville

RELINQUISHED BY:

RECEIVED BY:

RELINQUISHED BY:

RECEIVED BY:

DATE TIME:

DATE TIME:

DATE TIME:

DATE TIME:

CLIENT: AECOMAU - AECOM Australia Pty Ltd

PROJECT: QLD_0229_PFASOMP_20

SITE: QLD_0229

ORDER NO:

PROJECT MANAGER: [REDACTED]
PRIMARY SAMPLER: [REDACTED]

CONTACT PH: [REDACTED] SAMPLER MOBILE: [REDACTED]
QUOTE NO: TV/007/21 - Compass / ET2021AECOMAU000
1

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

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

Random Sample Temperature on Receipt: C

Other comments:

EMAIL REPORTS TO: [REDACTED]

EMAIL INVOICES TO: [REDACTED]

049	0229_SW134_210401	Waters WATER	Water	- EP231X PFAS - Full Suite (28 analytes)
050	0229_SD134_210401	Waters WATER	Soil	- EP231X PFAS - Full Suite (28 analytes)
051	0229_SW132_210401	Waters WATER	Water	- EP231X PFAS - Full Suite (28 analytes)
052	0229_SD132_210401	Sediments SEDIMENT	Soil	- EP231X (solids) PFAS - Full Suite (28 analytes)
053	0229_QC305_210401	Waters WATER	Water	- EP231X PFAS - Full Suite (28 analytes)
054	0229_MW117D_210330	Waters WATER	Water	- EP231X PFAS - Full Suite (28 analytes)
055	0229_MW124_210331	Waters WATER	Water	- EP231X PFAS - Full Suite (28 analytes)

**CHAIN OF CUSTODY**

COC#: 20924 ALS Laboratory: ET Townsville

RELINQUISHED BY:

RECEIVED BY:

RELINQUISHED BY:

RECEIVED BY:

DATE TIME:

DATE TIME:

DATE TIME:

DATE TIME:

CLIENT: AECOMAU - AECOM Australia Pty Ltd

PROJECT: QLD_0229_PFSOMP_20

SITE: QLD_0229

ORDER NO:

PROJECT MANAGER: [REDACTED]
PRIMARY SAMPLER: [REDACTED]CONTACT PH: [REDACTED] SAMPLER MOBILE: [REDACTED]
QUOTE NO: TV/007/21 - Compass / ET2021AECOMAU000
1

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

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

Random Sample Temperature on Receipt: °C

Other comments:

EMAIL REPORTS TO: [REDACTED]

EMAIL INVOICES TO: [REDACTED]

SAMPLE	SAMPLE NAME	BOTTLE NAME	VOLUME	BARCODE	TYPE	FILTERED	REASON
001	0229_MW002_210331	HDPE (no PTFE)	20 mL	00352010079342	Grey	No	
001	0229_MW002_210331	HDPE (no PTFE)	20 mL	00352010079361	Grey	No	
002	0229_MW114_210331	HDPE (no PTFE)	20 mL	00352010079355	Grey	No	
002	0229_MW114_210331	HDPE (no PTFE)	20 mL	00352010079570	Grey	No	
003	0229_MW139_210331	HDPE (no PTFE)	20 mL	00352010079448	Grey	No	
003	0229_MW139_210331	HDPE (no PTFE)	20 mL	00352010079386	Grey	No	
003	0229_MW139_210331	HDPE (no PTFE)	20 mL	00352010079516	Grey	No	
003	0229_MW139_210331	HDPE (no PTFE)	20 mL	00352010079429	Grey	No	
004	0229_MW120_210331	HDPE (no PTFE)	20 mL	00352010079569	Grey	No	
004	0229_MW120_210331	HDPE (no PTFE)	20 mL	00352010079478	Grey	No	
005	0229_MW106_210331	HDPE (no PTFE)	20 mL	00352010079511	Grey	No	
005	0229_MW106_210331	HDPE (no PTFE)	20 mL	00352010079468	Grey	No	
006	0229_MW072_210331	HDPE (no PTFE)	20 mL	00352010079409	Grey	No	
006	0229_MW072_210331	HDPE (no PTFE)	20 mL	00352010079419	Grey	No	
007	0229_MW138_210331	HDPE (no PTFE)	20 mL	00352010079486	Grey	No	
007	0229_MW138_210331	HDPE (no PTFE)	20 mL	00352010079320	Grey	No	
008	0229_MW131_210331	HDPE (no PTFE)	20 mL	00352010079494	Grey	No	
008	0229_MW131_210331	HDPE (no PTFE)	20 mL	00352010079422	Grey	No	
009	0229_MW128_210331	HDPE (no PTFE)	20 mL	00352010079368	Grey	No	
009	0229_MW128_210331	HDPE (no PTFE)	20 mL	00352010079279	Grey	No	
010	0229_MW101_210331	HDPE (no PTFE)	20 mL	00352010079528	Grey	No	
010	0229_MW101_210331	HDPE (no PTFE)	20 mL	00352010079463	Grey	No	
011	0229_MW105_210331	HDPE (no PTFE)	20 mL	00352010079563	Grey	No	
011	0229_MW105_210331	HDPE (no PTFE)	20 mL	00352010079508	Grey	No	
012	0229_MW115_210331	HDPE (no PTFE)	20 mL	00352010079308	Grey	No	
012	0229_MW115_210331	HDPE (no PTFE)	20 mL	00352010079385	Grey	No	

**CHAIN OF CUSTODY**

COC#: 20924

ALS Laboratory: ET Townsville

RELINQUISHED BY:

RECEIVED BY:

RELINQUISHED BY:

RECEIVED BY:

DATE TIME:

DATE TIME:

DATE TIME:

DATE TIME:

CLIENT: AECOMAU - AECOM Australia Pty Ltd

PROJECT: QLD_0229_PFSOMP_20

SITE: QLD_0229

ORDER NO:

PROJECT MANAGER:

PRIMARY SAMPLER:

EMAIL REPORTS TO:

EMAIL INVOICES TO:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

CONTACT PH:

QUOTE NO: TV/007/21 - Compass

SAMPLER MOBILE:

/ ET2021AECOMAU000
1**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:

013	0229_MW074_210331	HDPE (no PTFE)	20 mL	00352010079350	Grey	No	
013	0229_MW074_210331	HDPE (no PTFE)	20 mL	00352010079382	Grey	No	
014	0229_MW121_210331	HDPE (no PTFE)	20 mL	00352010079334	Grey	No	
014	0229_MW121_210331	HDPE (no PTFE)	20 mL	00352010079325	Grey	No	
015	0229_MW018_210331	HDPE (no PTFE)	20 mL	00352010079405	Grey	No	
015	0229_MW018_210331	HDPE (no PTFE)	20 mL	00352010079377	Grey	No	
016	0229_MW135_210331	HDPE (no PTFE)	20 mL	00352010079489	Grey	No	
016	0229_MW135_210331	HDPE (no PTFE)	20 mL	00352010079300	Grey	No	
017	0229_MW141_210331	HDPE (no PTFE)	20 mL	00352010079437	Grey	No	
017	0229_MW141_210331	HDPE (no PTFE)	20 mL	00352010079335	Grey	No	
017	0229_MW141_210331	HDPE (no PTFE)	20 mL	00352010079310	Grey	No	
017	0229_MW141_210331	HDPE (no PTFE)	20 mL	00352010079337	Grey	No	
018	0229_MW102_210331	HDPE (no PTFE)	20 mL	00352010079481	Grey	No	
018	0229_MW102_210331	HDPE (no PTFE)	20 mL	00352010079483	Grey	No	
018	0229_MW102_210331	HDPE (no PTFE)	20 mL	00352010079289	Grey	No	
018	0229_MW102_210331	HDPE (no PTFE)	20 mL	00352010079454	Grey	No	
019	0229_MW116_210331	HDPE (no PTFE)	20 mL	00352010079319	Grey	No	
019	0229_MW116_210331	HDPE (no PTFE)	20 mL	00352010079418	Grey	No	
019	0229_MW116_210331	HDPE (no PTFE)	20 mL	00352010079575	Grey	No	
019	0229_MW116_210331	HDPE (no PTFE)	20 mL	00352010079372	Grey	No	
020	0229_QC502_210331	HDPE (no PTFE)	20 mL	00352010055395	Grey	No	
020	0229_QC502_210331	HDPE (no PTFE)	20 mL	00352010055419	Grey	No	
021	0229_MW125L_210331	HDPE (no PTFE)	20 mL	00352010079499	Grey	No	
021	0229_MW125L_210331	HDPE (no PTFE)	20 mL	00352010079391	Grey	No	
022	0229_QC108_210331	HDPE (no PTFE)	20 mL	00352010079370	Grey	No	
022	0229_QC108_210331	HDPE (no PTFE)	20 mL	00352010079399	Grey	No	
023	0229_QC109_210331	HDPE (no PTFE)	20 mL	00352010079515	Grey	No	

**CHAIN OF CUSTODY**

COC#: 20924 ALS Laboratory: ET Townsville

RELINQUISHED BY:

RECEIVED BY:

RELINQUISHED BY:

RECEIVED BY:

DATE TIME:

DATE TIME:

DATE TIME:

DATE TIME:

CLIENT: AECOMAU - AECOM Australia Pty Ltd

PROJECT: QLD_0229_PFSOMP_20

SITE: QLD_0229

ORDER NO:

PROJECT MANAGER: [REDACTED]

PRIMARY SAMPLER: [REDACTED]

EMAIL REPORTS TO: [REDACTED]

EMAIL INVOICES TO: [REDACTED]

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

CONTACT PH: SAMPLER MOBILE:
QUOTE NO: TV/007/21 - Compass / ET2021AECOMAU000
1**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:

023	0229_QC109_210331	HDPE (no PTFE)	20 mL	00352010079397	Grey	No	
024	0229_MW003_210331	HDPE (no PTFE)	20 mL	00352010079472	Grey	No	
024	0229_MW003_210331	HDPE (no PTFE)	20 mL	00352010079544	Grey	No	
024	0229_MW003_210331	HDPE (no PTFE)	20 mL	00352010079555	Grey	No	
024	0229_MW003_210331	HDPE (no PTFE)	20 mL	00352010079546	Grey	No	
025	0229_QC106_210331	HDPE (no PTFE)	20 mL	00352010079336	Grey	No	
025	0229_QC106_210331	HDPE (no PTFE)	20 mL	00352010079473	Grey	No	
026	0229_MW212_210331	HDPE (no PTFE)	20 mL	00352010079566	Grey	No	
026	0229_MW212_210331	HDPE (no PTFE)	20 mL	00352010079408	Grey	No	
027	0229_QC303_210331	HDPE (no PTFE)	20 mL	00352010079425	Grey	No	
027	0229_QC303_210331	HDPE (no PTFE)	20 mL	00352010079389	Grey	No	
027	0229_QC303_210331	HDPE (no PTFE)	20 mL	00352010079527	Grey	No	
027	0229_QC303_210331	HDPE (no PTFE)	20 mL	00352010079417	Grey	No	
028	0229_QC301_210329	HDPE (no PTFE)	20 mL	00352010079330	Grey	No	
028	0229_QC301_210329	HDPE (no PTFE)	20 mL	00352010079457	Grey	No	
029	0229_MW125S_210331	HDPE (no PTFE)	20 mL	00352010079295	Grey	No	
029	0229_MW125S_210331	HDPE (no PTFE)	20 mL	00352010079346	Grey	No	
029	0229_MW125S_210331	HDPE (no PTFE)	20 mL	00352010079503	Grey	No	
029	0229_MW125S_210331	HDPE (no PTFE)	20 mL	00352010079374	Grey	No	
030	0229_MW205S_210331	HDPE (no PTFE)	20 mL	00352010079338	Grey	No	
030	0229_MW205S_210331	HDPE (no PTFE)	20 mL	00352010079290	Grey	No	
031	0229_QC107_210331	HDPE (no PTFE)	20 mL	00352010079313	Grey	No	
031	0229_QC107_210331	HDPE (no PTFE)	20 mL	00352010079402	Grey	No	
032	0229_MW065_210331	HDPE (no PTFE)	20 mL	00352010079439	Grey	No	
032	0229_MW065_210331	HDPE (no PTFE)	20 mL	00352010079474	Grey	No	
033	0229_MW233_210331	HDPE (no PTFE)	20 mL	00352010079358	Grey	No	
033	0229_MW233_210331	HDPE (no PTFE)	20 mL	00352010079304	Grey	No	

**CHAIN OF CUSTODY**

COC#: 20924

ALS Laboratory: ET Townsville

RELINQUISHED BY:

RECEIVED BY:

RELINQUISHED BY:

RECEIVED BY:

DATE TIME:

DATE TIME:

DATE TIME:

DATE TIME:

CLIENT: AECOMAU - AECOM Australia Pty Ltd

PROJECT: QLD_0229_PFASOMP_20

SITE: QLD_0229

ORDER NO:

PROJECT MANAGER:

PRIMARY SAMPLER:

EMAIL REPORTS TO:

EMAIL INVOICES TO:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

CONTACT PH:

QUOTE NO: TV/007/21 - Compass

SAMPLER MOBILE:

/ ET2021AECOMAU000

1

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:

034	0229_MW1231_210331	HDPE (no PTFE)	20 mL	00352010079446	Grey	No	
034	0229_MW1231_210331	HDPE (no PTFE)	20 mL	00352010079423	Grey	No	
035	0229_QC304_210331	HDPE (no PTFE)	20 mL	00352010079509	Grey	No	
035	0229_QC304_210331	HDPE (no PTFE)	20 mL	00352010079565	Grey	No	
036	0229_MW236S_210331	HDPE (no PTFE)	20 mL	00352010079484	Grey	No	
036	0229_MW236S_210331	HDPE (no PTFE)	20 mL	00352010079533	Grey	No	
036	0229_MW236S_210331	HDPE (no PTFE)	20 mL	00352010079323	Grey	No	
036	0229_MW236S_210331	HDPE (no PTFE)	20 mL	00352010079411	Grey	No	
037	0229_MW123S_210331	HDPE (no PTFE)	20 mL	00352010079475	Grey	No	
037	0229_MW123S_210331	HDPE (no PTFE)	20 mL	00352010079427	Grey	No	
038	0229_MW122_210331	HDPE (no PTFE)	20 mL	00352010079353	Grey	No	
038	0229_MW122_210331	HDPE (no PTFE)	20 mL	00352010079466	Grey	No	
039	0229_MW217_210331	HDPE (no PTFE)	20 mL	00352010079535	Grey	No	
039	0229_MW217_210331	HDPE (no PTFE)	20 mL	00352010079311	Grey	No	
040	0229_MW225S_210331	HDPE (no PTFE)	20 mL	00352010079365	Grey	No	
040	0229_MW225S_210331	HDPE (no PTFE)	20 mL	00352010079407	Grey	No	
040	0229_MW225S_210331	HDPE (no PTFE)	20 mL	00352010079291	Grey	No	
040	0229_MW225S_210331	HDPE (no PTFE)	20 mL	00352010079497	Grey	No	
041	0229_MW232_210331	HDPE (no PTFE)	20 mL	00352010079436	Grey	No	
041	0229_MW232_210331	HDPE (no PTFE)	20 mL	00352010079449	Grey	No	
041	0229_MW232_210331	HDPE (no PTFE)	20 mL	00352010079431	Grey	No	
041	0229_MW232_210331	HDPE (no PTFE)	20 mL	00352010079496	Grey	No	
042	0229_MW119_210330	HDPE (no PTFE)	20 mL	00352010079443	Grey	No	
042	0229_MW119_210330	HDPE (no PTFE)	20 mL	00352010079414	Grey	No	
043	0229_MW118_210330	HDPE (no PTFE)	20 mL	00352010079438	Grey	No	
043	0229_MW118_210330	HDPE (no PTFE)	20 mL	00352010079322	Grey	No	
044	0229_MW117S_210330	HDPE (no PTFE)	20 mL	00352010079561	Grey	No	

**CHAIN OF CUSTODY**

COCH#: 20924 ALS Laboratory: ET Townsville

RELINQUISHED BY:

RECEIVED BY:

RELINQUISHED BY:

RECEIVED BY:

DATE TIME:

DATE TIME:

DATE TIME:

DATE TIME:

CLIENT: AECOMAU - AECOM Australia Pty Ltd

PROJECT: QLD_0229_PFSOMP_20

SITE: QLD_0229

ORDER NO:

PROJECT MANAGER:

PRIMARY SAMPLER:

EMAIL REPORTS TO:

EMAIL INVOICES TO:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

CONTACT PH:

QUOTE NO: TV/007/21 - Compass

SAMPLER MOBILE:

/ ET2021AECOMAU000

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:

044	0229_MW117S_210330	HDPE (no PTFE)	20 mL	00352010079464	Grey	No	
044	0229_MW117S_210330	HDPE (no PTFE)	20 mL	00352010079450	Grey	No	
044	0229_MW117S_210330	HDPE (no PTFE)	20 mL	00352010079415	Grey	No	
045	0229_QC302_210330	HDPE (no PTFE)	20 mL	00352010079458	Grey	No	
045	0229_QC302_210330	HDPE (no PTFE)	20 mL	00352010079324	Grey	No	
046	0229_SW220_210401	HDPE (no PTFE)	20 mL	00350719028199	Grey	No	
046	0229_SW220_210401	HDPE (no PTFE)	20 mL	00350719028258	Grey	No	
047	0229_SD220_210401	HDPE Soil Jar	200 mL	00620719071665	Grey	No	
048	0229_MW220S_210401	HDPE (no PTFE)	20 mL	00352010079362	Grey	No	
048	0229_MW220S_210401	HDPE (no PTFE)	20 mL	00352010079406	Grey	No	
049	0229_SW134_210401	HDPE (no PTFE)	20 mL	00350719028074	Grey	No	
049	0229_SW134_210401	HDPE (no PTFE)	20 mL	00350719028240	Grey	No	
050	0229_SD134_210401	HDPE Soil Jar	200 mL	00620719071644	Grey	No	
051	0229_SW132_210401	HDPE (no PTFE)	20 mL	00351219044468	Grey	No	
051	0229_SW132_210401	HDPE (no PTFE)	20 mL	00351219044425	Grey	No	
052	0229_SD132_210401	HDPE Soil Jar	200 mL	00620719071667	Grey	No	
053	0229_QC305_210401	HDPE (no PTFE)	20 mL	00352010079306	Grey	No	
053	0229_QC305_210401	HDPE (no PTFE)	20 mL	00352010079455	Grey	No	
054	0229_MW117D_210330	HDPE (no PTFE)	20 mL	00352010079339	Grey	No	
054	0229_MW117D_210330	HDPE (no PTFE)	20 mL	00352010079426	Grey	No	
055	0229_MW124_210331	HDPE (no PTFE)	20 mL	00352010079521	Grey	No	
055	0229_MW124_210331	HDPE (no PTFE)	20 mL	00352010079343	Grey	No	

Total Bottle Count: ALS: 129, Non ALS: 0



Environmental Division
Townsville
Work Order Reference
ET2101594



Telephone : +61 7 4773 0000

Custody Document for Submissions via ALS Compass App

Project: QLD_0229_PFASOMP_20 Client: AELom

Project Manager:

Phone:

ALS Compass COC Reference: 20928 # Samples: 1

Sampler:

Phone:

Turnaround Requirements: Standard Urgent

Special Instructions:

Please double check date - should be as per sample IDs

Custody:

Relinquished by:	Received by:	Relinquished by:	Received by:
Date / Time:	Date / Time: <u>1/4/21 1155'</u>	Date / Time:	Date / Time:

**CHAIN OF CUSTODY**

ALS COC#: 20928

ALS Laboratory: ET Townsville

RELINQUISHED BY:

RECEIVED BY:

RELINQUISHED BY:

RECEIVED BY:

DATE TIME:

DATE TIME:

DATE TIME:

DATE TIME:

CLIENT: AECOMAU - AECOM Australia Pty Ltd

PROJECT: QLD_0229_PFASOMP_20

SITE: QLD_0229

ORDER NO:

PROJECT MANAGER:

PRIMARY SAMPLER:

EMAIL REPORTS TO:

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:

CONTACT PH:

SAMPLER MOBILE:

QUOTE NO: TV/007/21 - Compass

/ ET2021AECOMAU000

1

SAMPLE DETAILS**ANALYSIS REQUIRED**

SAMPLE	NAME	DESCRIPTION	DATE / TIME	MATRIX	TOTAL BOTTLES	ON HOLD	Waters WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
001	0229_MW226_210330		01/04/2021 07:47 AM	Water	ALS: 2 Non ALS: 0	No	Partial 1/4		

**CHAIN OF CUSTODY**

COC#: 20928 ALS Laboratory: ET Townsville

RELINQUISHED BY:

RECEIVED BY:

RELINQUISHED BY:

RECEIVED BY:

DATE TIME:

DATE TIME:

DATE TIME:

DATE TIME:

CLIENT: AECOMAU - AECOM Australia Pty Ltd

PROJECT: QLD_0229_PFASOMP_20

SITE: QLD_0229

ORDER NO:

PROJECT MANAGER: [REDACTED]

PRIMARY SAMPLER: [REDACTED]

EMAIL REPORTS TO: [REDACTED]

EMAIL INVOICES TO: [REDACTED]

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

CONTACT PH: SAMPLER MOBILE:
QUOTE NO: TV/007/21 - Compass / ET2021AECOMAU000
1**LABORATORY USE ONLY (Circle)**

Custody Seal intact? Yes No N/A

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

Random Sample Temperature on Receipt: C

Other comments:

SAMPLE	SAMPLE NAME	PARTIAL ANALYSIS GROUP NAME	MATRIX	SELECTED ANALYSIS NAME
001	0229_MW226_210330	Waters WATER	Water	- EP231X PFAS - Full Suite (28 analytes)

**CHAIN OF CUSTODY**

COC#: 20928 ALS Laboratory: ET Townsville

RELINQUISHED BY:

RECEIVED BY:

RELINQUISHED BY:

RECEIVED BY:

DATE TIME:

DATE TIME:

DATE TIME:

DATE TIME:

CLIENT: AECOMAU - AECOM Australia Pty Ltd

PROJECT: QLD_0229_PFASOMP_20

SITE: QLD_0229

ORDER NO:

PROJECT MANAGER: [REDACTED]

PRIMARY SAMPLER: [REDACTED]

EMAIL REPORTS TO: [REDACTED]

EMAIL INVOICES TO: [REDACTED]

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

CONTACT PH: SAMPLER MOBILE:
QUOTE NO: TV/007/21 - Compass / ET2021AECOMAU000
1**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	0229_MW226_210330	HDPE (no PTFE)	20 mL	00352010079354	Grey	No	
001	0229_MW226_210330	HDPE (no PTFE)	20 mL	00352010079520	Grey	No	

Total Bottle Count: ALS: 2, Non ALS: 0



ALS Compass

SAMPLING *Intelligence*



Environmental Division
Townsville
Work Order Reference
ET2101595



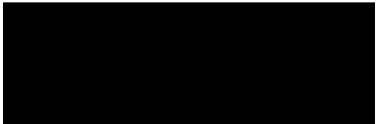
Telephone : + 61 7 4773 0000

Custody Document for Submissions via ALS Compass App

Project: QLD-0229-PFASOMP-20 Client: AELOM Project Manager: _____
 Phone: _____
 ALS Compass COC Reference: 20929 # Samples: 4 Sampler: _____
 Phone: _____
 Turnaround Requirements: Standard _____ Urgent _____

Special Instructions:

Custody:

<p>Relinquished by:</p> <p>Date / Time:</p>	<p>Received by:</p>  <p>Date / Time:</p> <p>1/4/21 11:55</p>	<p>Relinquished by:</p> <p>Date / Time:</p>	<p>Received by:</p> <p>Date / Time:</p>
--	---	--	--

**CHAIN OF CUSTODY**

COC#: 20929

ALS Laboratory: ET Townsville

RELINQUISHED BY:

RECEIVED BY:

RELINQUISHED BY:

RECEIVED BY:

DATE TIME:

DATE TIME:

DATE TIME:

DATE TIME:

CLIENT: AECOMAU - AECOM Australia Pty Ltd

PROJECT: QLD_0229_PFSOMP_20

SITE: QLD_0229

ORDER NO:

PROJECT MANAGER:

PRIMARY SAMPLER:

EMAIL REPORTS TO:

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:

CONTACT PH:

SAMPLER MOBILE:

QUOTE NO: TV/007/21 - Compass

/ ET2021AECOMAU000
1**SAMPLE DETAILS****ANALYSIS REQUIRED**

SAMPLE	NAME	DESCRIPTION	DATE / TIME	MATRIX	TOTAL BOTTLES	ON HOLD	ANALYSIS REQUIRED			ADDITIONAL INFORMATION
							Sediments SEDIMENT	Waters WATER	ALTERNATIVE ANALYSIS	
001	0229_SW212_210401		01/04/2021 08:40 AM	Water	ALS: 4 Non ALS: 0	No		Partial 1/4		
002	0229_SD212_210401		01/04/2021 08:41 AM	Soil	ALS: 1 Non ALS: 0	No	Partial 1/4			
003	0229_SD211_210401		01/04/2021 08:59 AM	Soil	ALS: 1 Non ALS: 0	No	Partial 1/4			
004	0229_SW211_210401		01/04/2021 09:01 AM	Water	ALS: 4 Non ALS: 0	No		Partial 1/4		

**CHAIN OF CUSTODY**

COC#: 20929

ALS Laboratory: ET Townsville

RELINQUISHED BY:

RECEIVED BY:

RELINQUISHED BY:

RECEIVED BY:

DATE TIME:

DATE TIME:

DATE TIME:

DATE TIME:

CLIENT: AECOMAU - AECOM Australia Pty Ltd

PROJECT: QLD_0229_PFASOMP_20

SITE: QLD_0229

ORDER NO:

PROJECT MANAGER:

PRIMARY SAMPLER:

EMAIL REPORTS TO:

EMAIL INVOICES TO:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

CONTACT PH:

QUOTE NO: TV/007/21 - Compass

SAMPLER MOBILE:

/ ET2021AECOMAU000

1

LABORATORY USE ONLY (Circle)

Custody Seal intact?

Yes No N/A

Free ice / frozen ice bricks present upon receipt?

Yes No N/A

Random Sample Temperature on Receipt:

°C

Other comments:

SAMPLE	SAMPLE NAME	PARTIAL ANALYSIS GROUP NAME	MATRIX	SELECTED ANALYSIS NAME
001	0229_SW212_210401	Waters WATER	Water	- EP231X PFAS - Full Suite (28 analytes)
002	0229_SD212_210401	Sediments SEDIMENT	Soil	- EP231X (solids) PFAS - Full Suite (28 analytes)
003	0229_SD211_210401	Sediments SEDIMENT	Soil	- EP231X (solids) PFAS - Full Suite (28 analytes)
004	0229_SW211_210401	Waters WATER	Water	- EP231X PFAS - Full Suite (28 analytes)

**CHAIN OF CUSTODY**

COC#: 20929

ALS Laboratory: ET Townsville

RELINQUISHED BY:

RECEIVED BY:

RELINQUISHED BY:

RECEIVED BY:

DATE TIME:

DATE TIME:

DATE TIME:

DATE TIME:

CLIENT: AECOMAU - AECOM Australia Pty Ltd

PROJECT: QLD_0229_PFSOMP_20

SITE: QLD_0229

ORDER NO:

PROJECT MANAGER:

PRIMARY SAMPLER:

EMAIL REPORTS TO:

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:

CONTACT PH:

SAMPLER MOBILE:

QUOTE NO: TV/007/21 - Compass

/ ET2021AECOMAU000


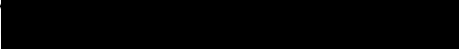
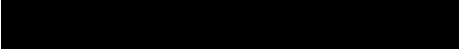
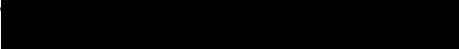
1

SAMPLE	SAMPLE NAME	BOTTLE NAME	VOLUME	BARCODE	TYPE	FILTERED	REASON
001	0229_SW212_210401	HDPE (no PTFE)	20 mL	00352010079557	Grey	No	
001	0229_SW212_210401	HDPE (no PTFE)	20 mL	00352010079383	Grey	No	
001	0229_SW212_210401	HDPE (no PTFE)	20 mL	00352010079524	Grey	No	
001	0229_SW212_210401	HDPE (no PTFE)	20 mL	00352010079328	Grey	No	
002	0229_SD212_210401	HDPE Soil Jar	200 mL	00620719071618	Grey	No	
003	0229_SD211_210401	HDPE Soil Jar	200 mL	00620719071690	Grey	No	
004	0229_SW211_210401	HDPE (no PTFE)	20 mL	00352010079345	Grey	No	
004	0229_SW211_210401	HDPE (no PTFE)	20 mL	00352010079432	Grey	No	
004	0229_SW211_210401	HDPE (no PTFE)	20 mL	00352010079331	Grey	No	
004	0229_SW211_210401	HDPE (no PTFE)	20 mL	00352010079531	Grey	No	



Total Bottle Count: ALS: 10, Non ALS: 0



Custody Document for Submissions via ALS Compass App

Project: 60612487-3.1 Client: AECOM Project Manager: 
 ALS Compass COC Reference: 22730 # Samples: 4 Sampler: 
 Turnaround Requirements: Standard Urgent Phone: 
 Phone: 

Special Instructions:

Custody:			
Relinquished by: 	Received by: 	Relinquished by:	Received by:
Date / Time: <u>17/5/21</u> <u>17:17</u>	Date / Time: <u>17/5/21</u> <u>17:17</u>	Date / Time:	Date / Time:

**CHAIN OF CUSTODY**

COC#: 22730 ALS Laboratory: ET Townsville

RELINQUISHED BY:

RECEIVED BY:

RELINQUISHED BY:

RECEIVED BY:

DATE TIME:

DATE TIME:

DATE TIME:

DATE TIME:

CLIENT: AECOMAU - AECOM Australia Pty Ltd

PROJECT: QLD_0229_PFASOMP_20

SITE: QLD_0229

ORDER NO:

PROJECT MANAGER: [REDACTED]

PRIMARY SAMPLER: [REDACTED]

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:

CONTACT PH: SAMPLER MOBILE:
QUOTE NO: TV/007/21 - Compass / ET2021AECOMAU000
1

SAMPLE DETAILS							ANALYSIS REQUIRED			
SAMPLE	NAME	DESCRIPTION	DATE / TIME	MATRIX	TOTAL BOTTLES	ON HOLD	Sediments SEDIMENT	Waters WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
001	0229_SW144_210513		13/05/2021 12:11 PM	Water	ALS: 4 Non ALS: 0	No		Partial 1/4		
002	0229_SD144_210513		13/05/2021 12:11 PM	Soil	ALS: 1 Non ALS: 0	No	Partial 1/4			
003	0229_QC306_210513		13/05/2021 12:12 PM	Water	ALS: 2 Non ALS: 0	No		Partial 1/4		
004	0229_QC503_210513		13/05/2021 12:12 PM	Water	ALS: 2 Non ALS: 0	No		Partial 1/4		

**CHAIN OF CUSTODY**

COC#: 22730 ALS Laboratory: ET Townsville

RELINQUISHED BY:

RECEIVED BY:

RELINQUISHED BY:

RECEIVED BY:

DATE TIME:

DATE TIME:

DATE TIME:

DATE TIME:

CLIENT: AECOMAU - AECOM Australia Pty Ltd

PROJECT: QLD_0229_PFASOMP_20

SITE: QLD_0229

ORDER NO:

PROJECT MANAGER: [REDACTED]
PRIMARY SAMPLER: [REDACTED]CONTACT PH: [REDACTED] SAMPLER MOBILE: [REDACTED]
QUOTE NO: TV/007/21 - Compass / ET2021AECOMAU000
1

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
001	0229_SW144_210513	Waters WATER	Water	- EP231X PFAS - Full Suite (28 analytes)
002	0229_SD144_210513	Sediments SEDIMENT	Soil	- EP231X (solids) PFAS - Full Suite (28 analytes)
003	0229_QC306_210513	Waters WATER	Water	- EP231X PFAS - Full Suite (28 analytes)
004	0229_QC503_210513	Waters WATER	Water	- EP231X PFAS - Full Suite (28 analytes)

**CHAIN OF CUSTODY**

COC#: 22730 ALS Laboratory: ET Townsville

RELINQUISHED BY:

RECEIVED BY:

RELINQUISHED BY:

RECEIVED BY:

DATE TIME:

DATE TIME:

DATE TIME:

DATE TIME:

CLIENT: AECOMAU - AECOM Australia Pty Ltd

PROJECT: QLD_0229_PFSOMP_20

SITE: QLD_0229

ORDER NO:

PROJECT MANAGER: [REDACTED]

PRIMARY SAMPLER: [REDACTED]

EMAIL REPORTS TO: [REDACTED]

EMAIL INVOICES TO: [REDACTED]

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

CONTACT PH: SAMPLER MOBILE:
QUOTE NO: TV/007/21 - Compass / ET2021AECOMAU000
1**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	0229_SW144_210513	HDPE (no PTFE)	20 mL	00350019013904	Grey	No	
001	0229_SW144_210513	HDPE (no PTFE)	20 mL	00352010079376	Grey	No	
001	0229_SW144_210513	HDPE (no PTFE)	20 mL	00352010079477	Grey	No	
001	0229_SW144_210513	HDPE (no PTFE)	20 mL	00350019036405	Grey	No	
002	0229_SD144_210513	HDPE Soil Jar	200 mL	00620219019706	Grey	No	
003	0229_QC306_210513	HDPE (no PTFE)	20 mL	00352010079487	Grey	No	
003	0229_QC306_210513	HDPE (no PTFE)	20 mL	00352010079321	Grey	No	
004	0229_QC503_210513	HDPE (no PTFE)	20 mL	00352010055274	Grey	No	
004	0229_QC503_210513	HDPE (no PTFE)	20 mL	00352010034685	Grey	No	

Total Bottle Count: ALS: 9, Non ALS: 0

due 14/4/21 ✓
AEC006/210407 *Am*

CHAIN OF CUSTODY DOCUMENTATION

CLIENT: AECOM Australia	SAMPLER: [REDACTED]
ADDRESS / OFFICE: [REDACTED]	MOBILE: [REDACTED]
PROJECT MANAGER (PM): [REDACTED]	PHONE: [REDACTED]
PROJECT ID: QLD_0229_PFSOMP_20	EMAIL REPORT TO: [REDACTED]
SITE: QLD_0229 P.O. NO.: 60612487_3.1	EMAIL INVOICE TO: (if different to report) [REDACTED]

NMI

RESULTS REQUIRED (Date): Standard TAT	QUOTE NO.:	ANALYSIS REQUIRED including SUITES (note - suite codes must be listed to attract suite prices)
FOR LABORATORY USE ONLY COOLER SEAL (circle appropriate) Intact: Yes No N/A SAMPLE TEMPERATURE CHILLED: Yes No		COMMENTS / SPECIAL HANDLING / STORAGE OR DISPOSAL Notes: e.g. Highly contaminated samples e.g. "High PAHs expected". Extra volume for QC or trace LORs etc.
SAMPLE INFORMATION (note: S = Soil, W=Water) CONTAINER INFORMATION		

ALS ID	SAMPLE ID	MATRIX	DATE	Time	Type / Code	Total bottles	WATER - PFAS Standard 28 analyses	SOIL - PFAS Standard 28 analyses	Barcode 1	Barcode 2	HOLD
	0229_QC200_210326	S	26/03/21		1 x P	2		x	N21/008900		
	0229_QC201_210326	W	26/03/21		2 x P	2	x		N21/008901		
	0229_QC202_210329	W	29/03/21		2 x P	2	x		N21/008902		
	0229_QC203_210329	S	29/03/21		1 x P	1		x	N21/008903		
	0229_QC204_210329	W	29/03/21		2 x P	2	x		N21/008904		
	0229_QC205_210329	S	29/03/21		1 x P	1		x	N21/008905		
	0229_QC206_210331	W	31/03/21		2 x P	2	x		N21/008906		
	0229_QC207_210331	W	31/03/21		2 x P	2	x		N21/008907		
	0229_QC208_210331	W	31/03/21		2 x P	2	x		N21/008908		
	0229_QC209_210331	W	31/03/21		2 x P	2	x		N21/008909		

RECEIVED
07 APR 2021
BY: [REDACTED] 00

RELINQUISHED BY:		RECEIVED BY:		METHOD OF SHIPMENT:
Name: Lucy Muir	[REDACTED]	Name:	[REDACTED]	Con' Note No:
Of: AECOM	Time: 14:00	Of:	[REDACTED]	Transport Co:
Name:	Date: 06/04/2021	Name:	[REDACTED]	
Of:	Time:	Of:	[REDACTED]	

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




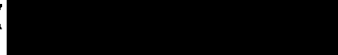
Environmental Division
Townsville
Work Order Reference
ET2102888

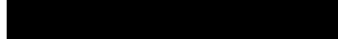
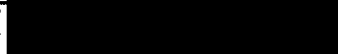


Telephone : + 61 7 4773 0000



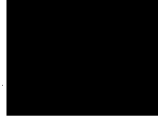
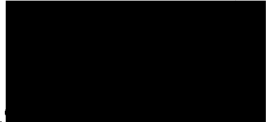
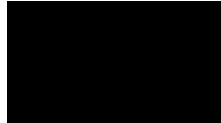
Custody Document for Submissions via ALS Compass App

Project: QLD_0229_PPASOMP_20 Client: AELOM Project Manager: 

ALS Compass COC Reference: 24466 # Samples: 6 Phone: ()

Turnaround Requirements: Standard Urgent _____
 Sampler:  Phone: ()

Special Instructions:

Custody:			
Relinquished by: 	Received by: 	Relinquished by: 	Received by: 
Date / Time: <u>22/6/21</u> <u>1500</u>	Date / Time: <u>22/6/21</u> <u>15:00</u>	Date / Time:  <u>22/6/21</u>	Date / Time: <u>23-6-21 08:45</u>

**CHAIN OF CUSTODY**

COC#: 24466 ALS Laboratory: ET Townsville

RELINQUISHED BY:
 DATE TIME:

RECEIVED BY:
 DATE TIME:

RELINQUISHED BY:
 DATE TIME:

RECEIVED BY:
 DATE TIME:

 CLIENT: AECOMAU - AECOM Australia Pty Ltd
 PROJECT: QLD_0229_PFSOMP_20
 SITE: 0229
 ORDER NO:
 PROJECT MANAGER: [REDACTED]
 PRIMARY SAMPLER: [REDACTED]
 EMAIL REPORTS TO: [REDACTED]
 EMAIL INVOICES TO: [REDACTED]

 TURNAROUND REQUIREMENTS : 0 Days
 Biohazard info:
 CONTACT PH: SAMPLER MOBILE:
 QUOTE NO: TV/007/21 - Compass / ET2021AECOMAU0001

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	Analysis NOT REQUIRED	Waters WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
001	0229_SW135_220621		22/06/2021 01:36 PM	Water	ALS: 2 Non ALS: 0	No		Partial 1/4		
002	0229_QC100_220621		22/06/2021 01:36 PM	Water	ALS: 2 Non ALS: 0	No		Partial 1/4		
003	0229_QC500_220621		22/06/2021 01:35 PM	Water	ALS: 2 Non ALS: 0	No				
004	0229_SW139_220621		22/06/2021 02:02 PM	Water	ALS: 4 Non ALS: 0	No		Partial 1/4		
005	0229_QC300_220621		22/06/2021 02:31 PM	Water	ALS: 2 Non ALS: 0	No		Partial 1/4		
006	0229_QC400_220621		22/06/2021 02:31 PM	Water	ALS: 2 Non ALS: 0	No		Partial 1/4		

**CHAIN OF CUSTODY**

COC#: 24466 ALS Laboratory: ET Townsville

RELINQUISHED BY:
DATE TIME:RECEIVED BY:
DATE TIME:RELINQUISHED BY:
DATE TIME:RECEIVED BY:
DATE TIME:CLIENT: AECOMAU - AECOM Australia Pty Ltd
PROJECT: QLD_0229_PFASOMP_20
SITE: 0229
ORDER NO:TURNAROUND REQUIREMENTS : 0 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: SAMPLER MOBILE:
QUOTE NO: TV/007/21 - Compass / ET2021AECOMAU000
1

EMAIL REPORTS TO: [REDACTED]

EMAIL INVOICES TO: [REDACTED]

SAMPLE	SAMPLE NAME	PARTIAL ANALYSIS GROUP NAME	MATRIX	SELECTED ANALYSIS NAME
001	0229_SW135_220621	Waters WATER	Water	- EP231X PFAS - Full Suite (28 analytes)
002	0229_QC100_220621	Waters WATER	Water	- EP231X PFAS - Full Suite (28 analytes)
004	0229_SW139_220621	Waters WATER	Water	- EP231X PFAS - Full Suite (28 analytes)
005	0229_QC300_220621	Waters WATER	Water	- EP231X PFAS - Full Suite (28 analytes)
006	0229_QC400_220621	Waters WATER	Water	- EP231X PFAS - Full Suite (28 analytes)

**CHAIN OF CUSTODY**

COC#: 24466 ALS Laboratory: ET Townsville

RELINQUISHED BY:
 DATE TIME:

RECEIVED BY:
 DATE TIME:

RELINQUISHED BY:
 DATE TIME:

RECEIVED BY:
 DATE TIME:

 CLIENT: AECOMAU - AECOM Australia Pty Ltd
 PROJECT: QLD_0229_PFASOMP_20
 SITE: 0229
 ORDER NO:

 TURNAROUND REQUIREMENTS : 0 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:
 PRIMARY SAMPLER:

 CONTACT PH: SAMPLER MOBILE:
 QUOTE NO: TV/007/21 - Compass / ET2021AECOMAU000
 1

EMAIL REPORTS TO:

EMAIL INVOICES TO:

SAMPLE	SAMPLE NAME	BOTTLE NAME	VOLUME	BARCODE	TYPE	FILTERED	REASON
001	0229_SW135_220621	HDPE (no PTFE)	20 mL	00350019152588	Grey	No	
001	0229_SW135_220621	HDPE (no PTFE)	20 mL	00350019152674	Grey	No	
002	0229_QC100_220621	HDPE (no PTFE)	20 mL	00350019152656	Grey	No	
002	0229_QC100_220621	HDPE (no PTFE)	20 mL	00350019152697	Grey	No	
003	0229_QC500_220621	HDPE (no PTFE)	20 mL	00352010010161	Grey	No	
003	0229_QC500_220621	HDPE (no PTFE)	20 mL	00352010034513	Grey	No	
004	0229_SW139_220621	HDPE (no PTFE)	20 mL	00351219044485	Grey	No	
004	0229_SW139_220621	HDPE (no PTFE)	20 mL	00350719028208	Grey	No	
004	0229_SW139_220621	HDPE (no PTFE)	20 mL	00350719028108	Grey	No	
004	0229_SW139_220621	HDPE (no PTFE)	20 mL	00351219044491	Grey	No	
005	0229_QC300_220621	HDPE (no PTFE)	20 mL	00352010057953	Grey	No	
005	0229_QC300_220621	HDPE (no PTFE)	20 mL	00352010057906	Grey	No	
006	0229_QC400_220621	HDPE (no PTFE)	20 mL	00352010057869	Grey	No	
006	0229_QC400_220621	HDPE (no PTFE)	20 mL	00350019152594	Grey	No	

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

CHAIN OF CUSTODY

ALS Laboratory: please tick →

AEC006/210624
DUE: 01/07/21

CLIENT: AECOM		TURNAROUND REQUIREMENTS : <input checked="" type="checkbox"/> Standard TAT (List due date):		FOR LABORATORY USE ONLY (Circle)	
OFFICE: TOWNSVILLE		(Standard TAT may be longer for some tests e.g. Ultra Trace Organics)		Custody Seal Intact? Yes No N/A	
PROJECT: QLD-0229-PFASOMP-20		PROJECT NO.:		Free ice / frozen ice bricks present upon receipt? Yes No N/A	
ORDER NUMBER: 60612487-31		PURCHASE ORDER NO.:		Random Sample Temperature on Receipt: °C	
PROJECT MANAGER:		CONTACT PH:		Other comment:	
SAMPLER:		SAMPLER MOBILE:		RECEIVED BY:	
COC Emailed to ALS? (YES / NO)		EDD FORMAT (or default):		RELINQUISHED BY:	
Email Reports to (will default to PM if no other addresses are listed):		DATE/TIME: 22/6/21 1700		DATE/TIME:	
Email Invoice to (will default to PM if no other addresses are listed):		RECEIVED BY:		DATE/TIME:	
COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL:		RECEIVED BY:		DATE/TIME:	

SAMPLE DETAILS MATRIX: Solid(S) Water(W)		CONTAINER INFORMATION		ANALYSIS REQUIRED including SUITES (NB. Suite Codes must be listed to attract suite price) Where Metals are required, specify Total (unfiltered bottle required) or Dissolved (field filtered bottle required).						Additional Information	
LAB ID	SAMPLE ID	DATE / TIME	MATRIX	TYPE & PRESERVATIVE (refer to codes below)	TOTAL BOTTLES						Comments on likely contaminant levels, dilutions, or samples requiring specific QC analysis etc.
	0229-QLD-220621	22/6/21 1330	W	1x ORC P	1	X					
	* QC 200 - ON LABEL										
					TOTAL	1	1				

N21/075896

PFAS - 28 analytes standard LOR

RECEIVED
24 JUN 2021
BY: [Signature]

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

Appendix E

Analytical Laboratory
Reports



CERTIFICATE OF ANALYSIS

Work Order : ET2101548
Amendment : 1
Client : AECOM Australia Pty Ltd
Contact : [Redacted]
Address : [Redacted]
Telephone : [Redacted]
Project : QLD_0229_PFASOMP_20
Order number : -
C-O-C number : 20735
Sampler : [Redacted]
Site : QLD_0229
Quote number : TV/007/21 - Compass
No. of samples received : 20
No. of samples analysed : 20

Page : 1 of 13
Laboratory : Environmental Division Townsville
Contact : [Redacted]
Address : [Redacted]
Telephone : [Redacted]
Date Samples Received : 26-Mar-2021 16:45
Date Analysis Commenced : 31-Mar-2021
Issue Date : 08-Apr-2021 09:00



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.

Table with 3 columns: Signatories, Position, Accreditation Category. All content is redacted.



General Comments

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

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

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

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

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

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contact 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 PFAS: The LOR of particular analytes for samples '0229_SD130_210326' and '0229_SD128_210326' have been raised due to matrix interference.
- 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.
- **Amendment (8/04/2021): This report has been amended as a result of a request to change sample identification (IDs) received from [REDACTED] on 7.4.21, for samples #1 and s#17. All analysis results are as per the previous report.**
- All analysis will be conducted by ALS Environmental, Brisbane, NATA accreditation no. 825, Site No. 818.
- 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.
- 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	0229_QC100_210326	0229_SD244_210326	0229_SD245_210326	0229_SD227_210326	0229_SD136_210326
Sampling date / time				26-Mar-2021 11:16	26-Mar-2021 11:19	26-Mar-2021 11:20	26-Mar-2021 11:23	26-Mar-2021 13:40	
Compound	CAS Number	LOR	Unit	ET2101548-003	ET2101548-004	ET2101548-005	ET2101548-007	ET2101548-011	
				Result	Result	Result	Result	Result	
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content	----	0.1	%	16.7	16.6	30.5	34.2	40.3	
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	0.0008	
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	0.0051	
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	0.0005	
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	
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	



Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)				Sample ID	0229_QC100_210326	0229_SD244_210326	0229_SD245_210326	0229_SD227_210326	0229_SD136_210326
Sampling date / time				26-Mar-2021 11:16	26-Mar-2021 11:19	26-Mar-2021 11:20	26-Mar-2021 11:23	26-Mar-2021 13:40	
Compound	CAS Number	LOR	Unit	ET2101548-003	ET2101548-004	ET2101548-005	ET2101548-007	ET2101548-011	
				Result	Result	Result	Result	Result	
EP231C: Perfluoroalkyl Sulfonamides - Continued									
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	0.0064	
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	0.0059	
Sum of PFAS (WA DER List)	----	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	0.0064	
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.0002	%	110	115	108	87.5	104	
13C8-PFOA	----	0.0002	%	104	102	104	100	102	



Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)				Sample ID	0229_SD130_210326	0229_SD129_210326	0229_SD128_210326	0229_SD126_210326	----
Sampling date / time				26-Mar-2021 13:58	26-Mar-2021 14:11	26-Mar-2021 14:23	26-Mar-2021 15:34	----	----
Compound	CAS Number	LOR	Unit	ET2101548-013	ET2101548-014	ET2101548-016	ET2101548-019	-----	----
				Result	Result	Result	Result	----	----
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content	----	0.1	%	44.4	22.9	28.6	26.8	----	----
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	0.0012	<0.0002	0.0004	<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	0.0083	0.0005	0.0040	0.0003	----	----
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	<0.0002	0.0010	<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	<0.0008	<0.0002	<0.0006	<0.0002	----	----
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0004	<0.0002	<0.0003	<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	----	----
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	<0.0005	----	----



Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)				Sample ID	0229_SD130_210326	0229_SD129_210326	0229_SD128_210326	0229_SD126_210326	----
Sampling date / time				26-Mar-2021 13:58	26-Mar-2021 14:11	26-Mar-2021 14:23	26-Mar-2021 15:34	----	----
Compound	CAS Number	LOR	Unit	ET2101548-013	ET2101548-014	ET2101548-016	ET2101548-019	-----	----
				Result	Result	Result	Result	----	----
EP231C: Perfluoroalkyl Sulfonamides - Continued									
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	<0.0003	<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	0.0095	0.0005	0.0054	0.0003	----	----
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg	0.0095	0.0005	0.0044	0.0003	----	----
Sum of PFAS (WA DER List)	----	0.0002	mg/kg	0.0095	0.0005	0.0044	0.0003	----	----
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.0002	%	108	104	105	104	----	----
13C8-PFOA	----	0.0002	%	108	105	104	110	----	----



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	0229_SW227_210326	0229_SW244_210326	0229_SW245_210326	0229_QC101_210326	0229_QC500_210326
Sampling date / time				26-Mar-2021 11:11	26-Mar-2021 09:00	26-Mar-2021 11:22	26-Mar-2021 11:24	26-Mar-2021 11:26	
Compound	CAS Number	LOR	Unit	ET2101548-001	ET2101548-002	ET2101548-006	ET2101548-008	ET2101548-009	
				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	0.02	µg/L	<0.02	<0.02	<0.02	<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	<0.01	<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	
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05	



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	0229_SW227_210326	0229_SW244_210326	0229_SW245_210326	0229_QC101_210326	0229_QC500_210326
Sampling date / time					26-Mar-2021 11:11	26-Mar-2021 09:00	26-Mar-2021 11:22	26-Mar-2021 11:24	26-Mar-2021 11:26
Compound	CAS Number	LOR	Unit	ET2101548-001	ET2101548-002	ET2101548-006	ET2101548-008	ET2101548-009	
				Result	Result	Result	Result	Result	
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05	
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05	
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02	
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02	
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05	
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05	
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05	
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05	
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L	<0.01	<0.01	<0.01	<0.01	<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	%	108	105	107	112	103	
13C8-PFOA	----	0.02	%	97.2	95.8	98.9	100	99.7	



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	0229_SW136_210326	0229_SW130_210326	0229_SW129_210326	0229_SW128_210326	0229_SW126_210326
Sampling date / time				26-Mar-2021 13:39	26-Mar-2021 13:57	26-Mar-2021 14:12	26-Mar-2021 14:24	26-Mar-2021 14:35	
Compound	CAS Number	LOR	Unit	ET2101548-010	ET2101548-012	ET2101548-015	ET2101548-017	ET2101548-018	
				Result	Result	Result	Result	Result	
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	0.04	0.11	0.08	<0.02	<0.02	
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.09	0.04	<0.02	<0.02	
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.02	µg/L	0.16	0.58	0.31	0.05	<0.02	
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.03	<0.02	<0.02	<0.02	
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	0.36	0.69	0.29	0.10	<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	0.03	0.09	<0.02	<0.02	
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	0.05	0.12	0.08	<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	0.03	0.03	<0.01	<0.01	
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02	
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02	
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02	
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02	
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02	
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05	
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02	
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05	
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05	



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	0229_SW136_210326	0229_SW130_210326	0229_SW129_210326	0229_SW128_210326	0229_SW126_210326
Sampling date / time				26-Mar-2021 13:39	26-Mar-2021 13:57	26-Mar-2021 14:12	26-Mar-2021 14:24	26-Mar-2021 14:35	
Compound	CAS Number	LOR	Unit	ET2101548-010	ET2101548-012	ET2101548-015	ET2101548-017	ET2101548-018	
				Result	Result	Result	Result	Result	
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05	
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05	
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02	
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02	
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05	
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05	
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05	
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05	
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L	0.62	1.68	0.94	0.15	<0.01	
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	0.52	1.27	0.60	0.15	<0.01	
Sum of PFAS (WA DER List)	----	0.01	µg/L	0.62	1.56	0.90	0.15	<0.01	
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%	108	108	104	111	110	
13C8-PFOA	----	0.02	%	99.1	98.3	97.9	98.1	98.6	



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)		Sample ID		0229_QC300_210326	----	----	----	----
		Sampling date / time		26-Mar-2021 15:16	----	----	----	----
Compound	CAS Number	LOR	Unit	ET2101548-020	-----	-----	-----	-----
				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	0.02	µg/L	<0.02	----	----	----	----
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	----	----	----	----
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	----	----	----	----



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)		Sample ID	0229_QC300_210326	----	----	----	----
		Sampling date / time	26-Mar-2021 15:16	----	----	----	----
Compound	CAS Number	LOR	Unit	ET2101548-020	-----	-----	-----
				Result	----	----	----
EP231C: Perfluoroalkyl Sulfonamides - Continued							
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	%	108	----	----	----
13C8-PFOA	----	0.02	%	99.7	----	----	----



Surrogate Control Limits

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

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

Inter-Laboratory Testing

Analysis conducted by ALS Brisbane, NATA accreditation no. 825, site no. 818 (Chemistry) 18958 (Biology).

- (WATER) EP231B: Perfluoroalkyl Carboxylic Acids
- (WATER) EP231C: Perfluoroalkyl Sulfonamides
- (WATER) EP231D: (n:2) Fluorotelomer Sulfonic Acids
- (WATER) EP231P: PFAS Sums
- (WATER) EP231A: Perfluoroalkyl Sulfonic Acids
- (WATER) EP231S: PFAS Surrogate
- (SOIL) EP231B: Perfluoroalkyl Carboxylic Acids
- (SOIL) EP231D: (n:2) Fluorotelomer Sulfonic Acids
- (SOIL) EP231C: Perfluoroalkyl Sulfonamides
- (SOIL) EP231A: Perfluoroalkyl Sulfonic Acids
- (SOIL) EP231P: PFAS Sums
- (SOIL) EP231S: PFAS Surrogate
- (SOIL) EA055: Moisture Content (Dried @ 105-110°C)



QUALITY CONTROL REPORT

Work Order : ET2101548
Amendment : 1

Page : 1 of 10

Client : AECOM Australia Pty Ltd

Laboratory : Environmental Division Townsville

Contact Address [Redacted]

Contact Address [Redacted]

Telephone [Redacted]
Project : QLD_0229_PFASOMP_20

Telephone [Redacted]
Date Samples Received : 26-Mar-2021

Order number : -

Date Analysis Commenced : 31-Mar-2021

C-O-C number : 20735

Issue Date : 08-Apr-2021

Sampler [Redacted]

Site : QLD_0229

Quote number : TV/007/21 - Compass

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.

Table with 3 columns: Signatories, Position, Accreditation Category. Contains redacted information.



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

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: 3596143)									
ET2101548-003	0229_QC100_210326	EA055: Moisture Content	----	0.1	%	16.7	15.2	9.31	0% - 20%
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 3596142)									
ET2101548-003	0229_QC100_210326	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	<0.0002	0.00	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	<0.0002	0.00	No Limit
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	<0.0002	0.00	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	<0.0002	0.00	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	<0.0002	0.00	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	<0.0002	0.00	No Limit
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 3596142)									
ET2101548-003	0229_QC100_210326	EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	<0.0002	0.00	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	<0.0002	0.00	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	<0.0002	0.00	No Limit
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	<0.0002	0.00	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	<0.0002	0.00	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	<0.0002	0.00	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.00	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	<0.0002	0.00	No Limit
		EP231X: Perfluorotridecanoic acid (PFTTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.00	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	<0.0005	0.00	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	<0.001	0.00	No Limit
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 3596142)									
ET2101548-003	0229_QC100_210326	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	<0.0002	0.00	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	<0.0002	0.00	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: 3596142) - continued									
ET2101548-003	0229_QC100_210326	EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	<0.0002	0.00	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	<0.0005	0.00	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	<0.0005	0.00	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	<0.0005	0.00	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	<0.0005	0.00	No Limit
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 3596142)									
ET2101548-003	0229_QC100_210326	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	<0.0005	0.00	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	<0.0005	0.00	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	<0.0005	0.00	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	<0.0005	0.00	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: 3595735)									
EB2108502-002	Anonymous	EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	<0.01	0.00	No Limit
		EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	<0.02	0.00	No Limit
ET2101548-012	0229_SW130_210326	EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	0.69	0.73	5.50	0% - 20%
		EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	0.11	0.12	0.00	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	0.09	0.10	0.00	No Limit
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.02	µg/L	0.58	0.62	7.36	0% - 20%
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	0.03	0.03	0.00	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	<0.02	0.00	No Limit
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 3595735)									
EB2108502-002	Anonymous	EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	<0.01	0.00	No Limit
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	<0.02	0.00	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: 3595735) - continued									
EB2108502-002	Anonymous	EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	<0.05	0.00	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	<0.1	0.00	No Limit
ET2101548-012	0229_SW130_210326	EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	0.03	0.03	0.00	No Limit
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	0.03	0.03	0.00	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	0.12	0.13	0.00	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	<0.05	0.00	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	<0.1	0.00	No Limit
		EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 3595735)							
EB2108502-002	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	<0.05	0.00	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	<0.05	0.00	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	<0.05	0.00	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	<0.05	0.00	No Limit
ET2101548-012	0229_SW130_210326	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	<0.05	0.00	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	<0.05	0.00	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: 3595735) - continued									
ET2101548-012	0229_SW130_210326	EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	<0.05	0.00	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	<0.05	0.00	No Limit
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 3595735)									
EB2108502-002	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	<0.05	0.00	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	<0.05	0.00	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	<0.05	0.00	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	<0.05	0.00	No Limit
ET2101548-012	0229_SW130_210326	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	<0.05	0.00	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	<0.05	0.00	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	<0.05	0.00	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	<0.05	0.00	No Limit
EP231P: PFAS Sums (QC Lot: 3595735)									
EB2108502-002	Anonymous	EP231X: Sum of PFAS	----	0.01	µg/L	<0.01	<0.01	0.00	No Limit
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	<0.01	<0.01	0.00	No Limit
		EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	<0.01	<0.01	0.00	No Limit
ET2101548-012	0229_SW130_210326	EP231X: Sum of PFAS	----	0.01	µg/L	1.68	1.79	6.34	0% - 20%
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	1.27	1.35	6.11	0% - 20%
		EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	1.56	1.66	6.21	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: **SOIL**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
				Result	Spike Concentration	Spike Recovery (%)	Acceptable Limits (%)	
						LCS	Low	High
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 3596142)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	0.0011 mg/kg	102	72.0	128
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	0.00117 mg/kg	96.6	73.0	123
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	0.00118 mg/kg	95.3	67.0	130
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	0.00119 mg/kg	102	70.0	132
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	0.00116 mg/kg	105	68.0	136
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	0.0012 mg/kg	107	59.0	134
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 3596142)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	0.00625 mg/kg	106	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	99.6	70.0	132
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	0.00125 mg/kg	99.6	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	100	72.0	129
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	0.00125 mg/kg	102	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	106	69.0	135
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	96.4	66.0	139
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	0.00312 mg/kg	110	69.0	133
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 3596142)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	0.00125 mg/kg	108	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	105	62.8	140
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	0.00312 mg/kg	101	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	137
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	101	61.0	139
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 3596142)								
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	103	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



Sub-Matrix: **SOIL**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report Result	Laboratory Control Spike (LCS) Report				
					Spike Concentration	Spike Recovery (%)		Acceptable Limits (%)	
						LCS	Low	High	
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 3596142) - continued									
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	0.0012 mg/kg	86.7	54.8	124	

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report Result	Laboratory Control Spike (LCS) Report				
					Spike Concentration	Spike Recovery (%)		Acceptable Limits (%)	
						LCS	Low	High	
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 3595735)									
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	110	71.0	127	
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.02	µg/L	<0.02	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	119	69.0	134	
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.232 µg/L	117	65.0	140	
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.241 µg/L	121	53.0	142	
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 3595735)									
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	1.25 µg/L	124	73.0	129	
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	0.25 µg/L	120	72.0	129	
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	0.25 µg/L	113	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	111	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	108	71.0	129	
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	0.25 µg/L	94.2	69.0	133	
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	0.25 µg/L	116	72.0	134	
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	0.25 µg/L	107	65.0	144	
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	0.625 µg/L	120	71.0	132	
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 3595735)									
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.25 µg/L	84.0	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	122	60.5	138	
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	0.625 µg/L	117	68.3	134	
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	0.625 µg/L	96.7	62.6	138	
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	0.25 µg/L	117	65.0	136	
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	0.25 µg/L	120	61.0	135	
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 3595735)									
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.2343 µg/L	100	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	114	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 (%)	Acceptable Limits (%)	
						LCS	Low	High
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 3595735) - continued								
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	0.24 µg/L	124	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	118	64.2	133
EP231P: PFAS Sums (QCLot: 3595735)								
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: SOIL

Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report			
				Spike Concentration	Spike Recovery(%) MS	Low	High
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 3596142)							
ET2101548-004	0229_SD244_210326	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0011 mg/kg	85.4	72.0	128
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.00117 mg/kg	89.7	73.0	123
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.00118 mg/kg	94.1	67.0	130
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.00119 mg/kg	99.2	70.0	132
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.00116 mg/kg	76.7	68.0	136
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0012 mg/kg	97.9	59.0	134
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 3596142)							
ET2101548-004	0229_SD244_210326	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.00625 mg/kg	100	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	88.4	70.0	132
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.00125 mg/kg	92.8	71.0	131
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.00125 mg/kg	94.8	69.0	133
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.00125 mg/kg	96.4	72.0	129
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.00125 mg/kg	87.6	69.0	133
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.00125 mg/kg	99.2	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	108	66.0	139
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.00312 mg/kg	106	69.0	133
		EP231C: Perfluoroalkyl Sulfonamides (QCLot: 3596142)					
ET2101548-004	0229_SD244_210326	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.00125 mg/kg	90.4	48.0	128
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.00312 mg/kg	98.2	70.0	130



Sub-Matrix: **SOIL**

				Matrix Spike (MS) Report			
				Spike Concentration	SpikeRecovery(%) MS	Acceptable Limits (%)	
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 3596142) - continued							
ET2101548-004	0229_SD244_210326	EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.00312 mg/kg	112	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.00312 mg/kg	101	70.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.00312 mg/kg	108	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.00125 mg/kg	110	63.0	144
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.00125 mg/kg	102	61.0	139
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 3596142)							
ET2101548-004	0229_SD244_210326	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	112	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0012 mg/kg	116	65.0	137
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0012 mg/kg	81.7	70.0	130

Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike Concentration	SpikeRecovery(%) MS	Acceptable Limits (%)	
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 3595735)							
EB2108502-004	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.2218 µg/L	# Not Determined	72.0	130
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.235 µg/L	# Not Determined	71.0	127
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.2352 µg/L	# Not Determined	68.0	131
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.238 µg/L	109	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	129	53.0	142
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 3595735)							
EB2108502-004	Anonymous	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	1.25 µg/L	121	73.0	129
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.25 µg/L	# Not Determined	72.0	129
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.25 µg/L	# Not Determined	72.0	129
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.25 µg/L	113	72.0	130
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.25 µg/L	118	71.0	133
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.25 µg/L	116	69.0	130
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.25 µg/L	107	71.0	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: 3595735) - continued							
EB2108502-004	Anonymous	EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.25 µg/L	93.8	69.0	133
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.25 µg/L	117	72.0	134
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.25 µg/L	116	65.0	144
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.625 µg/L	125	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 3595735)							
EB2108502-004	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.25 µg/L	81.2	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	119	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.625 µg/L	117	70.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.625 µg/L	96.0	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.25 µg/L	120	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: 3595735)							
EB2108502-004	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	127	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.24 µg/L	126	67.0	138
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.2415 µg/L	122	70.0	130

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: ET2101548	Page	: 1 of 6
Amendment	: 1		
Client	: AECOM Australia Pty Ltd	Laboratory	: Environmental Division Townsville
Contact	: [REDACTED]	Telephone	: [REDACTED]
Project	: QLD_0229_PFASOMP_20	Date Samples Received	: 26-Mar-2021
Site	: QLD_0229	Issue Date	: 08-Apr-2021
Sampler	: [REDACTED]	No. of samples received	: 20
Order number	: -	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

- **NO** Quality Control Sample Frequency Outliers exist.



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	
EP231A: Perfluoroalkyl Sulfonic Acids								
HDPE Soil Jar (EP231X) 0229_QC100_210326, 0229_SD245_210326, 0229_SD136_210326, 0229_SD129_210326, 0229_SD126_210326	0229_SD244_210326, 0229_SD227_210326, 0229_SD130_210326, 0229_SD128_210326	26-Mar-2021	31-Mar-2021	22-Sep-2021	✓	01-Apr-2021	10-May-2021	✓
EP231B: Perfluoroalkyl Carboxylic Acids								
HDPE Soil Jar (EP231X) 0229_QC100_210326, 0229_SD245_210326, 0229_SD136_210326, 0229_SD129_210326, 0229_SD126_210326	0229_SD244_210326, 0229_SD227_210326, 0229_SD130_210326, 0229_SD128_210326	26-Mar-2021	31-Mar-2021	22-Sep-2021	✓	01-Apr-2021	10-May-2021	✓
EP231C: Perfluoroalkyl Sulfonamides								
HDPE Soil Jar (EP231X) 0229_QC100_210326, 0229_SD245_210326, 0229_SD136_210326, 0229_SD129_210326, 0229_SD126_210326	0229_SD244_210326, 0229_SD227_210326, 0229_SD130_210326, 0229_SD128_210326	26-Mar-2021	31-Mar-2021	22-Sep-2021	✓	01-Apr-2021	10-May-2021	✓
EP231D: (n:2) Fluorotelomer Sulfonic Acids								
HDPE Soil Jar (EP231X) 0229_QC100_210326, 0229_SD245_210326, 0229_SD136_210326, 0229_SD129_210326, 0229_SD126_210326	0229_SD244_210326, 0229_SD227_210326, 0229_SD130_210326, 0229_SD128_210326	26-Mar-2021	31-Mar-2021	22-Sep-2021	✓	01-Apr-2021	10-May-2021	✓
EP231P: PFAS Sums								
HDPE Soil Jar (EP231X) 0229_QC100_210326, 0229_SD245_210326, 0229_SD136_210326, 0229_SD129_210326, 0229_SD126_210326	0229_SD244_210326, 0229_SD227_210326, 0229_SD130_210326, 0229_SD128_210326	26-Mar-2021	31-Mar-2021	22-Sep-2021	✓	01-Apr-2021	10-May-2021	✓

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	
EP231A: Perfluoroalkyl Sulfonic Acids								
HDPE (no PTFE) (EP231X) 0229_SW227_210326, 0229_SW245_210326, 0229_QC500_210326, 0229_SW130_210326, 0229_SW128_210326, 0229_QC300_210326	0229_SW244_210326, 0229_QC101_210326, 0229_SW136_210326, 0229_SW129_210326, 0229_SW126_210326	26-Mar-2021	31-Mar-2021	22-Sep-2021	✓	31-Mar-2021	22-Sep-2021	✓
EP231B: Perfluoroalkyl Carboxylic Acids								
HDPE (no PTFE) (EP231X) 0229_SW227_210326, 0229_SW245_210326, 0229_QC500_210326, 0229_SW130_210326, 0229_SW128_210326, 0229_QC300_210326	0229_SW244_210326, 0229_QC101_210326, 0229_SW136_210326, 0229_SW129_210326, 0229_SW126_210326	26-Mar-2021	31-Mar-2021	22-Sep-2021	✓	31-Mar-2021	22-Sep-2021	✓
EP231C: Perfluoroalkyl Sulfonamides								
HDPE (no PTFE) (EP231X) 0229_SW227_210326, 0229_SW245_210326, 0229_QC500_210326, 0229_SW130_210326, 0229_SW128_210326, 0229_QC300_210326	0229_SW244_210326, 0229_QC101_210326, 0229_SW136_210326, 0229_SW129_210326, 0229_SW126_210326	26-Mar-2021	31-Mar-2021	22-Sep-2021	✓	31-Mar-2021	22-Sep-2021	✓
EP231D: (n:2) Fluorotelomer Sulfonic Acids								
HDPE (no PTFE) (EP231X) 0229_SW227_210326, 0229_SW245_210326, 0229_QC500_210326, 0229_SW130_210326, 0229_SW128_210326, 0229_QC300_210326	0229_SW244_210326, 0229_QC101_210326, 0229_SW136_210326, 0229_SW129_210326, 0229_SW126_210326	26-Mar-2021	31-Mar-2021	22-Sep-2021	✓	31-Mar-2021	22-Sep-2021	✓
EP231P: PFAS Sums								
HDPE (no PTFE) (EP231X) 0229_SW227_210326, 0229_SW245_210326, 0229_QC500_210326, 0229_SW130_210326, 0229_SW128_210326, 0229_QC300_210326	0229_SW244_210326, 0229_QC101_210326, 0229_SW136_210326, 0229_SW129_210326, 0229_SW126_210326	26-Mar-2021	31-Mar-2021	22-Sep-2021	✓	31-Mar-2021	22-Sep-2021	✓



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	Method	Count		Rate (%)			Quality Control Specification
		QC	Regular	Actual	Expected	Evaluation	
Analytical Methods							
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	1	9	11.11	10.00	✔	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	9	11.11	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	9	11.11	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	9	11.11	5.00	✔	NEPM 2013 B3 & ALS QC Standard

Matrix: WATER

Evaluation: ✖ = Quality Control frequency not within specification ; ✔ = Quality Control frequency within specification.

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



Brief Method Summaries

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

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



SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : ET2101548

Client : AECOM Australia Pty Ltd
Contact : [Redacted]
Address : [Redacted]
E-mail : [Redacted]
Telephone : [Redacted]
Facsimile : [Redacted]
Project : QLD_0229_PFASOMP_20
Order number : -
C-O-C number : 20735
Site : QLD_0229
Sampler : [Redacted]
Laboratory : Environmental Division Townsville
Contact : [Redacted]
Address : [Redacted]
E-mail : [Redacted]
Telephone : [Redacted]
Facsimile : [Redacted]
Page : 1 of 3
Quote number : ET2021AECOMAU0001 (TV/007/21 - Compass)
QC Level : NEPM 2013 B3 & ALS QC Standard

Dates

Date Samples Received : 26-Mar-2021 16:45
Client Requested Due Date : 07-Apr-2021
Issue Date : 31-Mar-2021
Scheduled Reporting Date : 07-Apr-2021

Delivery Details

Mode of Delivery : Client Drop Off
No. of coolers/boxes : 1
Receipt Detail : LARGE ESKY
Security Seal : Intact
Temperature : 8.0°C - Ice present
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
29/3/21: SRN has been resent to acknowledge the change in sample IDs to remove the prefix "QLD_" from all samples. For any further information regarding these adjustments please contact client services at [Redacted]
31.3.21: SRN has been resent to acknowledge change of sample ID for sample #14 as requested by the client via email. For any further information regarding these adjustments please contact client services at [Redacted]
Discounted Package Prices apply only when specific ALS Group Codes ('W', 'S', 'NT' suites) are referenced on COCs.
Please direct any turn around / technical queries to the laboratory contact designated above.
Sample Disposal - Aqueous (3 weeks), Solid (2 months ± 1 week) from receipt of samples.
All analysis will be conducted by ALS Environmental, Brisbane, NATA accreditation no. 825, Site No. 818.
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)
ET2101548-003	26-Mar-2021 11:16	0229_QC100_210326	✓	✓
ET2101548-004	26-Mar-2021 11:19	0229_SD244_210326	✓	✓
ET2101548-005	26-Mar-2021 11:20	0229_SD245_210326	✓	✓
ET2101548-007	26-Mar-2021 11:23	0229_SD227_210326	✓	✓
ET2101548-011	26-Mar-2021 13:40	0229_SD136_210326	✓	✓
ET2101548-013	26-Mar-2021 13:58	0229_SD130_210326	✓	✓
ET2101548-014	26-Mar-2021 14:11	0229_SD129_210326	✓	✓
ET2101548-016	26-Mar-2021 14:23	0229_SD128_210326	✓	✓
ET2101548-019	26-Mar-2021 15:34	0229_SD126_210326	✓	✓

Matrix: **WATER**

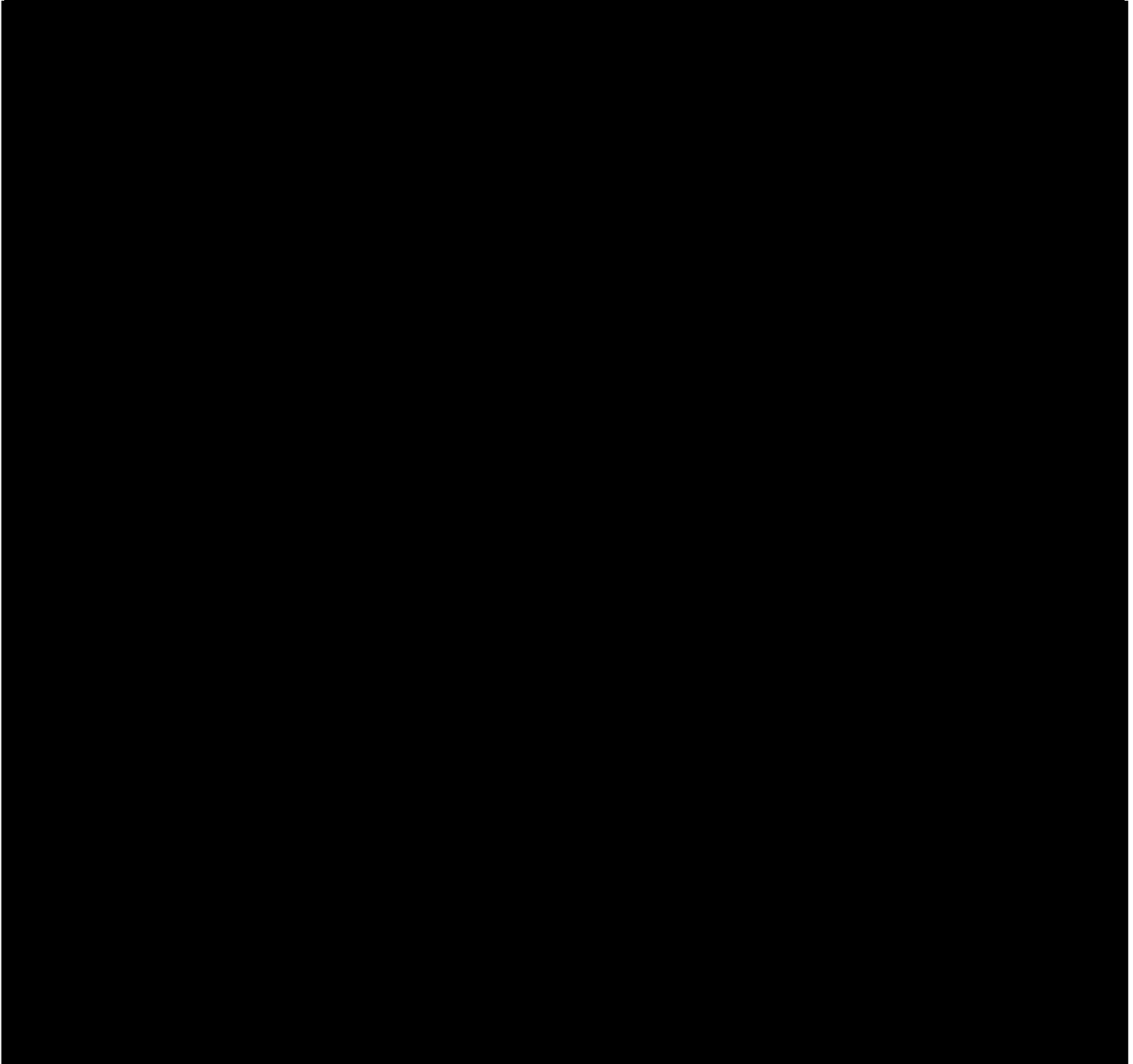
Laboratory sample ID	Sampling date / time	Sample ID	WATER - EP231X PFAS - Full Suite (28 analytes)
ET2101548-001	26-Mar-2021 11:11	0229_SW227_260321	✓
ET2101548-002	26-Mar-2021 09:00	0229_SW244_210326	✓
ET2101548-006	26-Mar-2021 11:22	0229_SW245_210326	✓
ET2101548-008	26-Mar-2021 11:24	0229_QC101_210326	✓
ET2101548-009	26-Mar-2021 11:26	0229_QC500_210326	✓
ET2101548-010	26-Mar-2021 13:39	0229_SW136_210326	✓
ET2101548-012	26-Mar-2021 13:57	0229_SW130_210326	✓
ET2101548-015	26-Mar-2021 14:12	0229_SW129_210326	✓
ET2101548-017	26-Mar-2021 14:24	0229_SW128_260321	✓
ET2101548-018	26-Mar-2021 14:35	0229_SW126_210326	✓
ET2101548-020	26-Mar-2021 15:16	0229_QC300_210326	✓

Proactive Holding Time Report

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



Requested Deliverables





CERTIFICATE OF ANALYSIS

Work Order : ET2101561
Amendment : 1
Client : AECOM Australia Pt. Ltd
Contact : [Redacted]
Address : [Redacted]
Telephone : [Redacted]
Project : QLD_0229_PFASOMP_20
Order number : -
C-O-C number : 20785
Sampler : [Redacted]
Site : QLD_0229
Quote number : TV/007/21 - Compass
No. of samples received : 40
No. of samples analysed : 38

Page : 1 of 19
Laboratory : Environmental Division Townsville
Contact : [Redacted]
Address : [Redacted]
Telephone : [Redacted]
Date Samples Received : 29-Mar-2021 16:44
Date Analysis Commenced : 31-Mar-2021
Issue Date : 13-May-2021 16:52



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.

Table with 3 columns: Signatories, Position, Accreditation Category. All content is redacted.



General Comments

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

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

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

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

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

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contact 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 PFAS: Sample 0229_SD203_210329 shows poor matrix spike recovery due to matrix interference. Confirmed by re-extraction and re-analysis.
- EP231X PFAS: The LOR for particular analytes for samples '0229_QC105_210329' and '0229_SD140_210329' have been raised due to matrix interference.
- 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.
- Amendment-1 (13/05/2021): This report has been amended as a result of a request to reduce the number of samples reported. All analysis results are as per the previous report.
- EP231X PFAS: Sample '0229_SW109_210329' required dilution prior to extraction due to matrix interferences. LOR values have been adjusted accordingly and surrogate recoveries not determined.
- All analysis will be conducted by ALS Environmental, Brisbane, NATA accreditation no. 825, Site No. 818.
- 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.
- 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	0229_SD242_210329	0229_SD203_210329	0229_SD232_210329	0229_SD205_210329	0229_SD217_210329
Sampling date / time				29-Mar-2021 11:05	29-Mar-2021 11:06	29-Mar-2021 11:07	29-Mar-2021 11:07	29-Mar-2021 11:08	
Compound	CAS Number	LOR	Unit	ET2101561-010	ET2101561-011	ET2101561-012	ET2101561-013	ET2101561-014	
				Result	Result	Result	Result	Result	
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content	----	0.1	%	32.2	37.2	49.1	30.8	36.9	
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	0.0005	<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	0.0034	0.0026	0.0018	0.0007	0.0011	
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	0.0006	<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	0.0006	<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	
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	



Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)				Sample ID	0229_SD242_210329	0229_SD203_210329	0229_SD232_210329	0229_SD205_210329	0229_SD217_210329
Sampling date / time					29-Mar-2021 11:05	29-Mar-2021 11:06	29-Mar-2021 11:07	29-Mar-2021 11:07	29-Mar-2021 11:08
Compound	CAS Number	LOR	Unit	ET2101561-010	ET2101561-011	ET2101561-012	ET2101561-013	ET2101561-014	
				Result	Result	Result	Result	Result	
EP231C: Perfluoroalkyl Sulfonamides - Continued									
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	0.0042	0.0031	0.0026	0.0007	0.0011	
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg	0.0034	0.0031	0.0018	0.0007	0.0011	
Sum of PFAS (WA DER List)	----	0.0002	mg/kg	0.0034	0.0031	0.0024	0.0007	0.0011	
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.0002	%	99.5	87.5	91.5	86.0	88.5	
13C8-PFOA	----	0.0002	%	110	100	108	104	99.0	



Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)				Sample ID	0229_SD243_210329	0229_SD233_210329	0229_QC103_210329	0229_SD119_210329	0229_SD120_210329
Sampling date / time				29-Mar-2021 11:09	29-Mar-2021 11:10	29-Mar-2021 11:11	29-Mar-2021 12:36	29-Mar-2021 12:42	
Compound	CAS Number	LOR	Unit	ET2101561-015	ET2101561-016	ET2101561-017	ET2101561-019	ET2101561-020	
				Result	Result	Result	Result	Result	
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content	----	0.1	%	31.8	39.5	44.3	26.3	26.7	
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	0.0023	0.0005	0.0003	<0.0002	
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	0.0003	<0.0002	<0.0002	<0.0002	
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	0.0009	0.0267	0.0034	0.0006	0.0014	
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	0.0005	<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	0.0003	<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	
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	



Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)				Sample ID	0229_SD243_210329	0229_SD233_210329	0229_QC103_210329	0229_SD119_210329	0229_SD120_210329
Sampling date / time					29-Mar-2021 11:09	29-Mar-2021 11:10	29-Mar-2021 11:11	29-Mar-2021 12:36	29-Mar-2021 12:42
Compound	CAS Number	LOR	Unit	ET2101561-015	ET2101561-016	ET2101561-017	ET2101561-019	ET2101561-020	
				Result	Result	Result	Result	Result	
EP231C: Perfluoroalkyl Sulfonamides - Continued									
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	0.0009	0.0300	0.0042	0.0009	0.0014	
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg	0.0009	0.0290	0.0039	0.0009	0.0014	
Sum of PFAS (WA DER List)	----	0.0002	mg/kg	0.0009	0.0297	0.0039	0.0009	0.0014	
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.0002	%	76.5	82.0	78.5	87.0	91.5	
13C8-PFOA	----	0.0002	%	106	97.5	108	108	112	



Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)				Sample ID	0229_SD113_210329	0229_SD109_210329	0229_SD110_210329	0229_SD139_210329	0229_QC105_210329
Sampling date / time				29-Mar-2021 13:22	29-Mar-2021 13:47	29-Mar-2021 14:07	29-Mar-2021 14:28	29-Mar-2021 14:28	29-Mar-2021 14:28
Compound	CAS Number	LOR	Unit	ET2101561-024	ET2101561-026	ET2101561-028	ET2101561-032	ET2101561-033	ET2101561-033
				Result	Result	Result	Result	Result	Result
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0007
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	<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	<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	<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	<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	<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	<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	<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	<0.0005
EP231P: PFAS Sums									
Sum of PFAS	----	0.0002	mg/kg	0.0012	0.101	0.0100	0.0940	0.0882	0.0882
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg	0.0012	0.0880	0.0090	0.0894	0.0829	0.0829
Sum of PFAS (WA DER List)	----	0.0002	mg/kg	0.0012	0.0934	0.0098	0.0912	0.0857	0.0857
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.0002	%	77.5	89.5	80.0	97.0	87.0	87.0
13C8-PFOA	----	0.0002	%	104	101	107	102	106	106



Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)				Sample ID	0229_SD140_210329	0229_SD121_210329	0229_SD135_210329	0229_SD133_210329	----
Sampling date / time				29-Mar-2021 14:58	29-Mar-2021 15:18	29-Mar-2021 15:34	29-Mar-2021 15:47	----	----
Compound	CAS Number	LOR	Unit	ET2101561-035	ET2101561-037	ET2101561-038	ET2101561-040	-----	----
				Result	Result	Result	Result	----	----
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content	----	0.1	%	37.2	42.9	20.9	13.1	----	----
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	0.0039	0.0034	0.0006	<0.0002	----	----
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	0.0006	0.0004	<0.0002	<0.0002	----	----
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	0.0508	0.0198	0.0025	0.0010	----	----
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	0.0011	<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	0.0003	0.0003	<0.0002	<0.0002	----	----
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	0.0006	0.0010	<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	0.0004	0.0004	<0.0002	<0.0002	----	----
Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	0.0005	<0.0002	<0.0002	----	----
Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	0.0003	<0.0002	<0.0002	----	----
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	0.0003	0.0005	<0.0002	<0.0002	----	----
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	0.0007	<0.0002	<0.0002	----	----
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0003	<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	----	----
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	<0.0005	----	----



Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)				Sample ID	0229_SD140_210329	0229_SD121_210329	0229_SD135_210329	0229_SD133_210329	----
Sampling date / time				29-Mar-2021 14:58	29-Mar-2021 15:18	29-Mar-2021 15:34	29-Mar-2021 15:47	----	----
Compound	CAS Number	LOR	Unit	ET2101561-035	ET2101561-037	ET2101561-038	ET2101561-040	-----	----
				Result	Result	Result	Result	----	----
EP231C: Perfluoroalkyl Sulfonamides - Continued									
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	0.0582	0.0277	0.0031	0.0010	----	----
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg	0.0547	0.0232	0.0031	0.0010	----	----
Sum of PFAS (WA DER List)	----	0.0002	mg/kg	0.0560	0.0251	0.0031	0.0010	----	----
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.0002	%	89.5	78.5	88.5	89.5	----	----
13C8-PFOA	----	0.0002	%	108	103	95.5	104	----	----



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	0229_QC501_210329	0229_SW232_210329	0229_SW242_210329	0229_SW205_210329	0229_SW233_210329
Sampling date / time				29-Mar-2021 10:58	29-Mar-2021 10:59	29-Mar-2021 11:00	29-Mar-2021 11:00	29-Mar-2021 11:01	
Compound	CAS Number	LOR	Unit	ET2101561-001	ET2101561-002	ET2101561-003	ET2101561-004	ET2101561-005	
				Result	Result	Result	Result	Result	
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.03	0.03	<0.02	0.09	
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	0.06	
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.02	µg/L	<0.02	0.05	0.07	<0.02	0.44	
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	0.03	
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.05	0.06	0.02	0.69	
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	0.11	
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	0.03	
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02	
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02	
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02	
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02	
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02	
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05	
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02	
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05	
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05	



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	0229_QC501_210329	0229_SW232_210329	0229_SW242_210329	0229_SW205_210329	0229_SW233_210329
Sampling date / time				29-Mar-2021 10:58	29-Mar-2021 10:59	29-Mar-2021 11:00	29-Mar-2021 11:00	29-Mar-2021 11:01	
Compound	CAS Number	LOR	Unit	ET2101561-001	ET2101561-002	ET2101561-003	ET2101561-004	ET2101561-005	
				Result	Result	Result	Result	Result	
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05	
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05	
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02	
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02	
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05	
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05	
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05	
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05	
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L	<0.01	0.13	0.16	0.02	1.47	
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	<0.01	0.10	0.13	0.02	1.13	
Sum of PFAS (WA DER List)	----	0.01	µg/L	<0.01	0.13	0.16	0.02	1.38	
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%	93.5	97.9	87.9	95.6	114	
13C8-PFOA	----	0.02	%	97.5	97.5	98.3	102	100	



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	0229_SW217_210329	0229_SW243_210329	0229_SW203_210329	0229_QC102_210329	0229_SW119_210329
Sampling date / time				29-Mar-2021 11:02	29-Mar-2021 11:03	29-Mar-2021 11:03	29-Mar-2021 11:04	29-Mar-2021 12:35	
Compound	CAS Number	LOR	Unit	ET2101561-006	ET2101561-007	ET2101561-008	ET2101561-009	ET2101561-018	
				Result	Result	Result	Result	Result	
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	<0.02	0.08	0.08	0.12	
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	<0.02	0.04	0.04	0.05	
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.02	µg/L	0.03	<0.02	0.31	0.33	0.33	
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	0.42	0.46	0.42	
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	0.06	0.06	0.10	
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02	
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	<0.01	0.02	0.02	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	



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	0229_SW217_210329	0229_SW243_210329	0229_SW203_210329	0229_QC102_210329	0229_SW119_210329
Sampling date / time					29-Mar-2021 11:02	29-Mar-2021 11:03	29-Mar-2021 11:03	29-Mar-2021 11:04	29-Mar-2021 12:35
Compound	CAS Number	LOR	Unit	ET2101561-006	ET2101561-007	ET2101561-008	ET2101561-009	ET2101561-018	
				Result	Result	Result	Result	Result	
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05	
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05	
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02	
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02	
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05	
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05	
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05	
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05	
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L	0.05	0.02	0.93	1.01	1.06	
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	0.05	0.02	0.73	0.79	0.75	
Sum of PFAS (WA DER List)	----	0.01	µg/L	0.05	0.02	0.89	0.95	1.01	
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%	102	101	90.1	111	99.3	
13C8-PFOA	----	0.02	%	99.6	101	99.5	98.8	99.6	



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	0229_SW120_210329	0229_SW113_210329	0229_SW109_210329	0229_SW110_210329	0229_SW139_210329
Sampling date / time				29-Mar-2021 12:42	29-Mar-2021 13:23	29-Mar-2021 13:48	29-Mar-2021 14:08	29-Mar-2021 14:26	
Compound	CAS Number	LOR	Unit	ET2101561-021	ET2101561-025	ET2101561-027	ET2101561-029	ET2101561-030	
				Result	Result	Result	Result	Result	
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	0.05	0.05	7.25	0.23	0.14	
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	0.02	0.02	7.00	0.16	0.11	
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.02	µg/L	0.17	0.16	55.4	1.47	0.84	
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	<0.02	3.53	0.05	0.06	
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	0.12	0.10	72.5	1.28	1.56	
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	<0.02	<0.50	<0.02	<0.02	
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	<0.1	<2.5	<0.1	<0.1	
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	<0.02	4.12	0.06	0.06	
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	<0.02	20.4	0.25	0.29	
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	<0.02	2.43	0.02	0.03	
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	<0.01	5.61	0.06	0.07	
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	<0.02	<0.50	<0.02	<0.02	
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	<0.02	<0.50	<0.02	<0.02	
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	<0.02	<0.50	<0.02	<0.02	
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	<0.02	<0.50	<0.02	<0.02	
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	<0.02	<0.50	<0.02	<0.02	
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	<0.05	<1.24	<0.05	<0.05	
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	<0.02	<0.50	<0.02	<0.02	
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	<0.05	<1.24	<0.05	<0.05	
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	<0.05	<1.24	<0.05	<0.05	



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	0229_SW120_210329	0229_SW113_210329	0229_SW109_210329	0229_SW110_210329	0229_SW139_210329
Sampling date / time				29-Mar-2021 12:42	29-Mar-2021 13:23	29-Mar-2021 13:48	29-Mar-2021 14:08	29-Mar-2021 14:26	
Compound	CAS Number	LOR	Unit	ET2101561-021	ET2101561-025	ET2101561-027	ET2101561-029	ET2101561-030	
				Result	Result	Result	Result	Result	
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	<0.05	<1.24	<0.05	<0.05	
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	<0.05	<1.24	<0.05	<0.05	
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	<0.02	<0.50	<0.02	<0.02	
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	<0.02	<0.50	<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	<0.50	<0.05	<0.05	
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	<0.05	<0.50	<0.05	<0.05	
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	<0.05	<0.50	<0.05	<0.05	
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	<0.05	<0.50	<0.05	<0.05	
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L	0.36	0.33	178	3.58	3.16	
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	0.29	0.26	128	2.75	2.40	
Sum of PFAS (WA DER List)	----	0.01	µg/L	0.34	0.31	168	3.37	2.99	
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%	93.5	110	Not Determined	99.5	103	
13C8-PFOA	----	0.02	%	99.3	102	Not Determined	99.3	99.6	



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	0229_QC104_210329	0229_SW140_210329	0229_SW121_210329	0229_SW135_210329	----
Sampling date / time				29-Mar-2021 14:27	29-Mar-2021 14:58	29-Mar-2021 15:17	29-Mar-2021 15:37	----	
Compound	CAS Number	LOR	Unit	ET2101561-031	ET2101561-034	ET2101561-036	ET2101561-039	-----	
				Result	Result	Result	Result	----	
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	0.13	0.07	0.16	0.18	----	
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	0.11	0.05	0.10	0.13	----	
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.02	µg/L	0.84	0.42	0.76	2.02	----	
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	0.06	0.02	0.03	0.09	----	
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	1.42	0.62	0.52	3.62	----	
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	0.06	0.03	0.04	0.05	----	
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	0.28	0.12	0.23	0.25	----	
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	0.03	<0.02	0.02	0.03	----	
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	0.07	0.03	0.04	0.07	----	
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	<0.02	<0.02	0.05	----	
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	----	
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	----	
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	----	
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	----	
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	----	
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	----	
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	----	
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	----	



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	0229_QC104_210329	0229_SW140_210329	0229_SW121_210329	0229_SW135_210329	----
Sampling date / time				29-Mar-2021 14:27	29-Mar-2021 14:58	29-Mar-2021 15:17	29-Mar-2021 15:37	----	
Compound	CAS Number	LOR	Unit	ET2101561-031	ET2101561-034	ET2101561-036	ET2101561-039	-----	
				Result	Result	Result	Result	----	
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	----	
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	----	
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	----	
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	----	
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	----	
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	----	
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	----	
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	----	
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L	3.00	1.36	1.90	6.49	----	
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	2.26	1.04	1.28	5.64	----	
Sum of PFAS (WA DER List)	----	0.01	µg/L	2.83	1.29	1.77	6.22	----	
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%	98.0	88.9	108	112	----	
13C8-PFOA	----	0.02	%	102	99.2	102	99.9	----	



Surrogate Control Limits

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

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

Inter-Laboratory Testing

Analysis conducted by ALS Brisbane, NATA accreditation no. 825, site no. 818 (Chemistry) 18958 (Biology).

- (SOIL) EP231D: (n:2) Fluorotelomer Sulfonic Acids
- (SOIL) EP231C: Perfluoroalkyl Sulfonamides
- (SOIL) EP231A: Perfluoroalkyl Sulfonic Acids
- (SOIL) EP231B: Perfluoroalkyl Carboxylic Acids
- (SOIL) EP231P: PFAS Sums
- (SOIL) EP231S: PFAS Surrogate
- (SOIL) EA055: Moisture Content (Dried @ 105-110°C)
- (WATER) EP231A: Perfluoroalkyl Sulfonic Acids
- (WATER) EP231B: Perfluoroalkyl Carboxylic Acids
- (WATER) EP231C: Perfluoroalkyl Sulfonamides
- (WATER) EP231D: (n:2) Fluorotelomer Sulfonic Acids
- (WATER) EP231P: PFAS Sums
- (WATER) EP231S: PFAS Surrogate



QUALITY CONTROL REPORT

Work Order : ET2101561

Page : 1 of 11

Amendment : 1

Client : AECOM Australia Pty Ltd

Laboratory : Environmental Division Townsville

Contact Address [Redacted]

Contact Address [Redacted]

Telephone : ---
Project : QLD_0229_PFASOMP_20

Telephone : ---
Date Samples Received : 29-Mar-2021

Order number : -

Date Analysis Commenced : 31-Mar-2021

C-O-C number : 20785

Issue Date : 13-May-2021

Sampler [Redacted]

Site : QLD_0229

Quote number : TV/007/21 - Compass

No. of samples received : 40

No. of samples analysed : 38



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]	[Redacted]	[Redacted]



General Comments

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

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

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

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: 3597678)									
ET2101561-010	0229_SD242_210329	EA055: Moisture Content	----	0.1	%	32.2	35.6	9.97	0% - 20%
ET2101561-022	0229_SD137_210329	EA055: Moisture Content	----	0.1	%	32.0	31.2	2.56	0% - 20%
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 3597677)									
ET2101561-010	0229_SD242_210329	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	<0.0002	0.00	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	<0.0002	0.00	No Limit
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	<0.0002	0.00	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	<0.0002	0.00	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	0.0034	0.0040	14.9	0% - 20%
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	<0.0002	0.00	No Limit
ET2101561-022	0229_SD137_210329	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	<0.0002	0.00	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	<0.0002	0.00	No Limit
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	<0.0002	0.00	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	<0.0002	0.00	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	0.0007	0.0006	17.2	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	<0.0002	0.00	No Limit
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 3597677)									
ET2101561-010	0229_SD242_210329	EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	<0.0002	0.00	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	<0.0002	0.00	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	<0.0002	0.00	No Limit
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	<0.0002	0.00	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	<0.0002	0.00	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	<0.0002	0.00	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	0.0002	0.0002	0.00	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	0.0006	0.0006	0.00	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: 3597677) - continued									
ET2101561-010	0229_SD242_210329	EP231X: Perfluorotridecanoic acid (PFTTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.00	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	<0.0005	0.00	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	<0.001	0.00	No Limit
ET2101561-022	0229_SD137_210329	EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	<0.0002	0.00	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	<0.0002	0.00	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	<0.0002	0.00	No Limit
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	<0.0002	0.00	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	<0.0002	0.00	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	<0.0002	0.00	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.00	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	<0.0002	0.00	No Limit
		EP231X: Perfluorotridecanoic acid (PFTTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.00	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	<0.0005	0.00	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	<0.001	0.00	No Limit
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 3597677)									
ET2101561-010	0229_SD242_210329	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	<0.0002	0.00	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	<0.0002	0.00	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	<0.0002	0.00	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	<0.0005	0.00	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	<0.0005	0.00	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	<0.0005	0.00	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	<0.0005	0.00	No Limit
ET2101561-022	0229_SD137_210329	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	<0.0002	0.00	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	<0.0002	0.00	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	<0.0002	0.00	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	<0.0005	0.00	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	<0.0005	0.00	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	<0.0005	0.00	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	<0.0005	0.00	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: 3597677)									
ET2101561-010	0229_SD242_210329	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	<0.0005	0.00	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	<0.0005	0.00	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	<0.0005	0.00	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	<0.0005	0.00	No Limit
ET2101561-022	0229_SD137_210329	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	<0.0005	0.00	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	<0.0005	0.00	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	<0.0005	0.00	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	<0.0005	0.00	No Limit
Sub-Matrix: WATER									
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: 3609521)									
ET2101561-003	0229_SW242_210329	EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	0.06	0.07	0.00	No Limit
		EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	0.03	0.03	0.00	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.02	µg/L	0.07	0.06	0.00	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	<0.02	0.00	No Limit
ET2101561-021	0229_SW120_210329	EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	0.12	0.11	0.00	0% - 50%
		EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	0.05	0.06	0.00	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	0.02	0.02	0.00	No Limit
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.02	µg/L	0.17	0.16	0.00	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	<0.02	0.00	No Limit
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 3609521)									
ET2101561-003	0229_SW242_210329	EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	<0.01	0.00	No Limit
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	<0.02	0.00	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: 3609521) - continued									
ET2101561-003	0229_SW242_210329	EP231X: Perfluorotridecanoic acid (PFTTrDA)	72629-94-8	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	<0.05	0.00	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	<0.1	0.00	No Limit
ET2101561-021	0229_SW120_210329	EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	<0.01	0.00	No Limit
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: Perfluorotridecanoic acid (PFTTrDA)	72629-94-8	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	<0.05	0.00	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	<0.1	0.00	No Limit
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 3609521)									
ET2101561-003	0229_SW242_210329	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	<0.05	0.00	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	<0.05	0.00	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	<0.05	0.00	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	<0.05	0.00	No Limit
ET2101561-021	0229_SW120_210329	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	<0.05	0.00	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	<0.05	0.00	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	<0.05	0.00	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	<0.05	0.00	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: 3609521)									
ET2101561-003	0229_SW242_210329	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	<0.05	0.00	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	<0.05	0.00	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	<0.05	0.00	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	<0.05	0.00	No Limit
ET2101561-021	0229_SW120_210329	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	<0.05	0.00	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	<0.05	0.00	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	<0.05	0.00	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	<0.05	0.00	No Limit
EP231P: PFAS Sums (QC Lot: 3609521)									
ET2101561-003	0229_SW242_210329	EP231X: Sum of PFAS	----	0.01	µg/L	0.16	0.16	0.00	0% - 50%
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	0.13	0.13	0.00	0% - 50%
		EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	0.16	0.16	0.00	0% - 50%
ET2101561-021	0229_SW120_210329	EP231X: Sum of PFAS	----	0.01	µg/L	0.36	0.35	2.82	0% - 20%
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	0.29	0.27	7.14	0% - 20%
		EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	0.34	0.33	2.98	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: **SOIL**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
				Result	Spike Concentration	Spike Recovery (%)	Acceptable Limits (%)	
						LCS	Low	High
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 3597677)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	0.0011 mg/kg	95.0	72.0	128
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	0.00117 mg/kg	89.3	73.0	123
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	0.00118 mg/kg	94.9	67.0	130
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	0.00119 mg/kg	101	70.0	132
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	0.00116 mg/kg	91.8	68.0	136
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	0.0012 mg/kg	100	59.0	134
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 3597677)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	0.00625 mg/kg	89.2	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	117	70.0	132
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	0.00125 mg/kg	92.8	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	92.4	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	97.2	64.0	136
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	97.6	69.0	135
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	98.0	66.0	139
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	0.00312 mg/kg	98.4	69.0	133
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 3597677)								
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	120	59.6	143
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	0.00312 mg/kg	99.2	62.8	140
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	0.00312 mg/kg	94.9	61.5	139
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	0.00312 mg/kg	95.8	61.9	137
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	88.8	61.0	139
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 3597677)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	0.00117 mg/kg	97.4	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	92.8	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	102	65.0	137



Sub-Matrix: **SOIL**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report Result	Laboratory Control Spike (LCS) Report				
					Spike Concentration	Spike Recovery (%)		Acceptable Limits (%)	
						LCS	Low	High	
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 3597677) - continued									
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	0.0012 mg/kg	95.8	54.8	124	

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report Result	Laboratory Control Spike (LCS) Report				
					Spike Concentration	Spike Recovery (%)		Acceptable Limits (%)	
						LCS	Low	High	
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 3609521)									
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	103	71.0	127	
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.02	µg/L	<0.02	0.2373 µg/L	95.2	68.0	131	
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.238 µg/L	98.7	69.0	134	
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.232 µg/L	98.1	65.0	140	
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.241 µg/L	107	53.0	142	
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 3609521)									
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	1.25 µg/L	96.2	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	104	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	101	71.0	133	
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	0.25 µg/L	93.4	69.0	130	
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	0.25 µg/L	99.0	71.0	129	
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	0.25 µg/L	99.4	69.0	133	
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	0.25 µg/L	112	72.0	134	
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	0.25 µg/L	96.6	65.0	144	
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	0.625 µg/L	91.8	71.0	132	
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 3609521)									
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.25 µg/L	98.8	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	93.0	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	88.2	62.6	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	98.2	61.0	135	
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 3609521)									
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.2343 µg/L	96.7	63.0	143	
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	0.2378 µg/L	95.7	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 (%)	Acceptable Limits (%)	
						LCS	Low	High
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 3609521) - continued								
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	103	64.2	133
EP231P: PFAS Sums (QCLot: 3609521)								
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: **SOIL**

Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report			
				Spike Concentration	Spike Recovery(%) MS	Low	High
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 3597677)							
ET2101561-011	0229_SD203_210329	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0011 mg/kg	76.8	72.0	128
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.00117 mg/kg	76.1	73.0	123
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.00118 mg/kg	74.2	67.0	130
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.00119 mg/kg	82.8	70.0	132
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.00116 mg/kg	76.9	68.0	136
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0012 mg/kg	# 57.5	59.0	134
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 3597677)							
ET2101561-011	0229_SD203_210329	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.00625 mg/kg	71.2	71.0	135
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.00125 mg/kg	75.2	69.0	132
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.00125 mg/kg	79.2	70.0	132
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.00125 mg/kg	74.8	71.0	131
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.00125 mg/kg	75.6	69.0	133
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.00125 mg/kg	73.6	72.0	129
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.00125 mg/kg	75.2	69.0	133
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.00125 mg/kg	73.6	64.0	136
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.00125 mg/kg	77.2	69.0	135
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.00125 mg/kg	104	66.0	139
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.00312 mg/kg	84.4	69.0	133
		EP231C: Perfluoroalkyl Sulfonamides (QCLot: 3597677)					
ET2101561-011	0229_SD203_210329	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.00125 mg/kg	81.2	48.0	128
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.00312 mg/kg	78.7	70.0	130



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: 3597677) - continued							
ET2101561-011	0229_SD203_210329	EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.00312 mg/kg	75.2	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.00312 mg/kg	75.0	70.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.00312 mg/kg	76.1	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.00125 mg/kg	69.2	63.0	144
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.00125 mg/kg	75.6	61.0	139
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 3597677)							
ET2101561-011	0229_SD203_210329	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.00117 mg/kg	82.9	62.0	145
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.00118 mg/kg	76.7	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0012 mg/kg	81.7	65.0	137
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0012 mg/kg	# 39.2	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
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 3609521)							
ET2101561-002	0229_SW232_210329	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.2218 µg/L	99.9	72.0	130
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.235 µg/L	94.8	71.0	127
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.2352 µg/L	88.1	68.0	131
		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	90.7	65.0	140
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.241 µg/L	94.8	53.0	142
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 3609521)							
ET2101561-002	0229_SW232_210329	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	1.25 µg/L	104	73.0	129
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.25 µg/L	103	72.0	129
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.25 µg/L	98.0	72.0	129
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.25 µg/L	95.3	72.0	130
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.25 µg/L	97.3	71.0	133
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.25 µg/L	90.2	69.0	130
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.25 µg/L	102	71.0	129
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.25 µg/L	94.0	69.0	133
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.25 µg/L	108	72.0	134
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.25 µg/L	93.0	65.0	144
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.625 µg/L	88.5	71.0	132
		EP231C: Perfluoroalkyl Sulfonamides (QCLot: 3609521)					
ET2101561-002	0229_SW232_210329	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.25 µg/L	88.6	59.0	135



Sub-Matrix: WATER

				Matrix Spike (MS) Report			
				Spike	Spike Recovery(%)	Acceptable Limits (%)	
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 3609521) - continued							
ET2101561-002	0229_SW232_210329	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	81.8	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.625 µg/L	105	70.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.625 µg/L	77.4	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.25 µg/L	99.2	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: 3609521)							
ET2101561-002	0229_SW232_210329	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.234 µg/L	99.1	63.0	143
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.2378 µg/L	91.6	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.24 µg/L	90.2	67.0	138
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.2415 µg/L	126	70.0	130

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: ET2101561	Page	: 1 of 8
Amendment	: 1		
Client	: AECOM Australia Pty Ltd	Laboratory	: Environmental Division Townsville
Contact	[REDACTED]	Telephone	[REDACTED]
Project	: QLD_0229_PFASOMP_20	Date Samples Received	: 29-Mar-2021
Site	: QLD_0229	Issue Date	: 13-May-2021
Sampler	[REDACTED]	No. of samples received	: 40
Order number	: -	No. of samples analysed	: 38

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	ET2101561--011	0229_SD203_210329	Perfluorodecane sulfonic acid (PFDS)	335-77-3	57.5 %	59.0-134%	Recovery less than lower data quality objective
EP231D: (n:2) Fluorotelomer Sulfonic Acids	ET2101561--011	0229_SD203_210329	10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	39.2 %	70.0-130%	Recovery less than lower 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: **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)								
0229_SD242_210329, 0229_SD232_210329, 0229_SD217_210329, 0229_SD233_210329, 0229_SD119_210329, 0229_SD113_210329, 0229_SD110_210329, 0229_QC105_210329, 0229_SD121_210329, 0229_SD133_210329,	0229_SD203_210329, 0229_SD205_210329, 0229_SD243_210329, 0229_QC103_210329, 0229_SD120_210329, 0229_SD109_210329, 0229_SD139_210329, 0229_SD140_210329, 0229_SD135_210329,	29-Mar-2021	----	----	----	31-Mar-2021	12-Apr-2021	✓



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	
EP231A: Perfluoroalkyl Sulfonic Acids								
HDPE Soil Jar (EP231X)								
0229_SD242_210329,	0229_SD203_210329,	29-Mar-2021	08-Apr-2021	25-Sep-2021	✓	09-Apr-2021	18-May-2021	✓
0229_SD232_210329,	0229_SD205_210329,							
0229_SD217_210329,	0229_SD243_210329,							
0229_SD233_210329,	0229_QC103_210329,							
0229_SD119_210329,	0229_SD120_210329,							
0229_SD113_210329,	0229_SD109_210329,							
0229_SD110_210329,	0229_SD139_210329,							
0229_QC105_210329,	0229_SD140_210329,							
0229_SD121_210329,	0229_SD135_210329,							
0229_SD133_210329								
EP231B: Perfluoroalkyl Carboxylic Acids								
HDPE Soil Jar (EP231X)								
0229_SD242_210329,	0229_SD203_210329,	29-Mar-2021	08-Apr-2021	25-Sep-2021	✓	09-Apr-2021	18-May-2021	✓
0229_SD232_210329,	0229_SD205_210329,							
0229_SD217_210329,	0229_SD243_210329,							
0229_SD233_210329,	0229_QC103_210329,							
0229_SD119_210329,	0229_SD120_210329,							
0229_SD113_210329,	0229_SD109_210329,							
0229_SD110_210329,	0229_SD139_210329,							
0229_QC105_210329,	0229_SD140_210329,							
0229_SD121_210329,	0229_SD135_210329,							
0229_SD133_210329								
EP231C: Perfluoroalkyl Sulfonamides								
HDPE Soil Jar (EP231X)								
0229_SD242_210329,	0229_SD203_210329,	29-Mar-2021	08-Apr-2021	25-Sep-2021	✓	09-Apr-2021	18-May-2021	✓
0229_SD232_210329,	0229_SD205_210329,							
0229_SD217_210329,	0229_SD243_210329,							
0229_SD233_210329,	0229_QC103_210329,							
0229_SD119_210329,	0229_SD120_210329,							
0229_SD113_210329,	0229_SD109_210329,							
0229_SD110_210329,	0229_SD139_210329,							
0229_QC105_210329,	0229_SD140_210329,							
0229_SD121_210329,	0229_SD135_210329,							
0229_SD133_210329								



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)								
0229_QC501_210329,	0229_SW232_210329,	29-Mar-2021	09-Apr-2021	25-Sep-2021	✓	09-Apr-2021	25-Sep-2021	✓
0229_SW242_210329,	0229_SW205_210329,							
0229_SW233_210329,	0229_SW217_210329,							
0229_SW243_210329,	0229_SW203_210329,							
0229_QC102_210329,	0229_SW119_210329,							
0229_SW120_210329,	0229_SW113_210329,							
0229_SW109_210329,	0229_SW110_210329,							
0229_SW139_210329,	0229_QC104_210329,							
0229_SW140_210329,	0229_SW121_210329,							
0229_SW135_210329								
EP231C: Perfluoroalkyl Sulfonamides								
HDPE (no PTFE) (EP231X)								
0229_QC501_210329,	0229_SW232_210329,	29-Mar-2021	09-Apr-2021	25-Sep-2021	✓	09-Apr-2021	25-Sep-2021	✓
0229_SW242_210329,	0229_SW205_210329,							
0229_SW233_210329,	0229_SW217_210329,							
0229_SW243_210329,	0229_SW203_210329,							
0229_QC102_210329,	0229_SW119_210329,							
0229_SW120_210329,	0229_SW113_210329,							
0229_SW109_210329,	0229_SW110_210329,							
0229_SW139_210329,	0229_QC104_210329,							
0229_SW140_210329,	0229_SW121_210329,							
0229_SW135_210329								
EP231D: (n:2) Fluorotelomer Sulfonic Acids								
HDPE (no PTFE) (EP231X)								
0229_QC501_210329,	0229_SW232_210329,	29-Mar-2021	09-Apr-2021	25-Sep-2021	✓	09-Apr-2021	25-Sep-2021	✓
0229_SW242_210329,	0229_SW205_210329,							
0229_SW233_210329,	0229_SW217_210329,							
0229_SW243_210329,	0229_SW203_210329,							
0229_QC102_210329,	0229_SW119_210329,							
0229_SW120_210329,	0229_SW113_210329,							
0229_SW109_210329,	0229_SW110_210329,							
0229_SW139_210329,	0229_QC104_210329,							
0229_SW140_210329,	0229_SW121_210329,							
0229_SW135_210329								



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	Method	Count		Rate (%)			Quality Control Specification
		QC	Regular	Actual	Expected	Evaluation	
Analytical Methods							
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	19	10.53	10.00	✔	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	19	5.26	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	19	5.26	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	19	5.26	5.00	✔	NEPM 2013 B3 & ALS QC Standard

Matrix: WATER

Evaluation: ✖ = Quality Control frequency not within specification ; ✔ = Quality Control frequency within specification.

Quality Control Sample Type	Method	Count		Rate (%)			Quality Control Specification
		QC	Regular	Actual	Expected	Evaluation	
Analytical Methods							
Laboratory Duplicates (DUP)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	19	10.53	10.00	✔	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	19	5.26	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	19	5.26	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	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
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.
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
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.
Solid Phase Extraction (SPE) for PFAS in water	ORG72	WATER	In-house: Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to the sample container. The entire contents are transferred to a solid phase extraction (SPE) cartridge. The sample container is successively rinsed with aliquots of the elution solvent. The eluted extract is combined with an equal volume of reagent water and a portion is filtered for analysis. Method procedures conform to US DoD QSM 5.3, table B-15 requirements.



SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : ET2101561

Client : AECOM Australia Pty Ltd
Contact Address
E-mail
Telephone
Facsimile
Project : QLD_0229_PFASOMP_20
Order number
C-O-C number : 20785
Site : QLD_0229
Sampler
Laboratory : Environmental Division Townsville
Contact Address
E-mail
Telephone
Facsimile
Page : 1 of 4
Quote number : ET2021AECOMAU0001 (TV/007/21 - Compass)
QC Level : NEPM 2013 B3 & ALS QC Standard

Dates

Date Samples Received : 29-Mar-2021 16:44
Client Requested Due Date : 13-Apr-2021
Issue Date : 30-Mar-2021
Scheduled Reporting Date : 13-Apr-2021

Delivery Details

Mode of Delivery : Client Drop Off
No. of coolers/boxes : 2
Receipt Detail : LARGE ESKIES
Security Seal : Not Available
Temperature : 6.3, 8.0°C - Ice present
No. of samples received / analysed : 40 / 40

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
30.3.21: SRN has been resent to acknowledge due date change. For any further information regarding these adjustments please contact client services at
Discounted Package Prices apply only when specific ALS Group Codes ('W', 'S', 'NT' suites) are referenced on COCs.
Please direct any turn around / technical queries to the laboratory contact designated above.
Sample Disposal - Aqueous (3 weeks), Solid (2 months ± 1 week) from receipt of samples.
All analysis will be conducted by ALS Environmental, Brisbane, NATA accreditation no. 825, Site No. 818.
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)
ET2101561-010	29-Mar-2021 11:05	0229_SD242_210329	✓	✓
ET2101561-011	29-Mar-2021 11:06	0229_SD203_210329	✓	✓
ET2101561-012	29-Mar-2021 11:07	0229_SD232_210329	✓	✓
ET2101561-013	29-Mar-2021 11:07	0229_SD205_210329	✓	✓
ET2101561-014	29-Mar-2021 11:08	0229_SD217_210329	✓	✓
ET2101561-015	29-Mar-2021 11:09	0229_SD243_210329	✓	✓
ET2101561-016	29-Mar-2021 11:10	0229_SD233_210329	✓	✓
ET2101561-017	29-Mar-2021 11:11	0229_QC103_210329	✓	✓
ET2101561-019	29-Mar-2021 12:36	0229_SD119_210329	✓	✓
ET2101561-020	29-Mar-2021 12:42	0229_SD120_210329	✓	✓
ET2101561-022	29-Mar-2021 12:56	0229_SD137_210329	✓	✓
ET2101561-024	29-Mar-2021 13:22	0229_SD113_210329	✓	✓
ET2101561-026	29-Mar-2021 13:47	0229_SD109_210329	✓	✓
ET2101561-028	29-Mar-2021 14:07	0229_SD110_210329	✓	✓
ET2101561-032	29-Mar-2021 14:28	0229_SD139_210329	✓	✓
ET2101561-033	29-Mar-2021 14:28	0229_QC105_210329	✓	✓
ET2101561-035	29-Mar-2021 14:58	0229_SD140_210329	✓	✓
ET2101561-037	29-Mar-2021 15:18	0229_SD121_210329	✓	✓
ET2101561-038	29-Mar-2021 15:34	0229_SD135_210329	✓	✓
ET2101561-040	29-Mar-2021 15:47	0229_SD133_210329	✓	✓

Matrix: **WATER**

Laboratory sample ID	Sampling date / time	Sample ID	WATER - EP231X PFAS - Full Suite (28 analytes)
ET2101561-001	29-Mar-2021 10:58	0229_QC501_210329	✓
ET2101561-002	29-Mar-2021 10:59	0229_SW232_210329	✓
ET2101561-003	29-Mar-2021 11:00	0229_SW242_210329	✓



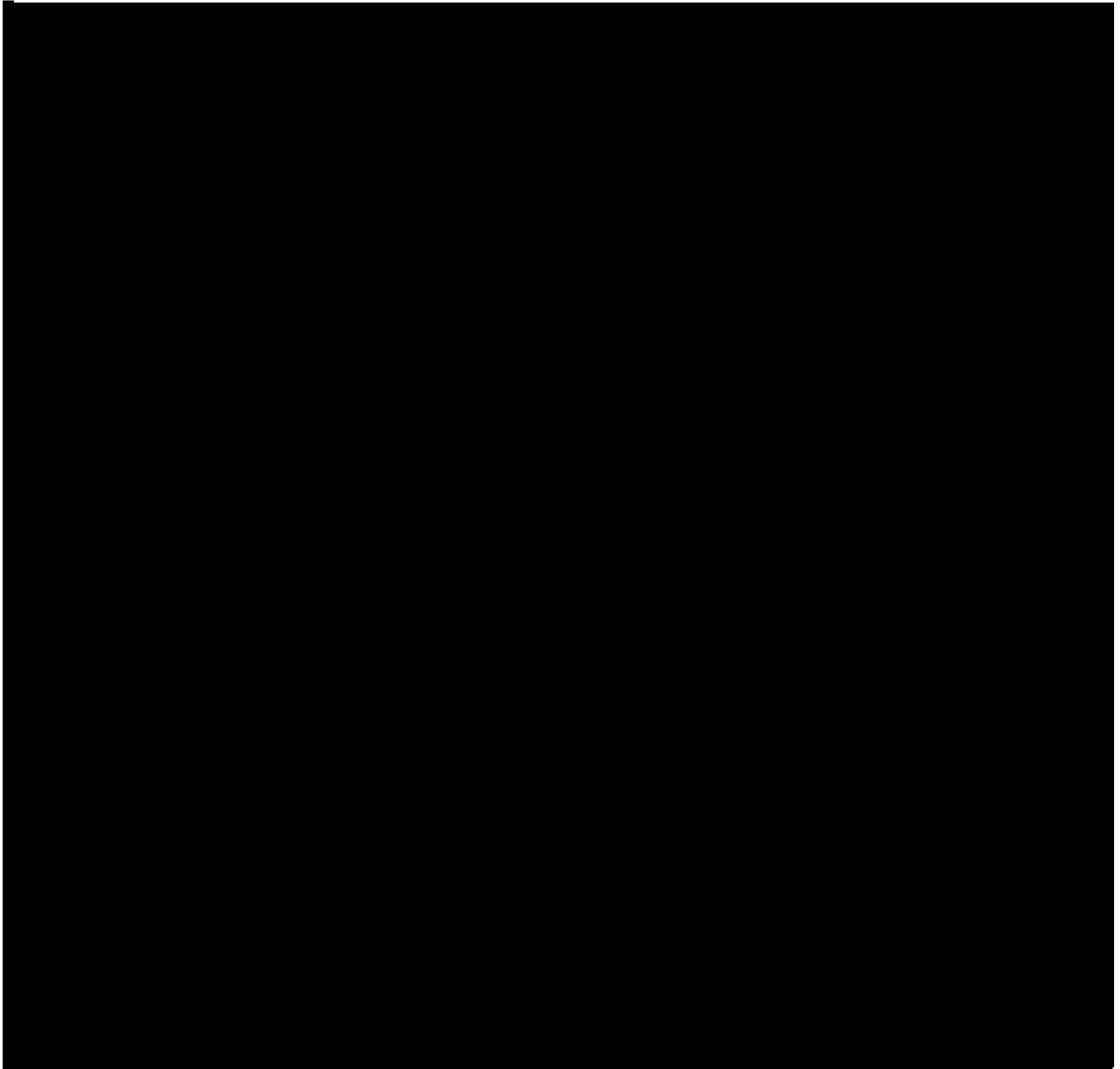
				WATER - EP231X PFAS - Full Suite (28 analytes)
ET2101561-004	29-Mar-2021 11:00	0229_SW205_210329		✓
ET2101561-005	29-Mar-2021 11:01	0229_SW233_210329		✓
ET2101561-006	29-Mar-2021 11:02	0229_SW217_210329		✓
ET2101561-007	29-Mar-2021 11:03	0229_SW243_210329		✓
ET2101561-008	29-Mar-2021 11:03	0229_SW203_210329		✓
ET2101561-009	29-Mar-2021 11:04	0229_QC102_210329		✓
ET2101561-018	29-Mar-2021 12:35	0229_SW119_210329		✓
ET2101561-021	29-Mar-2021 12:42	0229_SW120_210329		✓
ET2101561-023	29-Mar-2021 12:56	0229_SW137_210329		✓
ET2101561-025	29-Mar-2021 13:23	0229_SW113_210329		✓
ET2101561-027	29-Mar-2021 13:48	0229_SW109_210329		✓
ET2101561-029	29-Mar-2021 14:08	0229_SW110_210329		✓
ET2101561-030	29-Mar-2021 14:26	0229_SW139_210329		✓
ET2101561-031	29-Mar-2021 14:27	0229_QC104_210329		✓
ET2101561-034	29-Mar-2021 14:58	0229_SW140_210329		✓
ET2101561-036	29-Mar-2021 15:17	0229_SW121_210329		✓
ET2101561-039	29-Mar-2021 15:37	0229_SW135_210329		✓

Proactive Holding Time Report

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



Requested Deliverables





CERTIFICATE OF ANALYSIS

Work Order : ET2101593
Amendment : 1
Client : AECOM Australia Pty Ltd
Contact : [Redacted]
Address : [Redacted]
Telephone : [Redacted]
Project : QLD_0229_PFASOMP_20
Order number : -
C-O-C number : 20924
Sampler : [Redacted]
Site : QLD_0229
Quote number : TV/007/21 - Compass
No. of samples received : 55
No. of samples analysed : 55

Page : 1 of 33
Laboratory : Environmental Division Townsville
Contact : [Redacted]
Address : [Redacted]
Telephone : [Redacted]
Date Samples Received : 01-Apr-2021 11:55
Date Analysis Commenced : 07-Apr-2021
Issue Date : 19-Apr-2021 15:02



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.

Table with 3 columns: Signatories, Position, Accreditation Category. All cells are redacted.



General Comments

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

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

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

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

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

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contact 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 PFAS: The LORs of PFBA, PFPeA and PFHxA have been raised for sample '0229_MW212_210331' due to matrix interference.
- EP231X PFAS: The LOR of PFBA has been raised for sample '0229_MW115_210331' due to matrix interference.
- EP231X PFAS: Samples '0229_SD220_210401' and '0229_SD134_210401' were diluted due to matrix interference. LOR adjusted accordingly.
- 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.
- Amendment (19.4.21): This report has been amended as a result of a request to change sample identification number (IDs) received from [REDACTED] on 19.4.21, for sample #40. All analysis results are as per the previous report.
- EP231X PFAS: Particular samples required dilution prior to analysis due to matrix interferences. LOR values have been adjusted accordingly and surrogate recoveries not determined.
- EP231X PFAS: Sample '0229_MW117S_210330' required dilution prior to extraction due to matrix interferences. LOR values have been adjusted accordingly.
- EP231X-INJ: Samples '0229_MW217_210331' and '0229_MW124_210331' required dilution prior to extraction due to matrix interferences. LOR values have been adjusted accordingly.
- All analysis will be conducted by ALS Environmental, Brisbane, NATA accreditation no. 825, Site No. 818.
- EP231X-INJ PFAS by LCMSMS: Particular samples have been tested to the legacy QSM 5.1 aligned, NATA accredited method due to sample matrix being unsuitable for SPE extraction (high sediment content).
- 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.
- 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.
- EP231X-INJ: The direct injection LCMSMS method may be used where the sample matrix is not suitable for Solid Phase Extraction (e.g. significant particulate load) or where only a single sample container is received.



Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)		Sample ID		0229_SD220_210401	0229_SD134_210401	0229_SD132_210401	----	----
		Sampling date / time		01-Apr-2021 07:41	01-Apr-2021 09:19	01-Apr-2021 09:37	----	----
Compound	CAS Number	LOR	Unit	ET2101593-047	ET2101593-050	ET2101593-052	-----	-----
				Result	Result	Result	----	----
EA055: Moisture Content (Dried @ 105-110°C)								
Moisture Content	----	0.1	%	44.5	55.9	15.0	----	----
EP231A: Perfluoroalkyl Sulfonic Acids								
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0005	<0.0010	<0.0002	----	----
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0005	<0.0010	<0.0002	----	----
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	0.0068	<0.0010	0.0004	----	----
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	0.0024	<0.0010	<0.0002	----	----
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	0.0963	0.0018	0.0033	----	----
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0005	<0.0010	<0.0002	----	----
EP231B: Perfluoroalkyl Carboxylic Acids								
Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.002	<0.005	<0.001	----	----
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0005	<0.0010	<0.0002	----	----
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0005	<0.0010	<0.0002	----	----
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0005	<0.0010	<0.0002	----	----
Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0005	<0.0010	<0.0002	----	----
Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0005	<0.0010	<0.0002	----	----
Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0005	<0.0010	<0.0002	----	----
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0005	<0.0010	<0.0002	----	----
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0005	<0.0010	<0.0002	----	----
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0005	<0.0010	<0.0002	----	----
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0013	<0.0025	<0.0005	----	----
EP231C: Perfluoroalkyl Sulfonamides								
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0005	<0.0010	<0.0002	----	----
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0013	<0.0025	<0.0005	----	----



Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)				Sample ID	0229_SD220_210401	0229_SD134_210401	0229_SD132_210401	----	----
Sampling date / time				01-Apr-2021 07:41	01-Apr-2021 09:19	01-Apr-2021 09:37	----	----	
Compound	CAS Number	LOR	Unit	ET2101593-047	ET2101593-050	ET2101593-052	-----	-----	
				Result	Result	Result	----	----	
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0013	<0.0025	<0.0005	----	----	
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0013	<0.0025	<0.0005	----	----	
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0013	<0.0025	<0.0005	----	----	
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0005	<0.0010	<0.0002	----	----	
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0005	<0.0010	<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	<0.0010	<0.0005	----	----	
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	<0.0010	<0.0005	----	----	
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	<0.0010	<0.0005	----	----	
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	<0.0010	<0.0005	----	----	
EP231P: PFAS Sums									
Sum of PFAS	----	0.0002	mg/kg	0.106	0.0018	0.0037	----	----	
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg	0.103	0.0018	0.0037	----	----	
Sum of PFAS (WA DER List)	----	0.0002	mg/kg	0.103	0.0018	0.0037	----	----	
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.0002	%	85.0	130	112	----	----	
13C8-PFOA	----	0.0002	%	90.0	115	106	----	----	



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	0229_MW002_210331	0229_MW114_210331	0229_MW139_210331	0229_MW120_210331	0229_MW106_210331
Sampling date / time				31-Mar-2021 16:16	31-Mar-2021 16:17	31-Mar-2021 16:18	31-Mar-2021 16:19	31-Mar-2021 16:20	
Compound	CAS Number	LOR	Unit	ET2101593-001	ET2101593-002	ET2101593-003	ET2101593-004	ET2101593-005	
				Result	Result	Result	Result	Result	
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	0.14	2.58	0.11	0.19	0.08	
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	0.13	2.80	0.14	0.03	<0.02	
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.02	µg/L	2.19	15.2	1.47	0.16	0.07	
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	0.09	~0.75	0.07	<0.02	<0.02	
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	2.72	2.15	2.85	0.12	0.05	
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	<0.08	<0.02	<0.02	<0.02	
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	0.7	<0.1	<0.1	<0.1	
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	0.03	1.01	0.03	<0.02	<0.02	
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	0.18	5.68	0.12	0.02	<0.02	
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	0.02	0.92	<0.02	<0.02	<0.02	
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	0.06	1.32	0.04	<0.01	<0.01	
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	0.05	<0.08	<0.02	<0.02	<0.02	
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	<0.08	<0.02	<0.02	<0.02	
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	<0.08	<0.02	<0.02	<0.02	
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	<0.08	<0.02	<0.02	<0.02	
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	<0.08	<0.02	<0.02	<0.02	
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	<0.21	<0.05	<0.05	<0.05	
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	<0.08	<0.02	<0.02	<0.02	
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	<0.21	<0.05	<0.05	<0.05	
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	<0.21	<0.05	<0.05	<0.05	



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	0229_MW002_210331	0229_MW114_210331	0229_MW139_210331	0229_MW120_210331	0229_MW106_210331
Sampling date / time				31-Mar-2021 16:16	31-Mar-2021 16:17	31-Mar-2021 16:18	31-Mar-2021 16:19	31-Mar-2021 16:20	
Compound	CAS Number	LOR	Unit	ET2101593-001	ET2101593-002	ET2101593-003	ET2101593-004	ET2101593-005	
				Result	Result	Result	Result	Result	
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	<0.21	<0.05	<0.05	<0.05	
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	<0.21	<0.05	<0.05	<0.05	
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	<0.08	<0.02	<0.02	<0.02	
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	<0.08	<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	<0.08	<0.05	<0.05	<0.05	
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	<0.08	<0.05	<0.05	<0.05	
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	<0.08	<0.05	<0.05	<0.05	
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	<0.08	<0.05	<0.05	<0.05	
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L	5.61	33.1	4.83	0.52	0.20	
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	4.91	17.4	4.32	0.28	0.12	
Sum of PFAS (WA DER List)	----	0.01	µg/L	5.34	29.6	4.62	0.49	0.20	
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%	93.2	100	87.0	102	99.5	
13C8-PFOA	----	0.02	%	95.7	90.0	97.0	98.5	96.6	



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	0229_MW072_210331	0229_MW138_210331	0229_MW131_210331	0229_MW128_210331	0229_MW101_210331
Sampling date / time				31-Mar-2021 16:21	31-Mar-2021 16:22	31-Mar-2021 16:22	31-Mar-2021 16:23	31-Mar-2021 16:24	
Compound	CAS Number	LOR	Unit	ET2101593-006	ET2101593-007	ET2101593-008	ET2101593-009	ET2101593-010	
				Result	Result	Result	Result	Result	
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	----	----	----	----	0.26	
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	----	----	----	----	0.08	
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.02	µg/L	----	----	----	----	0.34	
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	----	----	----	----	<0.02	
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	----	----	----	----	0.34	
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	----	----	----	----	<0.02	
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	7.35	0.90	1.00	34.5	----	
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	8.10	0.95	1.02	43.3	----	
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.02	µg/L	61.4	6.15	4.97	419	----	
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	6.00	0.42	0.23	33.4	----	
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	150	8.81	8.08	876	----	
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.42	<0.04	<0.04	<2.26	----	
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.10	µg/L	----	----	----	----	<0.10	
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	----	----	----	----	<0.02	
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	----	----	----	----	0.06	
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	----	----	----	----	<0.02	
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	----	----	----	----	0.02	
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	



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	0229_MW072_210331	0229_MW138_210331	0229_MW131_210331	0229_MW128_210331	0229_MW101_210331
Sampling date / time				31-Mar-2021 16:21	31-Mar-2021 16:22	31-Mar-2021 16:22	31-Mar-2021 16:22	31-Mar-2021 16:23	31-Mar-2021 16:24
Compound	CAS Number	LOR	Unit	ET2101593-006	ET2101593-007	ET2101593-008	ET2101593-009	ET2101593-010	
				Result	Result	Result	Result	Result	
EP231C: Perfluoroalkyl Sulfonamides - Continued									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.42	<0.04	<0.04	<2.26	----	
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<1.05	<0.10	<0.10	<5.64	----	
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<1.05	<0.10	<0.10	<5.64	----	
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<1.05	<0.10	<0.10	<5.64	----	
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<1.05	<0.10	<0.10	<5.64	----	
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.42	<0.04	<0.04	<2.26	----	
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.42	<0.04	<0.04	<2.26	----	
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	----	----	----	----	0.07	
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	
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.42	<0.05	<0.05	<2.26	----	
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.42	<0.05	0.08	<2.26	----	
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.42	<0.05	<0.05	<2.26	----	
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.42	<0.05	<0.05	<2.26	----	
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L	----	----	----	----	1.17	



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	0229_MW072_210331	0229_MW138_210331	0229_MW131_210331	0229_MW128_210331	0229_MW101_210331
Sampling date / time				31-Mar-2021 16:21	31-Mar-2021 16:22	31-Mar-2021 16:22	31-Mar-2021 16:23	31-Mar-2021 16:24	
Compound	CAS Number	LOR	Unit	ET2101593-006	ET2101593-007	ET2101593-008	ET2101593-009	ET2101593-010	
				Result	Result	Result	Result	Result	
EP231P: PFAS Sums - Continued									
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	----	----	----	----	0.68	
Sum of PFAS (WA DER List)	----	0.01	µg/L	----	----	----	----	1.09	
Sum of PFAS	----	0.01	µg/L	258	19.7	18.8	1620	----	
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	211	15.0	13.0	1300	----	
Sum of PFAS (WA DER List)	----	0.01	µg/L	240	18.3	17.6	1500	----	
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%	Not Determined	103	88.0	Not Determined	----	
13C4-PFOS	----	0.02	%	----	----	----	----	78.5	
13C8-PFOA	----	0.02	%	Not Determined	99.0	97.0	Not Determined	----	
13C8-PFOA	----	0.02	%	----	----	----	----	79.4	



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	0229_MW105_210331	0229_MW115_210331	0229_MW074_210331	0229_MW121_210331	0229_MW018_210331
Sampling date / time				31-Mar-2021 16:25	31-Mar-2021 16:26	31-Mar-2021 16:27	31-Mar-2021 16:28	31-Mar-2021 16:28	
Compound	CAS Number	LOR	Unit	ET2101593-011	ET2101593-012	ET2101593-013	ET2101593-014	ET2101593-015	
				Result	Result	Result	Result	Result	
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	3.76	0.28	3.89	0.04	2.22	
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	4.48	0.12	4.62	0.03	2.19	
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.02	µg/L	31.3	0.32	33.4	0.27	13.8	
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	1.56	<0.02	2.03	<0.02	0.78	
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	29.6	0.46	41.8	0.06	22.8	
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.40	<0.02	<0.40	<0.02	<0.04	
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<2.0	<0.2	<2.0	<0.1	0.4	
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	1.60	0.03	1.58	<0.02	0.72	
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	9.12	0.16	7.38	<0.02	4.23	
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	0.92	<0.02	0.93	<0.02	0.44	
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	1.64	<0.01	2.07	<0.01	0.87	
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.40	<0.02	1.05	<0.02	<0.04	
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.40	<0.02	<0.40	<0.02	<0.04	
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.40	<0.02	<0.40	<0.02	<0.04	
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.40	<0.02	<0.40	<0.02	<0.04	
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.40	<0.02	<0.40	<0.02	<0.04	
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<1.00	<0.05	<1.01	<0.05	<0.09	
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.40	<0.02	<0.40	<0.02	<0.04	
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<1.00	<0.05	<1.01	<0.05	<0.09	
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<1.00	<0.05	<1.01	<0.05	<0.09	



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	0229_MW105_210331	0229_MW115_210331	0229_MW074_210331	0229_MW121_210331	0229_MW018_210331
Sampling date / time					31-Mar-2021 16:25	31-Mar-2021 16:26	31-Mar-2021 16:27	31-Mar-2021 16:28	31-Mar-2021 16:28
Compound	CAS Number	LOR	Unit	ET2101593-011	ET2101593-012	ET2101593-013	ET2101593-014	ET2101593-015	ET2101593-015
				Result	Result	Result	Result	Result	Result
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<1.00	<0.05	<1.01	<0.05	<0.09	<0.09
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<1.00	<0.05	<1.01	<0.05	<0.09	<0.09
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.40	<0.02	<0.40	<0.02	<0.04	<0.04
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.40	<0.02	<0.40	<0.02	<0.04	<0.04
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.40	<0.05	<0.40	<0.05	<0.05	<0.05
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.40	<0.05	<0.40	<0.05	<0.05	<0.05
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.40	<0.05	<0.40	<0.05	<0.05	<0.05
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.40	<0.05	<0.40	<0.05	<0.05	<0.05
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L	84.0	1.37	98.8	0.40	48.4	48.4
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	60.9	0.78	75.2	0.33	36.6	36.6
Sum of PFAS (WA DER List)	----	0.01	µg/L	77.9	1.25	91.0	0.37	45.5	45.5
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%	Not Determined	94.7	Not Determined	99.5	103	103
13C8-PFOA	----	0.02	%	Not Determined	99.8	Not Determined	105	101	101



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	0229_MW135_210331	0229_MW141_210331	0229_MW102_210331	0229_MW116_210331	0229_QC502_210331
Sampling date / time				31-Mar-2021 16:29	31-Mar-2021 16:31	31-Mar-2021 16:33	31-Mar-2021 16:34	31-Mar-2021 16:35	
Compound	CAS Number	LOR	Unit	ET2101593-016	ET2101593-017	ET2101593-018	ET2101593-019	ET2101593-020	
				Result	Result	Result	Result	Result	
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	0.53	0.22	0.14	0.06	<0.02	
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	0.73	0.20	0.12	0.02	<0.02	
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.02	µg/L	14.0	1.61	0.73	0.07	<0.02	
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	0.75	0.07	0.03	<0.02	<0.02	
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	9.54	0.77	0.98	<0.01	<0.01	
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.04	<0.02	<0.02	<0.02	<0.02	
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	0.13	0.10	0.05	<0.02	<0.02	
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	1.04	0.48	0.11	0.02	<0.02	
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	0.13	0.04	0.02	<0.02	<0.02	
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	0.34	0.07	0.04	<0.01	<0.01	
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.04	<0.02	<0.02	<0.02	<0.02	
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.04	<0.02	<0.02	<0.02	<0.02	
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.04	<0.02	<0.02	<0.02	<0.02	
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.04	<0.02	<0.02	<0.02	<0.02	
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.04	<0.02	<0.02	<0.02	<0.02	
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.09	<0.05	<0.05	<0.05	<0.05	
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.04	<0.02	<0.02	<0.02	<0.02	
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.09	<0.05	<0.05	<0.05	<0.05	
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.09	<0.05	<0.05	<0.05	<0.05	



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	0229_MW135_210331	0229_MW141_210331	0229_MW102_210331	0229_MW116_210331	0229_QC502_210331
Sampling date / time					31-Mar-2021 16:29	31-Mar-2021 16:31	31-Mar-2021 16:33	31-Mar-2021 16:34	31-Mar-2021 16:35
Compound	CAS Number	LOR	Unit	ET2101593-016	ET2101593-017	ET2101593-018	ET2101593-019	ET2101593-020	ET2101593-020
				Result	Result	Result	Result	Result	Result
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.09	<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.09	<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.04	<0.02	<0.02	<0.02	<0.02	<0.02
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.04	<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	<0.05
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	<0.05	0.06	<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	<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	<0.05
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L	27.2	3.56	2.38	0.17	0.17	<0.01
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	23.5	2.38	1.71	0.07	0.07	<0.01
Sum of PFAS (WA DER List)	----	0.01	µg/L	25.7	3.29	2.23	0.15	0.15	<0.01
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%	107	106	109	111	111	105
13C8-PFOA	----	0.02	%	103	106	104	102	102	106



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	0229_MW125I_21033 1	0229_QC108_210331	0229_QC109_210331	0229_MW003_210331	0229_QC106_210331
Sampling date / time					31-Mar-2021 16:34	31-Mar-2021 16:37	31-Mar-2021 16:38	31-Mar-2021 16:37	31-Mar-2021 16:39
Compound	CAS Number	LOR	Unit	ET2101593-021	ET2101593-022	ET2101593-023	ET2101593-024	ET2101593-025	ET2101593-025
				Result	Result	Result	Result	Result	Result
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	0.03	6.01	2.41	<0.02	0.04	
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	0.02	6.30	2.31	<0.02	0.03	
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.02	µg/L	0.18	50.0	14.6	<0.02	0.18	
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	5.05	0.86	<0.02	<0.02	
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	0.05	126	24.9	0.04	0.05	
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	<0.37	<0.04	<0.02	<0.02	
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	<1.8	0.4	<0.1	<0.1	
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	2.27	0.78	<0.02	<0.02	
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	0.04	11.2	4.47	<0.02	0.04	
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	1.39	0.47	<0.02	<0.02	
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	3.63	0.93	<0.01	<0.01	
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	3.74	<0.04	<0.02	<0.02	
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	<0.37	<0.04	<0.02	<0.02	
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	<0.37	<0.04	<0.02	<0.02	
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	<0.37	<0.04	<0.02	<0.02	
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	<0.37	<0.04	<0.02	<0.02	
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	<0.92	<0.10	<0.05	<0.05	
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	<0.37	<0.04	<0.02	<0.02	
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	<0.92	<0.10	<0.05	<0.05	
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	<0.92	<0.10	<0.05	<0.05	



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	0229_MW125I_21033 1	0229_QC108_210331	0229_QC109_210331	0229_MW003_210331	0229_QC106_210331
Sampling date / time					31-Mar-2021 16:34	31-Mar-2021 16:37	31-Mar-2021 16:38	31-Mar-2021 16:37	31-Mar-2021 16:39
Compound	CAS Number	LOR	Unit	ET2101593-021	ET2101593-022	ET2101593-023	ET2101593-024	ET2101593-025	ET2101593-025
				Result	Result	Result	Result	Result	Result
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	<0.92	<0.10	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	<0.92	<0.10	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	<0.37	<0.04	<0.02	<0.02	<0.02
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	<0.37	<0.04	<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	<0.37	<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	<0.37	<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	<0.37	<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	<0.37	<0.05	<0.05	<0.05	<0.05
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L	0.32	216	52.1	0.04	0.34	0.34
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	0.23	176	39.5	0.04	0.23	0.23
Sum of PFAS (WA DER List)	----	0.01	µg/L	0.30	200	49.0	0.04	0.31	0.31
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%	111	Not Determined	112	103	116	116
13C8-PFOA	----	0.02	%	106	Not Determined	107	102	106	106



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	0229_MW212_210331	0229_QC303_210331	0229_QC301_210329	0229_MW125S_21033 1	0229_MW205S_21033 1
Sampling date / time					31-Mar-2021 16:41	31-Mar-2021 16:41	29-Mar-2021 16:42	31-Mar-2021 16:45	31-Mar-2021 16:47
Compound	CAS Number	LOR	Unit	ET2101593-026	ET2101593-027	ET2101593-028	ET2101593-029	ET2101593-030	
				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	0.05	<0.02	
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	<0.02	<0.02	0.03	<0.02	
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.02	µg/L	<0.02	<0.02	0.06	0.21	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	<0.01	<0.01	0.02	<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	
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.3	<0.1	<0.1	<0.1	<0.1	
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.07	<0.02	<0.02	<0.02	<0.02	
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.05	<0.02	<0.02	<0.02	<0.02	
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02	
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	<0.01	<0.01	<0.01	<0.01	
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02	
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02	
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02	
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02	
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02	
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05	
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02	
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05	
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05	



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	0229_MW212_210331	0229_QC303_210331	0229_QC301_210329	0229_MW125S_21033 1	0229_MW205S_21033 1
Sampling date / time				31-Mar-2021 16:41	31-Mar-2021 16:41	29-Mar-2021 16:42	31-Mar-2021 16:45	31-Mar-2021 16:47	
Compound	CAS Number	LOR	Unit	ET2101593-026	ET2101593-027	ET2101593-028	ET2101593-029	ET2101593-030	
				Result	Result	Result	Result	Result	
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05	
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05	
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02	
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02	
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05	
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05	
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05	
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05	
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L	<0.01	<0.01	0.08	0.29	0.04	
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	<0.01	<0.01	0.08	0.21	0.04	
Sum of PFAS (WA DER List)	----	0.01	µg/L	<0.01	<0.01	0.08	0.26	0.04	
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%	85.6	110	101	109	111	
13C8-PFOA	----	0.02	%	97.0	106	106	106	103	



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	0229_QC107_210331	0229_MW065_210331	0229_MW233_210331	0229_MW1231_210331 1	0229_QC304_210331
Sampling date / time				31-Mar-2021 16:49	31-Mar-2021 16:49	31-Mar-2021 16:50	31-Mar-2021 16:52	31-Mar-2021 16:50	
Compound	CAS Number	LOR	Unit	ET2101593-031	ET2101593-032	ET2101593-033	ET2101593-034	ET2101593-035	
				Result	Result	Result	Result	Result	
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	0.16	0.40	<0.02	0.17	<0.02	
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	0.11	0.52	<0.02	0.12	<0.02	
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.02	µg/L	0.34	7.19	<0.02	0.37	<0.02	
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.39	<0.02	<0.02	<0.02	
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	10.8	<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	0.2	<0.1	<0.1	<0.1	
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	0.26	<0.02	<0.02	<0.02	
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	0.07	1.58	<0.02	0.07	<0.02	
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	0.11	<0.02	<0.02	<0.02	
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	0.23	<0.01	<0.01	<0.01	
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02	
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02	
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02	
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02	
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02	
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05	
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02	
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05	
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05	



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	0229_QC107_210331	0229_MW065_210331	0229_MW233_210331	0229_MW123I_21033 1	0229_QC304_210331
Sampling date / time				31-Mar-2021 16:49	31-Mar-2021 16:49	31-Mar-2021 16:50	31-Mar-2021 16:52	31-Mar-2021 16:50	
Compound	CAS Number	LOR	Unit	ET2101593-031	ET2101593-032	ET2101593-033	ET2101593-034	ET2101593-035	
				Result	Result	Result	Result	Result	
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05	
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05	
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02	
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02	
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05	
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05	
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05	
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05	
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L	0.68	21.7	<0.01	0.73	<0.01	
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	0.34	18.0	<0.01	0.37	<0.01	
Sum of PFAS (WA DER List)	----	0.01	µg/L	0.57	20.8	<0.01	0.61	<0.01	
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%	90.2	102	98.6	94.3	113	
13C8-PFOA	----	0.02	%	103	104	102	104	104	



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	0229_MW236S_21033 1	0229_MW123S_21033 1	0229_MW122_210331	0229_MW217_210331	0229_MW235S_21033 1
Sampling date / time					31-Mar-2021 16:52	31-Mar-2021 16:53	31-Mar-2021 16:53	31-Mar-2021 16:54	31-Mar-2021 16:55
Compound	CAS Number	LOR	Unit	ET2101593-036 Result	ET2101593-037 Result	ET2101593-038 Result	ET2101593-039 Result	ET2101593-040 Result	
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	0.03	----	0.05	<0.04	0.02	
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	----	<0.02	<0.04	<0.02	
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.02	µg/L	0.08	----	0.06	<0.04	<0.02	
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	----	<0.02	<0.04	<0.02	
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	0.09	----	0.10	<0.04	<0.01	
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	----	<0.02	<0.04	<0.02	
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	----	1.03	----	----	----	
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	----	1.02	----	----	----	
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.02	µg/L	----	17.5	----	----	----	
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	----	2.04	----	----	----	
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	----	2.68	----	----	----	
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	----	<0.02	----	----	----	
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.10	µg/L	<0.10	----	<0.10	<0.20	<0.10	
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	----	<0.02	<0.04	<0.02	
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	----	<0.02	<0.04	<0.02	
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	----	<0.02	<0.04	<0.02	
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	----	<0.01	<0.04	<0.01	
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	----	<0.02	<0.04	<0.02	
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	----	<0.02	<0.04	<0.02	
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	----	<0.02	<0.04	<0.02	
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	----	<0.02	<0.04	<0.02	



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	0229_MW236S_21033 1	0229_MW123S_21033 1	0229_MW122_210331	0229_MW217_210331	0229_MW235S_21033 1
Sampling date / time					31-Mar-2021 16:52	31-Mar-2021 16:53	31-Mar-2021 16:53	31-Mar-2021 16:54	31-Mar-2021 16:55
Compound	CAS Number	LOR	Unit		ET2101593-036	ET2101593-037	ET2101593-038	ET2101593-039	ET2101593-040
					Result	Result	Result	Result	Result
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	----	<0.02	<0.04	<0.02	<0.02
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	----	<0.05	<0.10	<0.05	<0.05
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	----	0.3	----	----	----	----
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	----	0.41	----	----	----	----
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	----	1.61	----	----	----	----
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	----	0.31	----	----	----	----
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	----	0.88	----	----	----	----
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	----	<0.02	<0.04	<0.02	<0.02
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	----	<0.05	<0.10	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	----	<0.05	<0.10	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	----	<0.05	<0.10	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	----	<0.05	<0.10	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	----	<0.02	<0.04	<0.02	<0.02
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	----	<0.02	<0.04	<0.02	<0.02



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	0229_MW236S_21033 1	0229_MW123S_21033 1	0229_MW122_210331	0229_MW217_210331	0229_MW235S_21033 1
Sampling date / time					31-Mar-2021 16:52	31-Mar-2021 16:53	31-Mar-2021 16:53	31-Mar-2021 16:54	31-Mar-2021 16:55
Compound	CAS Number	LOR	Unit		ET2101593-036	ET2101593-037	ET2101593-038	ET2101593-039	ET2101593-040
					Result	Result	Result	Result	Result
EP231C: Perfluoroalkyl Sulfonamides - Continued									
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									
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
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		0.20	----	0.21	<0.04	0.02



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	0229_MW236S_21033 1	0229_MW123S_21033 1	0229_MW122_210331	0229_MW217_210331	0229_MW235S_21033 1
Sampling date / time					31-Mar-2021 16:52	31-Mar-2021 16:53	31-Mar-2021 16:53	31-Mar-2021 16:54	31-Mar-2021 16:55
Compound	CAS Number	LOR	Unit		ET2101593-036	ET2101593-037	ET2101593-038	ET2101593-039	ET2101593-040
					Result	Result	Result	Result	Result
EP231P: PFAS Sums - Continued									
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		0.17	----	0.16	<0.04	<0.01
Sum of PFAS (WA DER List)	----	0.01	µg/L		0.20	----	0.21	<0.04	0.02
Sum of PFAS	----	0.01	µg/L		----	27.8	----	----	----
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		----	20.2	----	----	----
Sum of PFAS (WA DER List)	----	0.01	µg/L		----	24.7	----	----	----
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		----	108	----	----	----
13C4-PFOS	----	0.02	%		99.7	----	98.5	231	96.3
13C8-PFOA	----	0.02	%		----	104	----	----	----
13C8-PFOA	----	0.02	%		102	----	105	221	100



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	0229_MW232_210331	0229_MW119_210330	0229_MW118_210330	0229_MW117S_210330	0229_QC302_210330
Sampling date / time					31-Mar-2021 16:55	30-Mar-2021 16:56	30-Mar-2021 16:58	30-Mar-2021 16:58	30-Mar-2021 17:01
Compound	CAS Number	LOR	Unit	ET2101593-041	ET2101593-042	ET2101593-043	ET2101593-044	ET2101593-045	ET2101593-045
				Result	Result	Result	Result	Result	Result
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	0.15	0.14	0.05	1.19	<0.02	<0.02
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	<0.02	<0.02	1.52	<0.02	<0.02
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.02	µg/L	0.09	0.03	0.04	17.3	<0.02	<0.02
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	<0.02	<0.02	0.75	<0.02	<0.02
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	0.10	<0.01	<0.02	6.57	<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	<0.02
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	<0.1	<0.1	0.3	<0.1	<0.1
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	0.16	<0.02	0.51	<0.02	<0.02
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	0.15	<0.02	3.33	<0.02	<0.02
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	0.09	<0.02	0.26	<0.02	<0.02
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	0.06	<0.01	0.50	<0.01	<0.01
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	<0.02	<0.02	0.05	<0.02	<0.02
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	<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	<0.02
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	<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	<0.02
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	<0.05	<0.05	<0.06	<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	<0.02
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	<0.05	<0.05	<0.06	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	<0.05	<0.05	<0.06	<0.05	<0.05



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	0229_MW232_210331	0229_MW119_210330	0229_MW118_210330	0229_MW117S_210330 0	0229_QC302_210330
Sampling date / time					31-Mar-2021 16:55	30-Mar-2021 16:56	30-Mar-2021 16:58	30-Mar-2021 16:58	30-Mar-2021 17:01
Compound	CAS Number	LOR	Unit	ET2101593-041	ET2101593-042	ET2101593-043	ET2101593-044	ET2101593-045	
				Result	Result	Result	Result	Result	
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	<0.05	<0.05	<0.06	<0.05	
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	<0.05	<0.05	<0.06	<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	0.34	0.63	0.09	32.3	<0.01	
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	0.19	0.03	0.04	23.9	<0.01	
Sum of PFAS (WA DER List)	----	0.01	µg/L	0.34	0.63	0.09	30.0	<0.01	
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%	107	102	107	102	111	
13C8-PFOA	----	0.02	%	106	102	103	105	102	



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	0229_SW220_210401	0229_MW220S_210401	0229_SW134_210401	0229_SW132_210401	0229_QC305_210401
Sampling date / time					01-Apr-2021 07:40	01-Apr-2021 07:52	01-Apr-2021 09:17	01-Apr-2021 09:36	01-Apr-2021 11:20
Compound	CAS Number	LOR	Unit	ET2101593-046	ET2101593-048	ET2101593-049	ET2101593-051	ET2101593-053	ET2101593-053
				Result	Result	Result	Result	Result	Result
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	<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	<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	<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	<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	<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	<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	<0.05
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L	1.67	1.63	<0.01	3.50	<0.01	<0.01
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	1.25	1.09	<0.01	2.55	<0.01	<0.01
Sum of PFAS (WA DER List)	----	0.01	µg/L	1.55	1.40	<0.01	3.24	<0.01	<0.01
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%	112	110	102	105	104	104
13C8-PFOA	----	0.02	%	104	105	104	105	105	103



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	0229_MW117D_21033 0	0229_MW124_210331	----	----	----
Sampling date / time					30-Mar-2021 11:38	31-Mar-2021 11:40	----	----	----
Compound	CAS Number	LOR	Unit	ET2101593-054	ET2101593-055	-----	-----	-----	
				Result	Result	---	---	---	
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	----	<0.25	----	----	----	
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	----	<0.25	----	----	----	
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.02	µg/L	----	<0.25	----	----	----	
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	----	<0.25	----	----	----	
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	----	<0.25	----	----	----	
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	----	<0.25	----	----	----	
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	0.02	µg/L	0.02	----	----	----	----	
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	0.10	µg/L	----	<1.25	----	----	----	
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	----	<0.25	----	----	----	
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	----	<0.25	----	----	----	
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	----	<0.25	----	----	----	
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	----	<0.25	----	----	----	
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	----	<0.25	----	----	----	
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	----	<0.25	----	----	----	
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	----	<0.25	----	----	----	
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	----	<0.25	----	----	----	



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)		Sample ID		0229_MW117D_21033 0	0229_MW124_210331	----	----	----
Sampling date / time				30-Mar-2021 11:38	31-Mar-2021 11:40	----	----	----
Compound	CAS Number	LOR	Unit	ET2101593-054	ET2101593-055	-----	-----	-----
				Result	Result	---	---	---
EP231B: Perfluoroalkyl Carboxylic Acids - Continued								
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	----	<0.25	----	----	----
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	----	<0.62	----	----	----
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	----	<0.25	----	----	----
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	----	<0.62	----	----	----
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	----	<0.62	----	----	----
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	----	<0.62	----	----	----
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	----	<0.62	----	----	----
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	----	<0.25	----	----	----
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	----	<0.25	----	----	----



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	0229_MW117D_21033 0	0229_MW124_210331	----	----	----
Sampling date / time				30-Mar-2021 11:38	31-Mar-2021 11:40	----	----	----	
Compound	CAS Number	LOR	Unit	ET2101593-054	ET2101593-055	-----	-----	-----	
				Result	Result	---	---	---	
EP231C: Perfluoroalkyl Sulfonamides - Continued									
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									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	----	<0.25	----	----	----	----
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	----	<0.25	----	----	----	----
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	----	<0.25	----	----	----	----
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	----	<0.25	----	----	----	----
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	----	<0.25	----	----	----	----



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	0229_MW117D_21033 0	0229_MW124_210331	----	----	----
Sampling date / time				30-Mar-2021 11:38	31-Mar-2021 11:40	----	----	----	
Compound	CAS Number	LOR	Unit	ET2101593-054	ET2101593-055	-----	-----	-----	
				Result	Result	---	---	---	
EP231P: PFAS Sums - Continued									
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	----	<0.25	----	----	----	
Sum of PFAS (WA DER List)	----	0.01	µg/L	----	<0.25	----	----	----	
Sum of PFAS	----	0.01	µg/L	0.02	----	----	----	----	
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	0.02	----	----	----	----	
Sum of PFAS (WA DER List)	----	0.01	µg/L	0.02	----	----	----	----	
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%	103	----	----	----	----	
13C4-PFOS	----	0.02	%	----	476	----	----	----	
13C8-PFOA	----	0.02	%	104	----	----	----	----	
13C8-PFOA	----	0.02	%	----	502	----	----	----	



Surrogate Control Limits

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

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

Inter-Laboratory Testing

Analysis conducted by ALS Brisbane, NATA accreditation no. 825, site no. 818 (Chemistry) 18958 (Biology).

- (WATER) EP231A: Perfluoroalkyl Sulfonic Acids
- (WATER) EP231B: Perfluoroalkyl Carboxylic Acids
- (WATER) EP231C: Perfluoroalkyl Sulfonamides
- (WATER) EP231D: (n:2) Fluorotelomer Sulfonic Acids
- (WATER) EP231P: PFAS Sums
- (WATER) EP231S: PFAS Surrogate
- (SOIL) EP231B: Perfluoroalkyl Carboxylic Acids
- (SOIL) EP231D: (n:2) Fluorotelomer Sulfonic Acids
- (SOIL) EP231C: Perfluoroalkyl Sulfonamides
- (SOIL) EP231A: Perfluoroalkyl Sulfonic Acids
- (SOIL) EP231P: PFAS Sums
- (SOIL) EP231S: PFAS Surrogate
- (SOIL) EA055: Moisture Content (Dried @ 105-110°C)



QUALITY CONTROL REPORT

Work Order : ET2101593

Page : 1 of 23

Amendment : 1

Client : AECOM Australia Pty Ltd

Laboratory : Environmental Division Townsville

Contact Address [Redacted]

Contact Address [Redacted]

Telephone : [Redacted]

Telephone : [Redacted]

Project : QLD_0229_PFASOMP_20

Date Samples Received : 01-Apr-2021

Order number : -

Date Analysis Commenced : 07-Apr-2021

C-O-C number : 20924

Issue Date : 19-Apr-2021

Sampler [Redacted]

Site : QLD_0229

Quote number : TV/007/21 - Compass

No. of samples received : 55

No. of samples analysed : 55



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 Signatory Information]



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

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: 3606556)									
EB2109226-001	Anonymous	EA055: Moisture Content	----	0.1	%	3.2	3.2	0.00	0% - 20%
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 3606555)									
EB2109226-001	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	<0.0002	0.00	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	<0.0002	0.00	No Limit
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	<0.0002	0.00	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	<0.0002	0.00	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	<0.0002	0.00	No Limit
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	<0.0002	0.00	No Limit		
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 3606555)									
EB2109226-001	Anonymous	EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	<0.0002	0.00	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	<0.0002	0.00	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	<0.0002	0.00	No Limit
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	<0.0002	0.00	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	<0.0002	0.00	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	<0.0002	0.00	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.00	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	<0.0002	0.00	No Limit
		EP231X: Perfluorotridecanoic acid (PFTTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.00	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	<0.0005	0.00	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	<0.001	0.00	No Limit
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 3606555)									
EB2109226-001	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	<0.0002	0.00	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	<0.0002	0.00	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: 3606555) - continued									
EB2109226-001	Anonymous	EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	<0.0002	0.00	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	<0.0005	0.00	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	<0.0005	0.00	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	<0.0005	0.00	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	<0.0005	0.00	No Limit
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 3606555)									
EB2109226-001	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	<0.0005	0.00	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	<0.0005	0.00	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	<0.0005	0.00	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	<0.0005	0.00	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: 3611390)									
ET2101593-018	0229_MW102_210331	EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	0.98	1.00	1.52	0% - 20%
		EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	0.14	0.15	0.00	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	0.12	0.11	10.3	No Limit
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.02	µg/L	0.73	0.68	6.24	0% - 20%
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	0.03	0.03	0.00	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	<0.02	0.00	No Limit
ET2101593-024	0229_MW003_210331	EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	0.04	0.03	0.00	No Limit
		EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	<0.02	0.00	No Limit
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 3611394)									
ET2101593-029	0229_MW125S_210331	EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	<0.01	0.00	No Limit
		EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	0.05	0.06	18.2	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	0.03	0.03	0.00	No Limit
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.02	µg/L	0.21	0.20	0.00	0% - 50%
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	<0.02	0.00	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: 3611394) - continued									
ET2101593-029	0229_MW125S_210331	EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	<0.02	0.00	No Limit
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 3611397)									
ET2101593-046	0229_SW220_210401	EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	0.52	0.52	0.00	0% - 20%
		EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	0.12	0.12	0.00	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	0.09	0.09	0.00	No Limit
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.02	µg/L	0.73	0.73	0.00	0% - 20%
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	0.03	0.02	0.00	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	<0.02	0.00	No Limit
ET2101593-051	0229_SW132_210401	EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	1.39	1.31	6.21	0% - 20%
		EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	0.24	0.26	6.90	0% - 50%
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	0.20	0.20	0.00	0% - 50%
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.02	µg/L	1.16	1.17	0.00	0% - 20%
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	0.06	0.05	0.00	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	<0.02	0.00	No Limit
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 3612286)									
ET2101593-003	0229_MW139_210331	EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	2.85	3.06	7.16	0% - 20%
		EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	0.11	0.10	0.00	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	0.14	0.13	0.00	No Limit
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.02	µg/L	1.47	1.42	3.50	0% - 20%
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	0.07	0.06	0.00	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	<0.02	0.00	No Limit
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 3618341)									
ET2101593-010	0229_MW101_210331	EP231X-INJ: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	0.34	0.41	17.3	0% - 20%
		EP231X-INJ: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	0.26	0.30	13.7	0% - 50%
		EP231X-INJ: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	0.08	0.10	24.9	No Limit
		EP231X-INJ: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.02	µg/L	0.34	0.38	10.6	0% - 50%
		EP231X-INJ: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X-INJ: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	<0.02	0.00	No Limit
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 3611390)									
ET2101593-018	0229_MW102_210331	EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	0.04	0.04	0.00	No Limit
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	0.05	0.04	0.00	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	0.11	0.10	10.4	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	0.02	0.02	0.00	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	<0.02	0.00	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: 3611390) - continued									
ET2101593-018	0229_MW102_210331	EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	<0.05	0.00	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	0.1	<0.1	0.00	No Limit
ET2101593-024	0229_MW003_210331	EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	<0.01	0.00	No Limit
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	<0.05	0.00	No Limit
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	<0.1	0.00	No Limit		
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 3611394)									
ET2101593-029	0229_MW125S_210331	EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	<0.01	0.00	No Limit
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	<0.05	0.00	No Limit
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	<0.1	0.00	No Limit		
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 3611397)									
ET2101593-046	0229_SW220_210401	EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	0.02	0.02	0.00	No Limit
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	0.02	0.03	0.00	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	0.14	0.14	0.00	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	<0.05	0.00	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: 3611397) - continued									
ET2101593-046	0229_SW220_210401	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	<0.1	0.00	No Limit
ET2101593-051	0229_SW132_210401	EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	0.08	0.07	0.00	No Limit
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	0.06	0.06	0.00	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	0.27	0.26	0.00	0% - 50%
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	0.04	0.04	0.00	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	<0.05	0.00	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	<0.1	0.00	No Limit
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 3612286)									
ET2101593-003	0229_MW139_210331	EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	0.04	0.04	0.00	No Limit
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	0.03	0.03	0.00	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	0.12	0.12	0.00	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	<0.05	0.00	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	<0.1	0.00	No Limit
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 3618341)									
ET2101593-010	0229_MW101_210331	EP231X-INJ: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	0.02	0.02	0.00	No Limit
		EP231X-INJ: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X-INJ: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	0.06	0.07	18.2	No Limit
		EP231X-INJ: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X-INJ: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X-INJ: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X-INJ: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X-INJ: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X-INJ: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X-INJ: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	<0.05	0.00	No Limit
		EP231X-INJ: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.10	<0.10	0.00	No Limit
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 3611390)									
ET2101593-018	0229_MW102_210331	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	<0.02	0.00	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: 3611390) - continued									
ET2101593-018	0229_MW102_210331	EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	<0.05	0.00	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	<0.05	0.00	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	<0.05	0.00	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	<0.05	0.00	No Limit
ET2101593-024	0229_MW003_210331	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	<0.05	0.00	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	<0.05	0.00	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	<0.05	0.00	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	<0.05	0.00	No Limit
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 3611394)									
ET2101593-029	0229_MW125S_210331	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	<0.05	0.00	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	<0.05	0.00	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	<0.05	0.00	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	<0.05	0.00	No Limit
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 3611397)									
ET2101593-046	0229_SW220_210401	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	<0.02	0.00	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: 3611397) - continued									
ET2101593-046	0229_SW220_210401	EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	<0.05	0.00	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	<0.05	0.00	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	<0.05	0.00	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	<0.05	0.00	No Limit
ET2101593-051	0229_SW132_210401	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	<0.05	0.00	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	<0.05	0.00	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	<0.05	0.00	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	<0.05	0.00	No Limit
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 3612286)									
ET2101593-003	0229_MW139_210331	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	<0.05	0.00	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	<0.05	0.00	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	<0.05	0.00	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	<0.05	0.00	No Limit
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 3618341)									



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: 3618341) - continued									
ET2101593-010	0229_MW101_210331	EP231X-INJ: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X-INJ: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X-INJ: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X-INJ: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	<0.05	0.00	No Limit
		EP231X-INJ: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	<0.05	0.00	No Limit
		EP231X-INJ: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	<0.05	0.00	No Limit
		EP231X-INJ: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	<0.05	0.00	No Limit
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 3611390)									
ET2101593-018	0229_MW102_210331	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	<0.05	0.00	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	0.06	0.06	0.00	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	<0.05	0.00	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	<0.05	0.00	No Limit
ET2101593-024	0229_MW003_210331	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	<0.05	0.00	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	<0.05	0.00	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	<0.05	0.00	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	<0.05	0.00	No Limit
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 3611394)									
ET2101593-029	0229_MW125S_210331	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	<0.05	0.00	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	<0.05	0.00	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	<0.05	0.00	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	<0.05	0.00	No Limit
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 3611397)									



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: 3611397) - continued									
ET2101593-046	0229_SW220_210401	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	<0.05	0.00	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	<0.05	0.00	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	<0.05	0.00	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	<0.05	0.00	No Limit
ET2101593-051	0229_SW132_210401	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	<0.05	0.00	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	<0.05	0.00	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	<0.05	0.00	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	<0.05	0.00	No Limit
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 3612286)									
ET2101593-003	0229_MW139_210331	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	<0.05	0.00	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	<0.05	0.00	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	<0.05	0.00	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	<0.05	0.00	No Limit
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 3618341)									
ET2101593-010	0229_MW101_210331	EP231X-INJ: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	<0.05	0.00	No Limit
		EP231X-INJ: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	0.07	0.08	15.6	No Limit
		EP231X-INJ: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	<0.05	0.00	No Limit
		EP231X-INJ: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	<0.05	0.00	No Limit
EP231P: PFAS Sums (QC Lot: 3611390)									
ET2101593-018	0229_MW102_210331	EP231X: Sum of PFAS	----	0.01	µg/L	2.38	2.23	6.51	0% - 20%
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	1.71	1.68	1.77	0% - 20%
		EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	2.23	2.09	6.48	0% - 20%
ET2101593-024	0229_MW003_210331	EP231X: Sum of PFAS	----	0.01	µg/L	0.04	0.03	28.6	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: 3611390) - continued									
ET2101593-024	0229_MW003_210331	EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	0.04	0.03	28.6	No Limit
		EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	0.04	0.03	28.6	No Limit
EP231P: PFAS Sums (QC Lot: 3611394)									
ET2101593-029	0229_MW125S_210331	EP231X: Sum of PFAS	----	0.01	µg/L	0.29	0.29	0.00	0% - 20%
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	0.21	0.20	4.88	0% - 20%
		EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	0.26	0.26	0.00	0% - 20%
EP231P: PFAS Sums (QC Lot: 3611397)									
ET2101593-046	0229_SW220_210401	EP231X: Sum of PFAS	----	0.01	µg/L	1.67	1.67	0.00	0% - 20%
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	1.25	1.25	0.00	0% - 20%
		EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	1.55	1.56	0.643	0% - 20%
ET2101593-051	0229_SW132_210401	EP231X: Sum of PFAS	----	0.01	µg/L	3.50	3.42	2.31	0% - 20%
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	2.55	2.48	2.78	0% - 20%
		EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	3.24	3.17	2.18	0% - 20%
EP231P: PFAS Sums (QC Lot: 3612286)									
ET2101593-003	0229_MW139_210331	EP231X: Sum of PFAS	----	0.01	µg/L	4.83	4.96	2.66	0% - 20%
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	4.32	4.48	3.64	0% - 20%
		EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	4.62	4.77	3.19	0% - 20%
EP231P: PFAS Sums (QC Lot: 3618341)									
ET2101593-010	0229_MW101_210331	EP231X-INJ: Sum of PFAS	----	0.01	µg/L	1.17	1.36	15.0	0% - 20%
		EP231X-INJ: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	0.68	0.79	15.0	0% - 20%
		EP231X-INJ: Sum of PFAS (WA DER List)	----	0.01	µg/L	1.09	1.26	14.5	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: **SOIL**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report				
				Result	Spike Concentration	Spike Recovery (%)		Acceptable Limits (%)	
						LCS	Low	High	
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 3606555)									
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	0.00117 mg/kg	94.0	73.0	123	
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	0.00118 mg/kg	95.3	67.0	130	
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	0.00119 mg/kg	96.6	70.0	132	
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	0.00116 mg/kg	97.0	68.0	136	
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	0.0012 mg/kg	105	59.0	134	
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 3606555)									
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	0.00625 mg/kg	84.9	71.0	135	
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	0.00125 mg/kg	98.8	69.0	132	
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	0.00125 mg/kg	85.6	70.0	132	
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	0.00125 mg/kg	97.2	71.0	131	
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	98.8	69.0	133	
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	92.0	72.0	129	
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	0.00125 mg/kg	92.8	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	92.4	69.0	135	
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	92.0	66.0	139	
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	0.00312 mg/kg	92.3	69.0	133	
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 3606555)									
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	0.00125 mg/kg	109	67.0	137	
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	0.00312 mg/kg	95.5	59.6	143	
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	0.00312 mg/kg	93.6	62.8	140	
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	0.00312 mg/kg	87.8	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	137	
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	0.00125 mg/kg	90.4	63.0	144	
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	0.00125 mg/kg	87.2	61.0	139	
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 3606555)									
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	0.00117 mg/kg	108	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	103	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	91.2	65.0	137	



Sub-Matrix: **SOIL**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report Result	Laboratory Control Spike (LCS) Report				
					Spike Concentration	Spike Recovery (%)		Acceptable Limits (%)	
						LCS	Low	High	
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 3606555) - continued									
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	0.0012 mg/kg	95.0	54.8	124	

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report Result	Laboratory Control Spike (LCS) Report				
					Spike Concentration	Spike Recovery (%)		Acceptable Limits (%)	
						LCS	Low	High	
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 3611390)									
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.2218 µg/L	78.9	72.0	130	
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.2352 µg/L	74.4	71.0	127	
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.02	µg/L	<0.02	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	92.4	69.0	134	
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.232 µg/L	86.2	65.0	140	
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.241 µg/L	95.4	53.0	142	
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 3611394)									
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	92.3	71.0	127	
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.02	µg/L	<0.02	0.2373 µg/L	85.1	68.0	131	
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.238 µg/L	96.0	69.0	134	
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.232 µg/L	84.5	65.0	140	
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.241 µg/L	94.6	53.0	142	
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 3611397)									
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	92.7	71.0	127	
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.02	µg/L	<0.02	0.2373 µg/L	84.9	68.0	131	
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.238 µg/L	88.4	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	97.9	53.0	142	
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 3612286)									
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.2218 µg/L	87.2	72.0	130	
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.2352 µg/L	93.1	71.0	127	
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.02	µg/L	<0.02	0.2373 µg/L	89.1	68.0	131	
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.238 µg/L	86.8	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	89.4	53.0	142	
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 3618341)									
EP231X-INJ: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.444 µg/L	84.4	72.0	130	
EP231X-INJ: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.47 µg/L	77.0	71.0	127	
EP231X-INJ: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.02	µg/L	<0.02	0.475 µg/L	68.8	68.0	131	
EP231X-INJ: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.477 µg/L	82.0	69.0	134	
EP231X-INJ: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.4646 µg/L	69.5	65.0	140	



Sub-Matrix: WATER

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report				
				Result	Spike Concentration	Spike Recovery (%)		Acceptable Limits (%)	
						LCS	Low	High	
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 3618341) - continued									
EP231X-INJ: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.5 µg/L	83.6	53.0	142	
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 3611390)									
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	1.25 µg/L	95.6	73.0	129	
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	0.25 µg/L	98.0	72.0	129	
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	0.25 µg/L	94.0	72.0	129	
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	0.25 µg/L	92.0	72.0	130	
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	0.25 µg/L	92.0	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	88.0	71.0	129	
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	0.25 µg/L	88.0	69.0	133	
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	0.25 µg/L	96.0	72.0	134	
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	0.25 µg/L	88.0	65.0	144	
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	0.625 µg/L	102	71.0	132	
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 3611394)									
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	1.25 µg/L	85.6	73.0	129	
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	0.25 µg/L	89.4	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	91.0	72.0	130	
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	0.25 µg/L	88.6	71.0	133	
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	0.25 µg/L	90.6	69.0	130	
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	0.25 µg/L	89.0	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	93.0	72.0	134	
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	0.25 µg/L	83.8	65.0	144	
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	0.625 µg/L	85.8	71.0	132	
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 3611397)									
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	1.25 µg/L	82.9	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	84.6	72.0	129	
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	0.25 µg/L	87.4	72.0	130	
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	0.25 µg/L	85.8	71.0	133	
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	0.25 µg/L	83.8	69.0	130	
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	0.25 µg/L	85.6	71.0	129	
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	0.25 µg/L	85.2	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	88.4	65.0	144	
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	0.625 µg/L	92.5	71.0	132	
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 3612286)									



Sub-Matrix: WATER

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report				
				Result	Spike	Spike Recovery (%)		Acceptable Limits (%)	
					Concentration	LCS	Low	High	
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 3612286) - continued									
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	1.25 µg/L	80.5	73.0	129	
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	0.25 µg/L	89.0	72.0	129	
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	0.25 µg/L	86.6	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	87.2	71.0	133	
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	0.25 µg/L	83.6	69.0	130	
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	0.25 µg/L	82.8	71.0	129	
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	0.25 µg/L	78.8	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	80.4	65.0	144	
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	0.625 µg/L	88.4	71.0	132	
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 3618341)									
EP231X-INJ: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.10	2.5 µg/L	82.8	73.0	129	
EP231X-INJ: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	0.5 µg/L	82.6	72.0	129	
EP231X-INJ: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	0.5 µg/L	83.8	72.0	129	
EP231X-INJ: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	0.5 µg/L	84.8	72.0	130	
EP231X-INJ: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	0.5 µg/L	81.2	71.0	133	
EP231X-INJ: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	0.5 µg/L	85.0	69.0	130	
EP231X-INJ: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	0.5 µg/L	86.4	71.0	129	
EP231X-INJ: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	0.5 µg/L	84.6	69.0	133	
EP231X-INJ: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	0.5 µg/L	76.6	72.0	134	
EP231X-INJ: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	0.5 µg/L	75.0	65.0	144	
EP231X-INJ: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	1.25 µg/L	87.7	71.0	132	
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 3611390)									
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	84.0	68.0	141	
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	0.625 µg/L	92.0	60.5	138	
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	0.625 µg/L	95.2	68.3	134	
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	0.625 µg/L	97.6	62.6	138	
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	0.25 µg/L	100	65.0	136	
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	0.25 µg/L	98.0	61.0	135	
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 3611394)									
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	74.4	68.0	141	
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	0.625 µg/L	80.3	60.5	138	



Sub-Matrix: WATER

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report				
				Result	Spike Concentration	Spike Recovery (%)		Acceptable Limits (%)	
						LCS	Low	High	
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 3611394) - continued									
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	0.625 µg/L	94.2	68.3	134	
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	0.625 µg/L	93.8	62.6	138	
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	0.25 µg/L	88.8	65.0	136	
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	0.25 µg/L	90.8	61.0	135	
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 3611397)									
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	92.2	68.0	141	
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	0.625 µg/L	79.8	60.5	138	
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	0.625 µg/L	89.3	68.3	134	
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	0.625 µg/L	93.9	62.6	138	
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	0.25 µg/L	89.8	65.0	136	
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	0.25 µg/L	96.0	61.0	135	
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 3612286)									
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.25 µg/L	120	67.0	137	
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	0.625 µg/L	90.2	68.0	141	
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	0.625 µg/L	87.6	60.5	138	
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	0.625 µg/L	78.4	68.3	134	
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	0.625 µg/L	74.2	62.6	138	
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	0.25 µg/L	90.8	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: 3618341)									
EP231X-INJ: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.5 µg/L	103	67.0	137	
EP231X-INJ: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	1.25 µg/L	97.9	68.0	141	
EP231X-INJ: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	1.25 µg/L	85.4	62.1	136	
EP231X-INJ: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	1.25 µg/L	84.6	65.2	135	



Sub-Matrix: WATER

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
				Result	Spike Concentration	Spike Recovery (%)	Acceptable Limits (%)	
					LCS	Low	High	
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 3618341) - continued								
EP231X-INJ: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	1.25 µg/L	84.1	63.2	135
EP231X-INJ: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	0.5 µg/L	86.4	65.0	136
EP231X-INJ: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	0.5 µg/L	87.2	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 3611390)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.2343 µg/L	91.8	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	92.5	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	95.8	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	85.1	64.2	133
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 3611394)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.2343 µg/L	83.4	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	92.7	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	96.7	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	92.7	64.2	133
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 3611397)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.2343 µg/L	87.9	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	88.5	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	99.0	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	89.2	64.2	133
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 3612286)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.2343 µg/L	84.1	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	90.2	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	80.6	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	88.0	64.2	133
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 3618341)								
EP231X-INJ: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.469 µg/L	87.4	63.0	143
EP231X-INJ: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	0.476 µg/L	95.2	64.0	140
EP231X-INJ: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	0.48 µg/L	85.6	67.0	138
EP231X-INJ: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	0.483 µg/L	87.0	62.2	139
EP231P: PFAS Sums (QCLot: 3611390)								
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: 3611394)								
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 (%)	Acceptable Limits (%)	
						LCS	Low	High
EP231P: PFAS Sums (QCLot: 3611394) - 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: 3611397)								
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: 3612286)								
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: 3618341)								
EP231X-INJ: Sum of PFAS	----	0.01	µg/L	<0.01	----	----	----	----
EP231X-INJ: Sum of PFHxS and PFOS	355-46-4/17 63-23-1	0.01	µg/L	<0.01	----	----	----	----
EP231X-INJ: 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: **SOIL**

Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report			
				Spike Concentration	Spike Recovery(%)	Acceptable Limits (%)	
					MS	Low	High
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 3606555)							
EB2109226-002	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0011 mg/kg	95.9	72.0	128
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.00117 mg/kg	94.4	73.0	123
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.00118 mg/kg	100	67.0	130
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.00119 mg/kg	89.1	70.0	132
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.00116 mg/kg	95.7	68.0	136
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0012 mg/kg	103	59.0	134
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 3606555)							
EB2109226-002	Anonymous	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.00625 mg/kg	87.3	71.0	135
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.00125 mg/kg	103	69.0	132
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.00125 mg/kg	84.0	70.0	132
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.00125 mg/kg	98.4	71.0	131



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: 3606555) - continued							
EB2109226-002	Anonymous	EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.00125 mg/kg	98.8	69.0	133
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.00125 mg/kg	90.0	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	96.4	64.0	136
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.00125 mg/kg	88.8	69.0	135
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.00125 mg/kg	92.4	66.0	139
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.00312 mg/kg	88.6	69.0	133
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 3606555)							
EB2109226-002	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.00125 mg/kg	104	48.0	128
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.00312 mg/kg	101	70.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.00312 mg/kg	90.1	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.00312 mg/kg	87.5	70.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.00312 mg/kg	109	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.00125 mg/kg	87.2	63.0	144
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.00125 mg/kg	94.0	61.0	139
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 3606555)							
EB2109226-002	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.00117 mg/kg	109	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	97.5	65.0	137
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0012 mg/kg	94.2	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
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 3611390)							
ET2101593-019	0229_MW116_210331	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.2218 µg/L	76.0	72.0	130
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.235 µg/L	91.0	71.0	127
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.2352 µg/L	81.9	68.0	131
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.238 µg/L	80.7	69.0	134
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.232 µg/L	90.2	65.0	140
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.241 µg/L	77.4	53.0	142
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 3611394)							
ET2101593-041	0229_MW232_210331	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.2218 µg/L	101	72.0	130
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.235 µg/L	94.2	71.0	127



Sub-Matrix: WATER

Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report			
				Concentration	Spike Recovery(%) MS	Acceptable Limits (%) Low High	
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 3611394) - continued							
ET2101593-041	0229_MW232_210331	EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.2352 µg/L	88.7	68.0	131
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.238 µg/L	98.6	69.0	134
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.232 µg/L	75.4	65.0	140
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.241 µg/L	94.8	53.0	142
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 3611397)							
ET2101593-049	0229_SW134_210401	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.2218 µg/L	95.1	72.0	130
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.235 µg/L	109	71.0	127
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.2352 µg/L	90.6	68.0	131
		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	104	65.0	140
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.241 µg/L	104	53.0	142
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 3618341)							
ET2101593-036	0229_MW236S_210331	EP231X-INJ: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.443 µg/L	84.4	70.0	130
		EP231X-INJ: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.47 µg/L	80.6	70.0	130
		EP231X-INJ: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.475 µg/L	73.7	70.0	130
		EP231X-INJ: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.477 µg/L	86.8	70.0	130
		EP231X-INJ: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.5 µg/L	81.0	70.0	130
		EP231X-INJ: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.482 µg/L	89.8	70.0	130
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 3611390)							
ET2101593-019	0229_MW116_210331	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	1.25 µg/L	86.0	73.0	129
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.25 µg/L	99.5	72.0	129
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.25 µg/L	77.4	72.0	129
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.25 µg/L	80.2	72.0	130
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.25 µg/L	78.0	71.0	133
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.25 µg/L	78.2	69.0	130
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.25 µg/L	76.2	71.0	129
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.25 µg/L	79.2	69.0	133
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.25 µg/L	87.2	72.0	134
		EP231X: Perfluorotridecanoic acid (PFTTrDA)	72629-94-8	0.25 µg/L	83.8	65.0	144
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.625 µg/L	102	71.0	132
		EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 3611394)					
ET2101593-041	0229_MW232_210331	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	1.25 µg/L	94.4	73.0	129
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.25 µg/L	91.4	72.0	129
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.25 µg/L	101	72.0	129
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.25 µg/L	92.9	72.0	130
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.25 µg/L	89.2	71.0	133
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.25 µg/L	94.9	69.0	130
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.25 µg/L	87.3	71.0	129



Sub-Matrix: WATER

				Matrix Spike (MS) Report					
Laboratory sample ID		Sample ID	Method: Compound	CAS Number	Spike Concentration	Spike Recovery(%) MS	Acceptable Limits (%) Low High		
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 3611394) - continued									
ET2101593-041	0229_MW232_210331	EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.25 µg/L	87.0	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	93.0	65.0	144		
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.625 µg/L	84.5	71.0	132		
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 3611397)									
ET2101593-049	0229_SW134_210401	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	1.25 µg/L	98.0	73.0	129		
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.25 µg/L	96.0	72.0	129		
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.25 µg/L	91.1	72.0	129		
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.25 µg/L	96.3	72.0	130		
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.25 µg/L	87.1	71.0	133		
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.25 µg/L	87.9	69.0	130		
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.25 µg/L	91.2	71.0	129		
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.25 µg/L	92.0	69.0	133		
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.25 µg/L	94.4	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	0.625 µg/L	91.0	71.0	132		
		EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 3618341)							
ET2101593-036	0229_MW236S_210331	EP231X-INJ: Perfluorobutanoic acid (PFBA)	375-22-4	2.5 µg/L	83.4	70.0	130		
		EP231X-INJ: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.5 µg/L	85.2	70.0	130		
		EP231X-INJ: Perfluorohexanoic acid (PFHxA)	307-24-4	0.5 µg/L	84.0	70.0	130		
		EP231X-INJ: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.5 µg/L	84.0	70.0	130		
		EP231X-INJ: Perfluorooctanoic acid (PFOA)	335-67-1	0.5 µg/L	81.8	70.0	130		
		EP231X-INJ: Perfluorononanoic acid (PFNA)	375-95-1	0.5 µg/L	83.2	70.0	130		
		EP231X-INJ: Perfluorodecanoic acid (PFDA)	335-76-2	0.5 µg/L	86.8	70.0	130		
		EP231X-INJ: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.5 µg/L	86.4	70.0	130		
		EP231X-INJ: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.5 µg/L	83.6	70.0	130		
		EP231X-INJ: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.5 µg/L	85.0	70.0	130		
		EP231X-INJ: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	1.25 µg/L	86.6	70.0	130		
		EP231C: Perfluoroalkyl Sulfonamides (QCLot: 3611390)							
		ET2101593-019	0229_MW116_210331	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.25 µg/L	75.6	59.0	135
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8			0.625 µg/L	81.1	70.0	130		
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2			0.625 µg/L	87.7	70.0	130		
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7			0.625 µg/L	88.6	70.0	130		
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2			0.625 µg/L	96.6	70.0	130		
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9			0.25 µg/L	93.6	65.0	136		



Sub-Matrix: WATER

				Matrix Spike (MS) Report			
				Spike	Spike Recovery(%)	Acceptable Limits (%)	
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 3611390) - continued							
ET2101593-019	0229_MW116_210331	EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.25 µg/L	104	61.0	135
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 3611394)							
ET2101593-041	0229_MW232_210331	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.25 µg/L	88.6	59.0	135
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.625 µg/L	98.2	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	102	70.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.625 µg/L	85.0	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.25 µg/L	98.2	65.0	136
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.25 µg/L	91.3	61.0	135
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 3611397)							
ET2101593-049	0229_SW134_210401	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.25 µg/L	82.0	59.0	135
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.625 µg/L	96.3	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	99.9	70.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.625 µg/L	92.9	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	69.2	61.0	135
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 3618341)							
ET2101593-036	0229_MW236S_210331	EP231X-INJ: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.5 µg/L	96.2	70.0	130
		EP231X-INJ: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	1.25 µg/L	103	70.0	130
		EP231X-INJ: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	1.25 µg/L	93.0	70.0	130
		EP231X-INJ: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	1.25 µg/L	95.1	70.0	130
		EP231X-INJ: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	1.25 µg/L	93.0	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: 3618341) - continued							
ET2101593-036	0229_MW236S_210331	EP231X-INJ: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.5 µg/L	91.8	70.0	130
		EP231X-INJ: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.5 µg/L	94.0	70.0	130
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 3611390)							
ET2101593-019	0229_MW116_210331	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.234 µg/L	90.6	63.0	143
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.2378 µg/L	99.0	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.24 µg/L	99.4	67.0	138
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.2415 µg/L	109	70.0	130
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 3611394)							
ET2101593-041	0229_MW232_210331	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.234 µg/L	91.9	63.0	143
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.2378 µg/L	93.7	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.24 µg/L	88.1	67.0	138
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.2415 µg/L	123	70.0	130
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 3611397)							
ET2101593-049	0229_SW134_210401	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.234 µg/L	95.9	63.0	143
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.2378 µg/L	110	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.24 µg/L	89.4	67.0	138
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.2415 µg/L	84.8	70.0	130
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 3618341)							
ET2101593-036	0229_MW236S_210331	EP231X-INJ: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.468 µg/L	87.0	70.0	130
		EP231X-INJ: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.475 µg/L	85.5	70.0	130
		EP231X-INJ: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.48 µg/L	84.2	70.0	130
		EP231X-INJ: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.483 µg/L	117	70.0	130

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: ET2101593	Page	: 1 of 10
Amendment	: 1		
Client	: AECOM Australia Pty Ltd	Laboratory	: Environmental Division Townsville
Contact	: [REDACTED]	Telephone	: [REDACTED]
Project	: QLD_0229_PFASOMP_20	Date Samples Received	: 01-Apr-2021
Site	: QLD_0229	Issue Date	: 19-Apr-2021
Sampler	: [REDACTED]	No. of samples received	: 55
Order number	: -	No. of samples analysed	: 55

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.
- 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

- **NO** Quality Control Sample Frequency Outliers exist.



Regular Sample Surrogates

Sub-Matrix: **WATER**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
Samples Submitted							
EP231S: PFAS Surrogate	ET2101593-039	0229_MW217_210331	13C4-PFOS	----	231 %	65.0-140 %	Recovery greater than upper data quality objective
EP231S: PFAS Surrogate	ET2101593-055	0229_MW124_210331	13C4-PFOS	----	476 %	65.0-140 %	Recovery greater than upper data quality objective
EP231S: PFAS Surrogate	ET2101593-039	0229_MW217_210331	13C8-PFOA	----	221 %	71.0-133 %	Recovery greater than upper data quality objective
EP231S: PFAS Surrogate	ET2101593-055	0229_MW124_210331	13C8-PFOA	----	502 %	71.0-133 %	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: **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) 0229_SD220_210401, 0229_SD132_210401	0229_SD134_210401,	01-Apr-2021	----	----	----	07-Apr-2021	15-Apr-2021	✓
EP231A: Perfluoroalkyl Sulfonic Acids								
HDPE Soil Jar (EP231X) 0229_SD220_210401, 0229_SD132_210401	0229_SD134_210401,	01-Apr-2021	07-Apr-2021	28-Sep-2021	✓	08-Apr-2021	17-May-2021	✓
EP231B: Perfluoroalkyl Carboxylic Acids								
HDPE Soil Jar (EP231X) 0229_SD220_210401, 0229_SD132_210401	0229_SD134_210401,	01-Apr-2021	07-Apr-2021	28-Sep-2021	✓	08-Apr-2021	17-May-2021	✓
EP231C: Perfluoroalkyl Sulfonamides								
HDPE Soil Jar (EP231X) 0229_SD220_210401, 0229_SD132_210401	0229_SD134_210401,	01-Apr-2021	07-Apr-2021	28-Sep-2021	✓	08-Apr-2021	17-May-2021	✓



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) 0229_SD220_210401, 0229_SD132_210401	0229_SD134_210401,	01-Apr-2021	07-Apr-2021	28-Sep-2021	✓	08-Apr-2021	17-May-2021	✓
EP231P: PFAS Sums								
HDPE Soil Jar (EP231X) 0229_SD220_210401, 0229_SD132_210401	0229_SD134_210401,	01-Apr-2021	07-Apr-2021	28-Sep-2021	✓	08-Apr-2021	17-May-2021	✓

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	
EP231A: Perfluoroalkyl Sulfonic Acids								
HDPE (no PTFE) (EP231X) 0229_SW220_210401, 0229_SW134_210401, 0229_QC305_210401	0229_MW220S_210401, 0229_SW132_210401,	01-Apr-2021	12-Apr-2021	28-Sep-2021	✓	12-Apr-2021	28-Sep-2021	✓
HDPE (no PTFE) (EP231X) 0229_QC301_210329		29-Mar-2021	09-Apr-2021	25-Sep-2021	✓	09-Apr-2021	25-Sep-2021	✓
HDPE (no PTFE) (EP231X) 0229_MW119_210330,	0229_MW118_210330	30-Mar-2021	09-Apr-2021	26-Sep-2021	✓	12-Apr-2021	26-Sep-2021	✓
HDPE (no PTFE) (EP231X) 0229_MW117S_210330, 0229_MW117D_210330	0229_QC302_210330,	30-Mar-2021	12-Apr-2021	26-Sep-2021	✓	12-Apr-2021	26-Sep-2021	✓
HDPE (no PTFE) (EP231X) 0229_MW121_210331, 0229_MW135_210331, 0229_MW102_210331, 0229_QC502_210331, 0229_QC108_210331, 0229_MW003_210331, 0229_QC303_210331	0229_MW018_210331, 0229_MW141_210331, 0229_MW116_210331, 0229_MW125I_210331, 0229_QC109_210331, 0229_QC106_210331,	31-Mar-2021	09-Apr-2021	27-Sep-2021	✓	09-Apr-2021	27-Sep-2021	✓
HDPE (no PTFE) (EP231X) 0229_MW125S_210331, 0229_QC107_210331, 0229_MW233_210331, 0229_QC304_210331, 0229_MW232_210331	0229_MW205S_210331, 0229_MW065_210331, 0229_MW123I_210331, 0229_MW123S_210331,	31-Mar-2021	09-Apr-2021	27-Sep-2021	✓	12-Apr-2021	27-Sep-2021	✓
HDPE (no PTFE) (EP231X) 0229_MW002_210331, 0229_MW139_210331, 0229_MW106_210331, 0229_MW138_210331, 0229_MW128_210331, 0229_MW115_210331, 0229_MW212_210331	0229_MW114_210331, 0229_MW120_210331, 0229_MW072_210331, 0229_MW131_210331, 0229_MW105_210331, 0229_MW074_210331,	31-Mar-2021	13-Apr-2021	27-Sep-2021	✓	13-Apr-2021	27-Sep-2021	✓
HDPE (no PTFE) (EP231X-INJ) 0229_MW101_210331, 0229_MW122_210331, 0229_MW235S_210331,	0229_MW236S_210331, 0229_MW217_210331, 0229_MW124_210331	31-Mar-2021	14-Apr-2021	27-Sep-2021	✓	14-Apr-2021	27-Sep-2021	✓



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) 0229_SW220_210401, 0229_SW134_210401, 0229_QC305_210401	0229_MW220S_210401, 0229_SW132_210401,	01-Apr-2021	12-Apr-2021	28-Sep-2021	✓	12-Apr-2021	28-Sep-2021	✓
HDPE (no PTFE) (EP231X) 0229_QC301_210329		29-Mar-2021	09-Apr-2021	25-Sep-2021	✓	09-Apr-2021	25-Sep-2021	✓
HDPE (no PTFE) (EP231X) 0229_MW119_210330,	0229_MW118_210330	30-Mar-2021	09-Apr-2021	26-Sep-2021	✓	12-Apr-2021	26-Sep-2021	✓
HDPE (no PTFE) (EP231X) 0229_MW117S_210330, 0229_MW117D_210330	0229_QC302_210330,	30-Mar-2021	12-Apr-2021	26-Sep-2021	✓	12-Apr-2021	26-Sep-2021	✓
HDPE (no PTFE) (EP231X) 0229_MW121_210331, 0229_MW135_210331, 0229_MW102_210331, 0229_QC502_210331, 0229_QC108_210331, 0229_MW003_210331, 0229_QC303_210331	0229_MW018_210331, 0229_MW141_210331, 0229_MW116_210331, 0229_MW125I_210331, 0229_QC109_210331, 0229_QC106_210331,	31-Mar-2021	09-Apr-2021	27-Sep-2021	✓	09-Apr-2021	27-Sep-2021	✓
HDPE (no PTFE) (EP231X) 0229_MW125S_210331, 0229_QC107_210331, 0229_MW233_210331, 0229_QC304_210331, 0229_MW232_210331	0229_MW205S_210331, 0229_MW065_210331, 0229_MW123I_210331, 0229_MW123S_210331,	31-Mar-2021	09-Apr-2021	27-Sep-2021	✓	12-Apr-2021	27-Sep-2021	✓
HDPE (no PTFE) (EP231X) 0229_MW002_210331, 0229_MW139_210331, 0229_MW106_210331, 0229_MW138_210331, 0229_MW128_210331, 0229_MW115_210331, 0229_MW212_210331	0229_MW114_210331, 0229_MW120_210331, 0229_MW072_210331, 0229_MW131_210331, 0229_MW105_210331, 0229_MW074_210331,	31-Mar-2021	13-Apr-2021	27-Sep-2021	✓	13-Apr-2021	27-Sep-2021	✓
HDPE (no PTFE) (EP231X-INJ) 0229_MW101_210331, 0229_MW122_210331, 0229_MW235S_210331,	0229_MW236S_210331, 0229_MW217_210331, 0229_MW124_210331	31-Mar-2021	14-Apr-2021	27-Sep-2021	✓	14-Apr-2021	27-Sep-2021	✓



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) 0229_SW220_210401, 0229_SW134_210401, 0229_QC305_210401	0229_MW220S_210401, 0229_SW132_210401,	01-Apr-2021	12-Apr-2021	28-Sep-2021	✓	12-Apr-2021	28-Sep-2021	✓
HDPE (no PTFE) (EP231X) 0229_QC301_210329		29-Mar-2021	09-Apr-2021	25-Sep-2021	✓	09-Apr-2021	25-Sep-2021	✓
HDPE (no PTFE) (EP231X) 0229_MW119_210330,	0229_MW118_210330	30-Mar-2021	09-Apr-2021	26-Sep-2021	✓	12-Apr-2021	26-Sep-2021	✓
HDPE (no PTFE) (EP231X) 0229_MW117S_210330, 0229_MW117D_210330	0229_QC302_210330,	30-Mar-2021	12-Apr-2021	26-Sep-2021	✓	12-Apr-2021	26-Sep-2021	✓
HDPE (no PTFE) (EP231X) 0229_MW121_210331, 0229_MW135_210331, 0229_MW102_210331, 0229_QC502_210331, 0229_QC108_210331, 0229_MW003_210331, 0229_QC303_210331	0229_MW018_210331, 0229_MW141_210331, 0229_MW116_210331, 0229_MW125I_210331, 0229_QC109_210331, 0229_QC106_210331,	31-Mar-2021	09-Apr-2021	27-Sep-2021	✓	09-Apr-2021	27-Sep-2021	✓
HDPE (no PTFE) (EP231X) 0229_MW125S_210331, 0229_QC107_210331, 0229_MW233_210331, 0229_QC304_210331, 0229_MW232_210331	0229_MW205S_210331, 0229_MW065_210331, 0229_MW123I_210331, 0229_MW123S_210331,	31-Mar-2021	09-Apr-2021	27-Sep-2021	✓	12-Apr-2021	27-Sep-2021	✓
HDPE (no PTFE) (EP231X) 0229_MW002_210331, 0229_MW139_210331, 0229_MW106_210331, 0229_MW138_210331, 0229_MW128_210331, 0229_MW115_210331, 0229_MW212_210331	0229_MW114_210331, 0229_MW120_210331, 0229_MW072_210331, 0229_MW131_210331, 0229_MW105_210331, 0229_MW074_210331,	31-Mar-2021	13-Apr-2021	27-Sep-2021	✓	13-Apr-2021	27-Sep-2021	✓
HDPE (no PTFE) (EP231X-INJ) 0229_MW101_210331, 0229_MW122_210331, 0229_MW235S_210331,	0229_MW236S_210331, 0229_MW217_210331, 0229_MW124_210331	31-Mar-2021	14-Apr-2021	27-Sep-2021	✓	14-Apr-2021	27-Sep-2021	✓



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) 0229_SW220_210401, 0229_SW134_210401, 0229_QC305_210401	0229_MW220S_210401, 0229_SW132_210401,	01-Apr-2021	12-Apr-2021	28-Sep-2021	✓	12-Apr-2021	28-Sep-2021	✓
HDPE (no PTFE) (EP231X) 0229_QC301_210329		29-Mar-2021	09-Apr-2021	25-Sep-2021	✓	09-Apr-2021	25-Sep-2021	✓
HDPE (no PTFE) (EP231X) 0229_MW119_210330,	0229_MW118_210330	30-Mar-2021	09-Apr-2021	26-Sep-2021	✓	12-Apr-2021	26-Sep-2021	✓
HDPE (no PTFE) (EP231X) 0229_MW117S_210330, 0229_MW117D_210330	0229_QC302_210330,	30-Mar-2021	12-Apr-2021	26-Sep-2021	✓	12-Apr-2021	26-Sep-2021	✓
HDPE (no PTFE) (EP231X) 0229_MW121_210331, 0229_MW135_210331, 0229_MW102_210331, 0229_QC502_210331, 0229_QC108_210331, 0229_MW003_210331, 0229_QC303_210331	0229_MW018_210331, 0229_MW141_210331, 0229_MW116_210331, 0229_MW125I_210331, 0229_QC109_210331, 0229_QC106_210331,	31-Mar-2021	09-Apr-2021	27-Sep-2021	✓	09-Apr-2021	27-Sep-2021	✓
HDPE (no PTFE) (EP231X) 0229_MW125S_210331, 0229_QC107_210331, 0229_MW233_210331, 0229_QC304_210331, 0229_MW232_210331	0229_MW205S_210331, 0229_MW065_210331, 0229_MW123I_210331, 0229_MW123S_210331,	31-Mar-2021	09-Apr-2021	27-Sep-2021	✓	12-Apr-2021	27-Sep-2021	✓
HDPE (no PTFE) (EP231X) 0229_MW002_210331, 0229_MW139_210331, 0229_MW106_210331, 0229_MW138_210331, 0229_MW128_210331, 0229_MW115_210331, 0229_MW212_210331	0229_MW114_210331, 0229_MW120_210331, 0229_MW072_210331, 0229_MW131_210331, 0229_MW105_210331, 0229_MW074_210331,	31-Mar-2021	13-Apr-2021	27-Sep-2021	✓	13-Apr-2021	27-Sep-2021	✓
HDPE (no PTFE) (EP231X-INJ) 0229_MW101_210331, 0229_MW122_210331, 0229_MW235S_210331,	0229_MW236S_210331, 0229_MW217_210331, 0229_MW124_210331	31-Mar-2021	14-Apr-2021	27-Sep-2021	✓	14-Apr-2021	27-Sep-2021	✓



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) 0229_SW220_210401, 0229_SW134_210401, 0229_QC305_210401	0229_MW220S_210401, 0229_SW132_210401,	01-Apr-2021	12-Apr-2021	28-Sep-2021	✓	12-Apr-2021	28-Sep-2021	✓
HDPE (no PTFE) (EP231X) 0229_QC301_210329		29-Mar-2021	09-Apr-2021	25-Sep-2021	✓	09-Apr-2021	25-Sep-2021	✓
HDPE (no PTFE) (EP231X) 0229_MW119_210330,	0229_MW118_210330	30-Mar-2021	09-Apr-2021	26-Sep-2021	✓	12-Apr-2021	26-Sep-2021	✓
HDPE (no PTFE) (EP231X) 0229_MW117S_210330, 0229_MW117D_210330	0229_QC302_210330,	30-Mar-2021	12-Apr-2021	26-Sep-2021	✓	12-Apr-2021	26-Sep-2021	✓
HDPE (no PTFE) (EP231X) 0229_MW121_210331, 0229_MW135_210331, 0229_MW102_210331, 0229_QC502_210331, 0229_QC108_210331, 0229_MW003_210331, 0229_QC303_210331	0229_MW018_210331, 0229_MW141_210331, 0229_MW116_210331, 0229_MW125I_210331, 0229_QC109_210331, 0229_QC106_210331,	31-Mar-2021	09-Apr-2021	27-Sep-2021	✓	09-Apr-2021	27-Sep-2021	✓
HDPE (no PTFE) (EP231X) 0229_MW125S_210331, 0229_QC107_210331, 0229_MW233_210331, 0229_QC304_210331, 0229_MW232_210331	0229_MW205S_210331, 0229_MW065_210331, 0229_MW123I_210331, 0229_MW123S_210331,	31-Mar-2021	09-Apr-2021	27-Sep-2021	✓	12-Apr-2021	27-Sep-2021	✓
HDPE (no PTFE) (EP231X) 0229_MW002_210331, 0229_MW139_210331, 0229_MW106_210331, 0229_MW138_210331, 0229_MW128_210331, 0229_MW115_210331, 0229_MW212_210331	0229_MW114_210331, 0229_MW120_210331, 0229_MW072_210331, 0229_MW131_210331, 0229_MW105_210331, 0229_MW074_210331,	31-Mar-2021	13-Apr-2021	27-Sep-2021	✓	13-Apr-2021	27-Sep-2021	✓
HDPE (no PTFE) (EP231X-INJ) 0229_MW101_210331, 0229_MW122_210331, 0229_MW235S_210331,	0229_MW236S_210331, 0229_MW217_210331, 0229_MW124_210331	31-Mar-2021	14-Apr-2021	27-Sep-2021	✓	14-Apr-2021	27-Sep-2021	✓



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	Method	Count		Rate (%)			Quality Control Specification
		QC	Regular	Actual	Expected	Evaluation	
Analytical Methods							
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	1	8	12.50	10.00	✔	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	8	12.50	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	8	12.50	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	8	12.50	5.00	✔	NEPM 2013 B3 & ALS QC Standard

Matrix: WATER

Evaluation: ✖ = Quality Control frequency not within specification ; ✔ = Quality Control frequency within specification.

Quality Control Sample Type	Method	Count		Rate (%)			Quality Control Specification
		QC	Regular	Actual	Expected	Evaluation	
Analytical Methods							
Laboratory Duplicates (DUP)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	6	54	11.11	10.00	✔	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X-INJ	1	6	16.67	10.00	✔	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	4	54	7.41	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X-INJ	1	6	16.67	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	4	54	7.41	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X-INJ	1	6	16.67	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	3	54	5.56	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X-INJ	1	6	16.67	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.
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.
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X-INJ	WATER	In house: Direct injection analysis of fresh waters after dilution (1:1) with mobile phase solvent. Analysis by LC-Electrospray-MS-MS, Negative Mode using MRM. Where commercially available, isotopically labelled analogues of the target analytes are used as internal standards for quantification. Where a labelled analogue is not commercially available, the internal standard with similar chemistry and the closest retention time to the target is used for quantification. 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.
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.
Preparation for PFAS in water.	EP231-PR	WATER	Method presumes direct injection without workup. Preparation includes addition of internal standard and surrogate, and filtration prior to analysis.
Solid Phase Extraction (SPE) for PFAS in water	ORG72	WATER	In-house: Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to the sample container. The entire contents are transferred to a solid phase extraction (SPE) cartridge. The sample container is successively rinsed with aliquots of the elution solvent. The eluted extract is combined with an equal volume of reagent water and a portion is filtered for analysis. Method procedures conform to US DoD QSM 5.3, table B-15 requirements.



SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : ET2101593

Client : AECOM Australia Pty Ltd
Contact Address
E-mail
Telephone
Facsimile
Project : QLD_0229_PFASOMP_20
Order number
C-O-C number : 20924
Site : QLD_0229
Sampler
Laboratory : Environmental Division Townsville
Contact Address
E-mail
Telephone
Facsimile
Page : 1 of 4
Quote number : ET2021AECOMAU0001 (TV/007/21 - Compass)
QC Level : NEPM 2013 B3 & ALS QC Standard

Dates

Date Samples Received : 01-Apr-2021 11:55
Client Requested Due Date : 14-Apr-2021
Issue Date : 06-Apr-2021
Scheduled Reporting Date : 14-Apr-2021

Delivery Details

Mode of Delivery : Client Drop Off
No. of coolers/boxes : 1
Receipt Detail : ESKY
Security Seal : Not Available
Temperature : 14.5°C - Ice present
No. of samples received / analysed : 55 / 55

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 be advised that for some samples with extra analysis added in Compass, they have been logged as per bottles received.
6.4.21: SRN has been resent to acknowledge changes in sampling dates as per sample IDs. For any further information regarding these adjustments please contact client services at
Discounted Package Prices apply only when specific ALS Group Codes ('W', 'S', 'NT' suites) are referenced on COCs.
Please direct any turn around / technical queries to the laboratory contact designated above.
Sample Disposal - Aqueous (3 weeks), Solid (2 months ± 1 week) from receipt of samples.
Breaches in recommended extraction / analysis holding times (if any) are displayed overleaf in the Proactive Holding Time Report table.
All analysis will be conducted by ALS Environmental, Brisbane, NATA accreditation no. 825, Site No. 818.
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)
ET2101593-047	01-Apr-2021 07:41	0229_SD220_210401	✓	✓
ET2101593-050	01-Apr-2021 09:19	0229_SD134_210401	✓	✓
ET2101593-052	01-Apr-2021 09:37	0229_SD132_210401	✓	✓

Matrix: **WATER**

Laboratory sample ID	Sampling date / time	Sample ID	WATER - EP231X PFAS - Full Suite (28 analytes)
ET2101593-001	31-Mar-2021 16:16	0229_MW002_210331	✓
ET2101593-002	31-Mar-2021 16:17	0229_MW114_210331	✓
ET2101593-003	31-Mar-2021 16:18	0229_MW139_210331	✓
ET2101593-004	31-Mar-2021 16:19	0229_MW120_210331	✓
ET2101593-005	31-Mar-2021 16:20	0229_MW106_210331	✓
ET2101593-006	31-Mar-2021 16:21	0229_MW072_210331	✓
ET2101593-007	31-Mar-2021 16:22	0229_MW138_210331	✓
ET2101593-008	31-Mar-2021 16:22	0229_MW131_210331	✓
ET2101593-009	31-Mar-2021 16:23	0229_MW128_210331	✓
ET2101593-010	31-Mar-2021 16:24	0229_MW101_210331	✓
ET2101593-011	31-Mar-2021 16:25	0229_MW105_210331	✓
ET2101593-012	31-Mar-2021 16:26	0229_MW115_210331	✓
ET2101593-013	31-Mar-2021 16:27	0229_MW074_210331	✓
ET2101593-014	31-Mar-2021 16:28	0229_MW121_210331	✓
ET2101593-015	31-Mar-2021 16:28	0229_MW018_210331	✓
ET2101593-016	31-Mar-2021 16:29	0229_MW135_210331	✓
ET2101593-017	31-Mar-2021 16:31	0229_MW141_210331	✓
ET2101593-018	31-Mar-2021 16:33	0229_MW102_210331	✓
ET2101593-019	31-Mar-2021 16:34	0229_MW116_210331	✓
ET2101593-020	31-Mar-2021 16:35	0229_QC502_210331	✓



WATER - EP231X
PFAS - Full Suite (28 analytes)

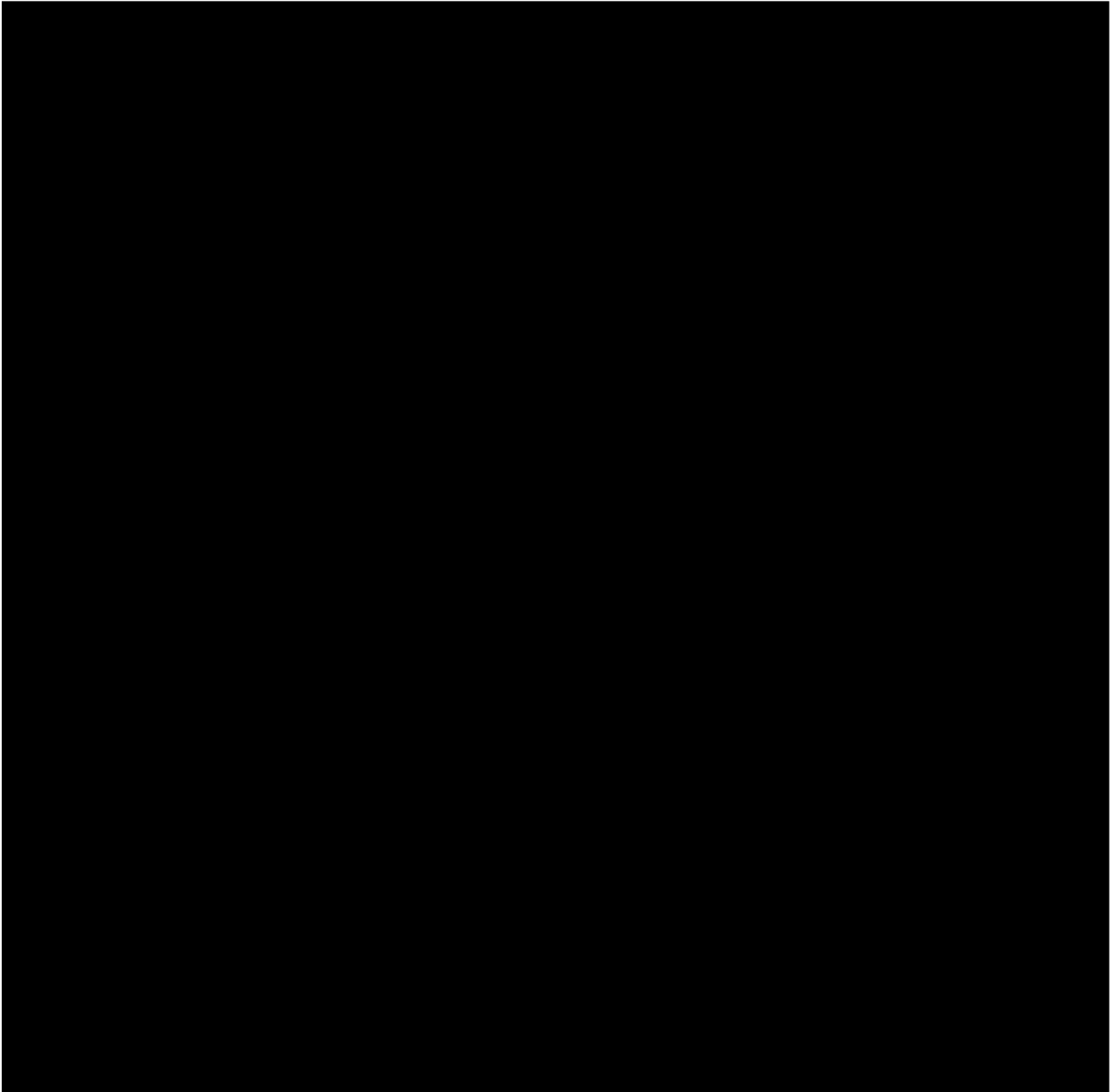
ET2101593-021	31-Mar-2021 16:34	0229_MW125I_210331	✓
ET2101593-022	31-Mar-2021 16:37	0229_QC108_210331	✓
ET2101593-023	31-Mar-2021 16:38	0229_QC109_210331	✓
ET2101593-024	31-Mar-2021 16:37	0229_MW003_210331	✓
ET2101593-025	31-Mar-2021 16:39	0229_QC106_210331	✓
ET2101593-026	31-Mar-2021 16:41	0229_MW212_210331	✓
ET2101593-027	31-Mar-2021 16:41	0229_QC303_210331	✓
ET2101593-028	29-Mar-2021 16:42	0229_QC301_210329	✓
ET2101593-029	31-Mar-2021 16:45	0229_MW125S_210331	✓
ET2101593-030	31-Mar-2021 16:47	0229_MW205S_210331	✓
ET2101593-031	31-Mar-2021 16:49	0229_QC107_210331	✓
ET2101593-032	31-Mar-2021 16:49	0229_MW065_210331	✓
ET2101593-033	31-Mar-2021 16:50	0229_MW233_210331	✓
ET2101593-034	31-Mar-2021 16:52	0229_MW123I_210331	✓
ET2101593-035	31-Mar-2021 16:50	0229_QC304_210331	✓
ET2101593-036	31-Mar-2021 16:52	0229_MW236S_210331	✓
ET2101593-037	31-Mar-2021 16:53	0229_MW123S_210331	✓
ET2101593-038	31-Mar-2021 16:53	0229_MW122_210331	✓
ET2101593-039	31-Mar-2021 16:54	0229_MW217_210331	✓
ET2101593-040	31-Mar-2021 16:55	0229_MW225S_210331	✓
ET2101593-041	31-Mar-2021 16:55	0229_MW232_210331	✓
ET2101593-042	30-Mar-2021 16:56	0229_MW119_210330	✓
ET2101593-043	30-Mar-2021 16:58	0229_MW118_210330	✓
ET2101593-044	30-Mar-2021 16:58	0229_MW117S_210330	✓
ET2101593-045	30-Mar-2021 17:01	0229_QC302_210330	✓
ET2101593-046	01-Apr-2021 07:40	0229_SW220_210401	✓
ET2101593-048	01-Apr-2021 07:52	0229_MW220S_210401	✓
ET2101593-049	01-Apr-2021 09:17	0229_SW134_210401	✓
ET2101593-051	01-Apr-2021 09:36	0229_SW132_210401	✓
ET2101593-053	01-Apr-2021 11:20	0229_QC305_210401	✓
ET2101593-054	30-Mar-2021 11:38	0229_MW117D_210330	✓
ET2101593-055	31-Mar-2021 11:40	0229_MW124_210331	✓

Proactive Holding Time Report

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



Requested Deliverables





CERTIFICATE OF ANALYSIS

Work Order : ET2101594
Client : AECOM Australia Pty Ltd
Contact : [Redacted]
Address : [Redacted]
Telephone : [Redacted]
Project : QLD_0229_PFASOMP_20
Order number : -
C-O-C number : 20928
Sampler : [Redacted]
Site : QLD_0229
Quote number : TV/007/21 - Compass
No. of samples received : 1
No. of samples analysed : 1

Page : 1 of 5
Laboratory : Environmental Division Townsville
Contact : [Redacted]
Address : [Redacted]
Telephone : [Redacted]
Date Samples Received : 01-Apr-2021 11:55
Date Analysis Commenced : 09-Apr-2021
Issue Date : 12-Apr-2021 17:35



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.

Table with 3 columns: Signatories, Position, Accreditation Category. All rows are redacted.



General Comments

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

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

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

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

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

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contact 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.
- All analysis will be conducted by ALS Environmental, Brisbane, NATA accreditation no. 825, Site No. 818.
- 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.
- EP231: Stable isotope enriched internal standards are added to samples prior to extraction. Target compounds have a direct analogous internal standard with the exception of PFPeS, PFHpA, PFDS, PFTrDA and 10:2 FTS. These compounds use an internal standard that is chemically related and has a retention time close to that of the target compound. The DQO for internal standard response is 50-150% of that established at initial calibration. PFOS is quantified using a certified, traceable standard consisting of linear and branched PFOS isomers. These practices are in line with recommendations in the National Environmental Management Plan for PFAS (Australian HEPA) and also conform to QSM 5.3 (US DoD) requirements.



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)		Sample ID		0229_MW226_210330	----	----	----	----
Sampling date / time		30-Mar-2021 07:47		----	----	----	----	----
Compound	CAS Number	LOR	Unit	ET2101594-001	-----	-----	-----	-----
				Result	----	----	----	----
EP231A: Perfluoroalkyl Sulfonic Acids								
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	0.03	----	----	----	----
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	----	----	----	----
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.02	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	0.03	----	----	----	----
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	----	----	----	----
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	----	----	----	----



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)		Sample ID	0229_MW226_210330	----	----	----	----
		Sampling date / time	30-Mar-2021 07:47	----	----	----	----
Compound	CAS Number	LOR	Unit	ET2101594-001	-----	-----	-----
				Result	----	----	----
EP231C: Perfluoroalkyl Sulfonamides - Continued							
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	0.11	----	----	----
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	0.08	----	----	----
Sum of PFAS (WA DER List)	----	0.01	µg/L	0.11	----	----	----
EP231S: PFAS Surrogate							
13C4-PFOS	----	0.02	%	102	----	----	----
13C8-PFOA	----	0.02	%	102	----	----	----



Surrogate Control Limits

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

Inter-Laboratory Testing

Analysis conducted by ALS Brisbane, NATA accreditation no. 825, site no. 818 (Chemistry) 18958 (Biology).

(WATER) EP231A: Perfluoroalkyl Sulfonic Acids

(WATER) EP231B: Perfluoroalkyl Carboxylic Acids

(WATER) EP231C: Perfluoroalkyl Sulfonamides

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

(WATER) EP231P: PFAS Sums

(WATER) EP231S: PFAS Surrogate



QUALITY CONTROL REPORT

Work Order : ET2101594

Page : 1 of 5

Client : AECOM Australia Pty Ltd

Laboratory : Environmental Division Townsville

Contact Address [Redacted]

Contact Address [Redacted]

Telephone [Redacted]

Telephone [Redacted]

Project : QLD_0229_PFASOMP_20

Date Samples Received : 01-Apr-2021

Order number : -

Date Analysis Commenced : 09-Apr-2021

C-O-C number : 20928

Issue Date : 12-Apr-2021

Sampler [Redacted]

Site : QLD_0229

Quote number : TV/007/21 - Compass

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]

[Redacted]



General Comments

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

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

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

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: 3609524)									
EB2108783-006	Anonymous	EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	<0.01	0.00	No Limit
		EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	<0.02	0.00	No Limit
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 3609524)									
EB2108783-006	Anonymous	EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	<0.01	0.00	No Limit
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	<0.05	0.00	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	<0.1	0.00	No Limit
		EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 3609524)							
EB2108783-006	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	<0.02	0.00	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: 3609524) - continued									
EB2108783-006	Anonymous	EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	<0.05	0.00	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	<0.05	0.00	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	<0.05	0.00	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	<0.05	0.00	No Limit
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 3609524)									
EB2108783-006	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	<0.05	0.00	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	<0.05	0.00	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	<0.05	0.00	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	<0.05	0.00	No Limit
EP231P: PFAS Sums (QC Lot: 3609524)									
EB2108783-006	Anonymous	EP231X: Sum of PFAS	----	0.01	µg/L	<0.01	<0.01	0.00	No Limit
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	<0.01	<0.01	0.00	No Limit
		EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	<0.01	<0.01	0.00	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: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
				Result	Spike Concentration	Spike Recovery (%)	Acceptable Limits (%)	
						LCS	Low	High
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 3609524)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.2218 µg/L	90.4	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	0.02	µg/L	<0.02	0.2373 µg/L	89.3	68.0	131
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.238 µg/L	96.6	69.0	134
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.232 µg/L	103	65.0	140
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.241 µg/L	110	53.0	142
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 3609524)								
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	106	72.0	129
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	0.25 µg/L	95.6	72.0	129
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	0.25 µg/L	104	72.0	130
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	0.25 µg/L	101	71.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	0.25 µg/L	98.4	69.0	130
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	0.25 µg/L	93.8	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	96.2	72.0	134
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	0.25 µg/L	96.6	65.0	144
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	0.625 µg/L	83.0	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 3609524)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.25 µg/L	109	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	0.625 µg/L	106	68.0	141
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	0.625 µg/L	91.6	60.5	138
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	0.625 µg/L	87.0	68.3	134
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	0.625 µg/L	112	62.6	138
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	0.25 µg/L	93.2	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
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 3609524)								
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	93.8	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



Sub-Matrix: WATER

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report Result	Laboratory Control Spike (LCS) Report				
					Spike Concentration	Spike Recovery (%)		Acceptable Limits (%)	
						LCS	Low	High	
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 3609524) - continued									
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: 3609524)									
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	: ET2101594	Page	: 1 of 4
Client	: AECOM Australia Pty Ltd	Laboratory	: Environmental Division Townsville
Contact	: [REDACTED]	Telephone	: [REDACTED]
Project	: QLD_0229_PFASOMP_20	Date Samples Received	: 01-Apr-2021
Site	: QLD_0229	Issue Date	: 12-Apr-2021
Sampler	: [REDACTED]	No. of samples received	: 1
Order number	: -	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

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



Outliers : Frequency of Quality Control Samples

Matrix: **WATER**

Quality Control Sample Type Method	Count		Rate (%)		Quality Control Specification
	QC	Regular	Actual	Expected	
Matrix Spikes (MS)					
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	0	4	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) 0229_MW226_210330	30-Mar-2021	09-Apr-2021	26-Sep-2021	✓	09-Apr-2021	26-Sep-2021	✓
EP231B: Perfluoroalkyl Carboxylic Acids							
HDPE (no PTFE) (EP231X) 0229_MW226_210330	30-Mar-2021	09-Apr-2021	26-Sep-2021	✓	09-Apr-2021	26-Sep-2021	✓
EP231C: Perfluoroalkyl Sulfonamides							
HDPE (no PTFE) (EP231X) 0229_MW226_210330	30-Mar-2021	09-Apr-2021	26-Sep-2021	✓	09-Apr-2021	26-Sep-2021	✓
EP231D: (n:2) Fluorotelomer Sulfonic Acids							
HDPE (no PTFE) (EP231X) 0229_MW226_210330	30-Mar-2021	09-Apr-2021	26-Sep-2021	✓	09-Apr-2021	26-Sep-2021	✓
EP231P: PFAS Sums							
HDPE (no PTFE) (EP231X) 0229_MW226_210330	30-Mar-2021	09-Apr-2021	26-Sep-2021	✓	09-Apr-2021	26-Sep-2021	✓



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	Method	Count		Rate (%)			Quality Control Specification
		QC	Reaular	Actual	Expected	Evaluation	
Analytical Methods							
Laboratory Duplicates (DUP)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	4	25.00	10.00	✔	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	4	25.00	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	4	25.00	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	0	4	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.

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



SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : ET2101594

Client : AECOM Australia Pty Ltd

Contact Address [Redacted]

Laboratory : Environmental Division Townsville

Contact Address [Redacted]

E-mail Telephone Facsimile [Redacted]

E-mail Telephone Facsimile [Redacted]

Project : QLD_0229_PFASOMP_20
Order number : -

Page : 1 of 3
Quote number : ET2021AECOMAU0001 (TV/007/21 - Compass)

C-O-C number : 20928

QC Level : NEPM 2013 B3 & ALS QC Standard

Site : QLD_0229
Sampler [Redacted]

Dates

Date Samples Received : 01-Apr-2021 11:55
Client Requested Due Date : 13-Apr-2021

Issue Date : 06-Apr-2021
Scheduled Reporting Date : 13-Apr-2021

Delivery Details

Mode of Delivery : Client Drop Off
No. of coolers/boxes : 1
Receipt Detail : ESKY

Security Seal : Not Available
Temperature : 14.5°C - Ice present
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
Discounted Package Prices apply only when specific ALS Group Codes ('W', 'S', 'NT' suites) are referenced on COCs.
Please direct any turn around / technical queries to the laboratory contact designated above.
Sample Disposal - Aqueous (3 weeks), Solid (2 months ± 1 week) from receipt of samples.
Breaches in recommended extraction / analysis holding times (if any) are displayed overleaf in the Proactive Holding Time Report table.
All analysis will be conducted by [Redacted] NATA accreditation no. 825, Site No. 818.
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**

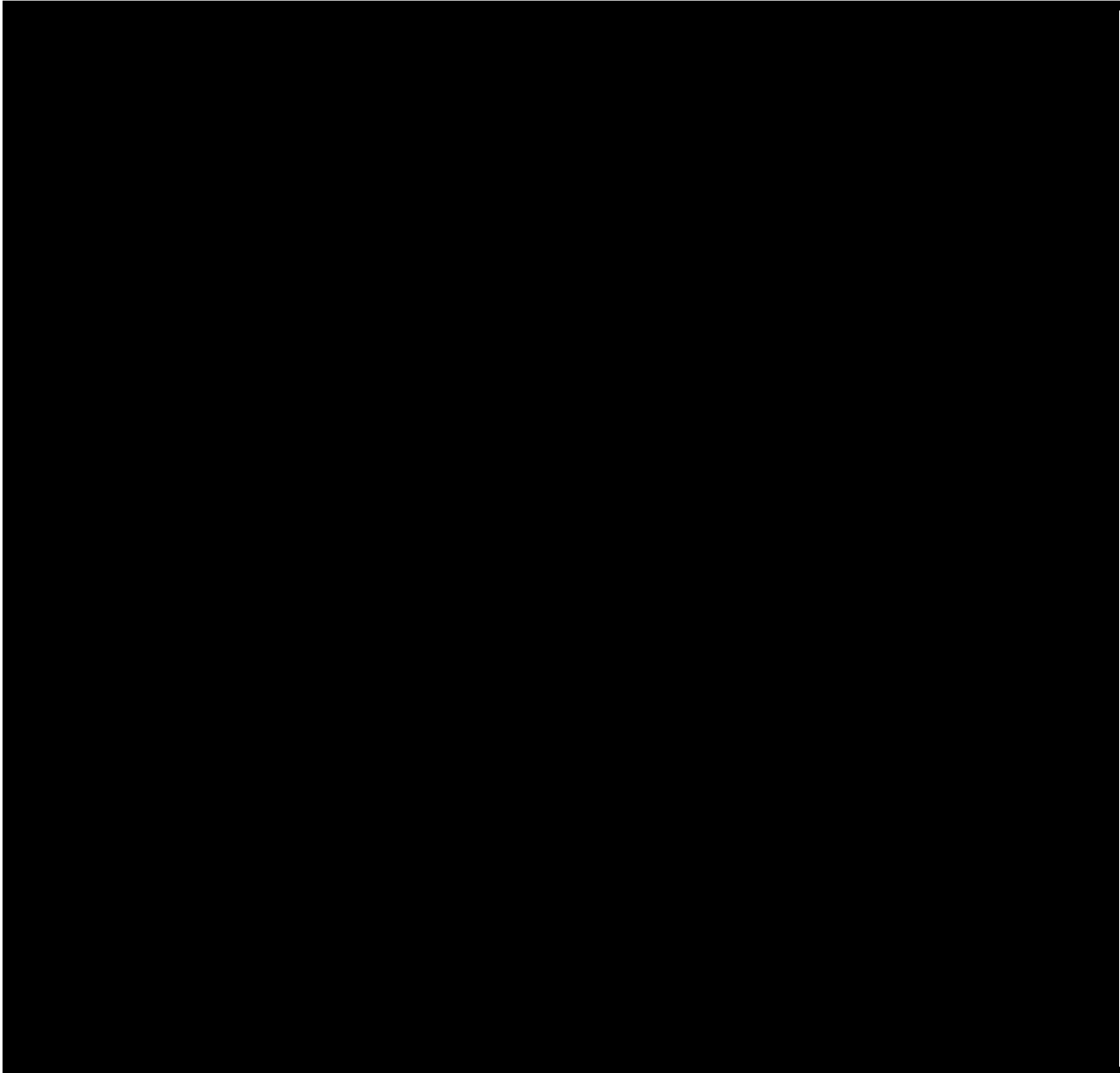
Laboratory sample ID	Sampling date / time	Sample ID	WATER - EP231X PFAS - Full Suite (28 analytes)
ET2101594-001	30-Mar-2021 07:47	0229_MW226_210330	✓

Proactive Holding Time Report

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



Requested Deliverables



CERTIFICATE OF ANALYSIS

Work Order : **ET2101595**
Client : **AECOM Australia Pty Ltd**
Contact : [REDACTED]
Address : [REDACTED]

Telephone : [REDACTED]
Project : QLD_0229_PFASOMP_20
Order number : -
C-O-C number : 20929
Sampler : [REDACTED]
Site : QLD_0229
Quote number : TV/007/21 - Compass
No. of samples received : 4
No. of samples analysed : 4

Page : 1 of 7
Laboratory : Environmental Division Townsville
Contact : [REDACTED]
Address : [REDACTED]

Telephone : [REDACTED]
Date Samples Received : 01-Apr-2021 11:55
Date Analysis Commenced : 07-Apr-2021
Issue Date : 14-Apr-2021 16:58



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.

<i>Signatories</i>	<i>Position</i>	<i>Accreditation Category</i>
[REDACTED]	[REDACTED]	[REDACTED]



General Comments

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

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

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

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

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

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

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

- EP231X - Per- and Polyfluoroalkyl Substances (PFAS): Samples received in 20ml or 125ml bottles have been tested in accordance with the QSM5.3 compliant, NATA accredited method. 60mL or 250mL bottles have been tested to the legacy QSM 5.1 aligned, NATA accredited method.
- EP231X PFAS: The LOR of PFDoDA for sample "0229_SD211_210401" has been raised due to sample matrix interferences.
- EP231X PFAS: Sample '0229_SD211_210401' required dilution due to matrix interference. LOR values have been adjusted accordingly and surrogate recovery not determined.
- All analysis will be conducted by ALS Environmental, Brisbane, NATA accreditation no. 825, Site No. 818.
- 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.
- 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		0229_SD212_210401	0229_SD211_210401	----	----	----
		Sampling date / time		01-Apr-2021 08:41	01-Apr-2021 08:59	----	----	----
Compound	CAS Number	LOR	Unit	ET2101595-002	ET2101595-003	-----	-----	-----
				Result	Result	----	----	----
EA055: Moisture Content (Dried @ 105-110°C)								
Moisture Content	----	0.1	%	25.3	33.2	----	----	----
EP231A: Perfluoroalkyl Sulfonic Acids								
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	<0.0005	----	----	----
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	<0.0005	----	----	----
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	<0.0005	----	----	----
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	<0.0005	----	----	----
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	0.0005	0.0015	----	----	----
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	<0.0005	----	----	----
EP231B: Perfluoroalkyl Carboxylic Acids								
Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	<0.002	----	----	----
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	<0.0005	----	----	----
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	<0.0005	----	----	----
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	<0.0005	----	----	----
Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	<0.0005	----	----	----
Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	<0.0005	----	----	----
Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	<0.0005	----	----	----
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	<0.0005	----	----	----
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	<0.0008	----	----	----
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	<0.0005	----	----	----
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	<0.0012	----	----	----
EP231C: Perfluoroalkyl Sulfonamides								
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	<0.0005	----	----	----
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	<0.0012	----	----	----



Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)				Sample ID	0229_SD212_210401	0229_SD211_210401	----	----	----
Sampling date / time				01-Apr-2021 08:41	01-Apr-2021 08:59	----	----	----	
Compound	CAS Number	LOR	Unit	ET2101595-002	ET2101595-003	-----	-----	-----	
				Result	Result	----	----	----	
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	<0.0012	----	----	----	
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	<0.0012	----	----	----	
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	<0.0012	----	----	----	
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	<0.0005	----	----	----	
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	<0.0005	----	----	----	
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	0.0005	0.0015	----	----	----	
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg	0.0005	0.0015	----	----	----	
Sum of PFAS (WA DER List)	----	0.0002	mg/kg	0.0005	0.0015	----	----	----	
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.0002	%	106	Not Determined	----	----	----	
13C8-PFOA	----	0.0002	%	98.5	Not Determined	----	----	----	



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)		Sample ID		0229_SW212_210401	0229_SW211_210401	----	----	----
		Sampling date / time		01-Apr-2021 08:40	01-Apr-2021 09:01	----	----	----
Compound	CAS Number	LOR	Unit	ET2101595-001	ET2101595-004	-----	-----	-----
				Result	Result	----	----	----
EP231A: Perfluoroalkyl Sulfonic Acids								
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	0.03	0.02	----	----	----
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	<0.02	----	----	----
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.02	µg/L	0.06	<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	0.02	0.03	----	----	----
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	----	----	----
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	<0.05	----	----	----



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)			Sample ID	0229_SW212_210401	0229_SW211_210401	----	----	----
Sampling date / time			01-Apr-2021 08:40	01-Apr-2021 09:01	----	----	----	
Compound	CAS Number	LOR	Unit	ET2101595-001	ET2101595-004	-----	-----	-----
				Result	Result	----	----	----
EP231C: Perfluoroalkyl Sulfonamides - Continued								
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	0.11	0.05	----	----	----
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	0.08	0.03	----	----	----
Sum of PFAS (WA DER List)	----	0.01	µg/L	0.11	0.05	----	----	----
EP231S: PFAS Surrogate								
13C4-PFOS	----	0.02	%	106	106	----	----	----
13C8-PFOA	----	0.02	%	102	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

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

Inter-Laboratory Testing

Analysis conducted by ALS Brisbane, NATA accreditation no. 825, site no. 818 (Chemistry) 18958 (Biology).

- (WATER) EP231A: Perfluoroalkyl Sulfonic Acids
- (WATER) EP231B: Perfluoroalkyl Carboxylic Acids
- (WATER) EP231C: Perfluoroalkyl Sulfonamides
- (WATER) EP231D: (n:2) Fluorotelomer Sulfonic Acids
- (WATER) EP231P: PFAS Sums
- (WATER) EP231S: PFAS Surrogate
- (SOIL) EP231B: Perfluoroalkyl Carboxylic Acids
- (SOIL) EP231D: (n:2) Fluorotelomer Sulfonic Acids
- (SOIL) EP231C: Perfluoroalkyl Sulfonamides
- (SOIL) EP231A: Perfluoroalkyl Sulfonic Acids
- (SOIL) EP231P: PFAS Sums
- (SOIL) EP231S: PFAS Surrogate
- (SOIL) EA055: Moisture Content (Dried @ 105-110°C)



QUALITY CONTROL REPORT

Work Order : ET2101595

Client : AECOM Australia Pty Ltd

Contact : [Redacted]

Address : [Redacted]

Telephone : ----

Project : QLD_0229_PFASOMP_20

Order number : -

C-O-C number : 20929

Sampler : [Redacted]

Site : QLD_0229

Quote number : TV/007/21 - Compass

No. of samples received : 4

No. of samples analysed : 4

Page : 1 of 10

Laboratory : Environmental Division Townsville

Contact : [Redacted]

Address : [Redacted]

Telephone : [Redacted]

Date Samples Received : 01-Apr-2021

Date Analysis Commenced : 07-Apr-2021

Issue Date : 14-Apr-2021



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]	[Redacted]	[Redacted]
[Redacted]	[Redacted]	[Redacted]



General Comments

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

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

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

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: 3606556)									
EB2109226-001	Anonymous	EA055: Moisture Content	----	0.1	%	3.2	3.2	0.00	0% - 20%
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 3606555)									
EB2109226-001	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	<0.0002	0.00	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	<0.0002	0.00	No Limit
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	<0.0002	0.00	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	<0.0002	0.00	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	<0.0002	0.00	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	<0.0002	0.00	No Limit
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 3606555)									
EB2109226-001	Anonymous	EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	<0.0002	0.00	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	<0.0002	0.00	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	<0.0002	0.00	No Limit
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	<0.0002	0.00	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	<0.0002	0.00	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	<0.0002	0.00	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.00	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	<0.0002	0.00	No Limit
		EP231X: Perfluorotridecanoic acid (PFTTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.00	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	<0.0005	0.00	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	<0.001	0.00	No Limit
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 3606555)									
EB2109226-001	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	<0.0002	0.00	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	<0.0002	0.00	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: 3606555) - continued									
EB2109226-001	Anonymous	EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	<0.0002	0.00	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	<0.0005	0.00	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	<0.0005	0.00	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	<0.0005	0.00	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	<0.0005	0.00	No Limit
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 3606555)									
EB2109226-001	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	<0.0005	0.00	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	<0.0005	0.00	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	<0.0005	0.00	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	<0.0005	0.00	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: 3611397)									
ET2101593-046	Anonymous	EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	0.52	0.52	0.00	0% - 20%
		EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	0.12	0.12	0.00	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	0.09	0.09	0.00	No Limit
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.02	µg/L	0.73	0.73	0.00	0% - 20%
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	0.03	0.02	0.00	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	<0.02	0.00	No Limit
ET2101593-051	Anonymous	EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	1.39	1.31	6.21	0% - 20%
		EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	0.24	0.26	6.90	0% - 50%
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	0.20	0.20	0.00	0% - 50%
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.02	µg/L	1.16	1.17	0.00	0% - 20%
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	0.06	0.05	0.00	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	<0.02	0.00	No Limit
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 3611397)									
ET2101593-046	Anonymous	EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	0.02	0.02	0.00	No Limit
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	0.02	0.03	0.00	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	0.14	0.14	0.00	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	<0.02	0.00	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: 3611397) - continued									
ET2101593-046	Anonymous	EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	<0.05	0.00	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	<0.1	0.00	No Limit
ET2101593-051	Anonymous	EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	0.08	0.07	0.00	No Limit
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	0.06	0.06	0.00	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	0.27	0.26	0.00	0% - 50%
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	0.04	0.04	0.00	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	<0.05	0.00	No Limit
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	<0.1	0.00	No Limit		
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 3611397)									
ET2101593-046	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	<0.05	0.00	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	<0.05	0.00	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	<0.05	0.00	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	<0.05	0.00	No Limit
ET2101593-051	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	<0.05	0.00	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	<0.05	0.00	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: 3611397) - continued									
ET2101593-051	Anonymous	EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	<0.05	0.00	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	<0.05	0.00	No Limit
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 3611397)									
ET2101593-046	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	<0.05	0.00	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	<0.05	0.00	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	<0.05	0.00	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	<0.05	0.00	No Limit
ET2101593-051	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	<0.05	0.00	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	<0.05	0.00	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	<0.05	0.00	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	<0.05	0.00	No Limit
EP231P: PFAS Sums (QC Lot: 3611397)									
ET2101593-046	Anonymous	EP231X: Sum of PFAS	----	0.01	µg/L	1.67	1.67	0.00	0% - 20%
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	1.25	1.25	0.00	0% - 20%
		EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	1.55	1.56	0.643	0% - 20%
ET2101593-051	Anonymous	EP231X: Sum of PFAS	----	0.01	µg/L	3.50	3.42	2.31	0% - 20%
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	2.55	2.48	2.78	0% - 20%
		EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	3.24	3.17	2.18	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: **SOIL**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report				
				Result	Spike Concentration	Spike Recovery (%)		Acceptable Limits (%)	
						LCS	Low	High	
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 3606555)									
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	0.00117 mg/kg	94.0	73.0	123	
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	0.00118 mg/kg	95.3	67.0	130	
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	0.00119 mg/kg	96.6	70.0	132	
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	0.00116 mg/kg	97.0	68.0	136	
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	0.0012 mg/kg	105	59.0	134	
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 3606555)									
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	0.00625 mg/kg	84.9	71.0	135	
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	0.00125 mg/kg	98.8	69.0	132	
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	0.00125 mg/kg	85.6	70.0	132	
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	0.00125 mg/kg	97.2	71.0	131	
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	98.8	69.0	133	
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	92.0	72.0	129	
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	0.00125 mg/kg	92.8	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	92.4	69.0	135	
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	92.0	66.0	139	
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	0.00312 mg/kg	92.3	69.0	133	
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 3606555)									
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	0.00125 mg/kg	109	67.0	137	
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	0.00312 mg/kg	95.5	59.6	143	
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	0.00312 mg/kg	93.6	62.8	140	
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	0.00312 mg/kg	87.8	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	137	
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	0.00125 mg/kg	90.4	63.0	144	
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	0.00125 mg/kg	87.2	61.0	139	
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 3606555)									
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	0.00117 mg/kg	108	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	103	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	91.2	65.0	137	



Sub-Matrix: **SOIL**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report Result	Laboratory Control Spike (LCS) Report				
					Spike Concentration	Spike Recovery (%)		Acceptable Limits (%)	
						LCS	Low	High	
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 3606555) - continued									
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	0.0012 mg/kg	95.0	54.8	124	

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report Result	Laboratory Control Spike (LCS) Report				
					Spike Concentration	Spike Recovery (%)		Acceptable Limits (%)	
						LCS	Low	High	
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 3611397)									
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	92.7	71.0	127	
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.02	µg/L	<0.02	0.2373 µg/L	84.9	68.0	131	
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.238 µg/L	88.4	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	97.9	53.0	142	
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 3611397)									
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	1.25 µg/L	82.9	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	84.6	72.0	129	
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	0.25 µg/L	87.4	72.0	130	
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	0.25 µg/L	85.8	71.0	133	
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	0.25 µg/L	83.8	69.0	130	
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	0.25 µg/L	85.6	71.0	129	
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	0.25 µg/L	85.2	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	88.4	65.0	144	
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	0.625 µg/L	92.5	71.0	132	
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 3611397)									
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	92.2	68.0	141	
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	0.625 µg/L	79.8	60.5	138	
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	0.625 µg/L	89.3	68.3	134	
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	0.625 µg/L	93.9	62.6	138	
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	0.25 µg/L	89.8	65.0	136	
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	0.25 µg/L	96.0	61.0	135	
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 3611397)									
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.2343 µg/L	87.9	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	88.5	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 (%)	Acceptable Limits (%)	
						LCS	Low	High
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 3611397) - continued								
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	0.24 µg/L	99.0	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	89.2	64.2	133
EP231P: PFAS Sums (QCLot: 3611397)								
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: SOIL

Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report			
				Spike Concentration	Spike Recovery(%) MS	Low	High
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 3606555)							
EB2109226-002	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0011 mg/kg	95.9	72.0	128
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.00117 mg/kg	94.4	73.0	123
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.00118 mg/kg	100	67.0	130
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.00119 mg/kg	89.1	70.0	132
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.00116 mg/kg	95.7	68.0	136
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0012 mg/kg	103	59.0	134
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 3606555)							
EB2109226-002	Anonymous	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.00625 mg/kg	87.3	71.0	135
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.00125 mg/kg	103	69.0	132
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.00125 mg/kg	84.0	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	98.8	69.0	133
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.00125 mg/kg	90.0	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	96.4	64.0	136
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.00125 mg/kg	88.8	69.0	135
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.00125 mg/kg	92.4	66.0	139
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.00312 mg/kg	88.6	69.0	133
		EP231C: Perfluoroalkyl Sulfonamides (QCLot: 3606555)					
EB2109226-002	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.00125 mg/kg	104	48.0	128
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.00312 mg/kg	101	70.0	130



Sub-Matrix: **SOIL**

				Matrix Spike (MS) Report			
				Spike Concentration	SpikeRecovery(%) MS	Acceptable Limits (%)	
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 3606555) - continued							
EB2109226-002	Anonymous	EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.00312 mg/kg	90.1	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.00312 mg/kg	87.5	70.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.00312 mg/kg	109	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.00125 mg/kg	87.2	63.0	144
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.00125 mg/kg	94.0	61.0	139
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 3606555)							
EB2109226-002	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.00117 mg/kg	109	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	97.5	65.0	137
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0012 mg/kg	94.2	70.0	130

Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike Concentration	SpikeRecovery(%) MS	Acceptable Limits (%)	
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 3611397)							
ET2101593-049	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.2218 µg/L	95.1	72.0	130
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.235 µg/L	109	71.0	127
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.2352 µg/L	90.6	68.0	131
		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	104	65.0	140
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.241 µg/L	104	53.0	142
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 3611397)							
ET2101593-049	Anonymous	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	1.25 µg/L	98.0	73.0	129
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.25 µg/L	96.0	72.0	129
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.25 µg/L	91.1	72.0	129
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.25 µg/L	96.3	72.0	130
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.25 µg/L	87.1	71.0	133
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.25 µg/L	87.9	69.0	130
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.25 µg/L	91.2	71.0	129
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.25 µg/L	92.0	69.0	133
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.25 µg/L	94.4	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	0.625 µg/L	91.0	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 3611397)							
ET2101593-049	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.25 µg/L	82.0	59.0	135



Sub-Matrix: **WATER**

Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report			
				Spike Concentration	Spike Recovery(%) MS	Acceptable Limits (%)	
				Low	High		
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 3611397) - continued							
ET2101593-049	Anonymous	EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.625 µg/L	96.3	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	99.9	70.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.625 µg/L	92.9	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	69.2	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 3611397)							
ET2101593-049	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.234 µg/L	95.9	63.0	143
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.2378 µg/L	110	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.24 µg/L	89.4	67.0	138
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.2415 µg/L	84.8	70.0	130

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: ET2101595	Page	: 1 of 5
Client	: AECOM Australia Pty Ltd	Laboratory	: Environmental Division Townsville
Contact	[REDACTED]	Telephone	[REDACTED]
Project	: QLD_0229_PFASOMP_20	Date Samples Received	: 01-Apr-2021
Site	: QLD_0229	Issue Date	: 14-Apr-2021
Sampler	[REDACTED]	No. of samples received	: 4
Order number	: -	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) 0229_SD212_210401,	0229_SD211_210401	01-Apr-2021	----	----	----	07-Apr-2021	15-Apr-2021	✓
EP231A: Perfluoroalkyl Sulfonic Acids								
HDPE Soil Jar (EP231X) 0229_SD212_210401,	0229_SD211_210401	01-Apr-2021	07-Apr-2021	28-Sep-2021	✓	08-Apr-2021	17-May-2021	✓
EP231B: Perfluoroalkyl Carboxylic Acids								
HDPE Soil Jar (EP231X) 0229_SD212_210401,	0229_SD211_210401	01-Apr-2021	07-Apr-2021	28-Sep-2021	✓	08-Apr-2021	17-May-2021	✓
EP231C: Perfluoroalkyl Sulfonamides								
HDPE Soil Jar (EP231X) 0229_SD212_210401,	0229_SD211_210401	01-Apr-2021	07-Apr-2021	28-Sep-2021	✓	08-Apr-2021	17-May-2021	✓
EP231D: (n:2) Fluorotelomer Sulfonic Acids								
HDPE Soil Jar (EP231X) 0229_SD212_210401,	0229_SD211_210401	01-Apr-2021	07-Apr-2021	28-Sep-2021	✓	08-Apr-2021	17-May-2021	✓
EP231P: PFAS Sums								
HDPE Soil Jar (EP231X) 0229_SD212_210401,	0229_SD211_210401	01-Apr-2021	07-Apr-2021	28-Sep-2021	✓	08-Apr-2021	17-May-2021	✓

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) 0229_SW212_210401,	0229_SW211_210401	01-Apr-2021	12-Apr-2021	28-Sep-2021	✓	12-Apr-2021	28-Sep-2021	✓
EP231B: Perfluoroalkyl Carboxylic Acids								
HDPE (no PTFE) (EP231X) 0229_SW212_210401,	0229_SW211_210401	01-Apr-2021	12-Apr-2021	28-Sep-2021	✓	12-Apr-2021	28-Sep-2021	✓
EP231C: Perfluoroalkyl Sulfonamides								
HDPE (no PTFE) (EP231X) 0229_SW212_210401,	0229_SW211_210401	01-Apr-2021	12-Apr-2021	28-Sep-2021	✓	12-Apr-2021	28-Sep-2021	✓



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) 0229_SW212_210401,	0229_SW211_210401	01-Apr-2021	12-Apr-2021	28-Sep-2021	✓	12-Apr-2021	28-Sep-2021	✓
EP231P: PFAS Sums								
HDPE (no PTFE) (EP231X) 0229_SW212_210401,	0229_SW211_210401	01-Apr-2021	12-Apr-2021	28-Sep-2021	✓	12-Apr-2021	28-Sep-2021	✓



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	Method	Count		Rate (%)			Quality Control Specification
		QC	Regular	Actual	Expected	Evaluation	
Analytical Methods							
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	1	8	12.50	10.00	✔	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	8	12.50	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	8	12.50	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	8	12.50	5.00	✔	NEPM 2013 B3 & ALS QC Standard

Matrix: WATER

Evaluation: ✖ = Quality Control frequency not within specification ; ✔ = Quality Control frequency within specification.

Quality Control Sample Type	Method	Count		Rate (%)			Quality Control Specification
		QC	Regular	Actual	Expected	Evaluation	
Analytical Methods							
Laboratory Duplicates (DUP)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	14	14.29	10.00	✔	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	14	7.14	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	14	7.14	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	14	7.14	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.
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
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.
Solid Phase Extraction (SPE) for PFAS in water	ORG72	WATER	In-house: Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to the sample container. The entire contents are transferred to a solid phase extraction (SPE) cartridge. The sample container is successively rinsed with aliquots of the elution solvent. The eluted extract is combined with an equal volume of reagent water and a portion is filtered for analysis. Method procedures conform to US DoD QSM 5.3, table B-15 requirements.



SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : ET2101595

Client : AECOM Australia Pty Ltd
Contact Address
E-mail
Telephone : ---
Facsimile : ---

Laboratory : Environmental Division Townsville
Contact Address
E-mail
Telephone
Facsimile

Project : QLD_0229_PFASOMP_20
Order number : -
C-O-C number : 20929
Site : QLD_0229
Sampler

Page : 1 of 3
Quote number : ET2021AECOMAU0001 (TV/007/21 - Compass)
QC Level : NEPM 2013 B3 & ALS QC Standard

Dates

Date Samples Received : 01-Apr-2021 11:55
Client Requested Due Date : 14-Apr-2021

Issue Date : 06-Apr-2021
Scheduled Reporting Date : 14-Apr-2021

Delivery Details

Mode of Delivery : Pickup
No. of coolers/boxes : 1
Receipt Detail : ESKY

Security Seal : Not Available
Temperature : 14.5°C - Ice present
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
Discounted Package Prices apply only when specific ALS Group Codes ('W', 'S', 'NT' suites) are referenced on COCs.
Please direct any turn around / technical queries to the laboratory contact designated above.
Sample Disposal - Aqueous (3 weeks), Solid (2 months ± 1 week) from receipt of samples.
Breaches in recommended extraction / analysis holding times (if any) are displayed overleaf in the Proactive Holding Time Report table.
All analysis will be conducted by [redacted] NATA accreditation no. 825, Site No. 818.
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)
ET2101595-002	01-Apr-2021 08:41	0229_SD212_210401	✓	✓
ET2101595-003	01-Apr-2021 08:59	0229_SD211_210401	✓	✓

Matrix: **WATER**

Laboratory sample ID	Sampling date / time	Sample ID	WATER - EP231X PFAS - Full Suite (28 analytes)
ET2101595-001	01-Apr-2021 08:40	0229_SW212_210401	✓
ET2101595-004	01-Apr-2021 09:01	0229_SW211_210401	✓

Proactive Holding Time Report

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



Requested Deliverables





CERTIFICATE OF ANALYSIS

Work Order : ET2102333
Client : AECOM Australia Pty Ltd
Contact Address
Telephone
Project : QLD_0229_PFASOMP_20
Order number : -
C-O-C number : 22730
Sampler
Site : QLD_0229
Quote number : TV/007/21 - Compass
No. of samples received : 4
No. of samples analysed : 4

Page : 1 of 7
Laboratory : Environmental Division Townsville
Contact Address
Telephone
Date Samples Received : 17-May-2021 17:17
Date Analysis Commenced : 19-May-2021
Issue Date : 25-May-2021 16:32



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.

Table with 3 columns: Signatories, Position, Accreditation Category. All content is redacted with black boxes.



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 Contact 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 PFAS: Sample '0229_SD144_210513' was diluted due to matrix interference. LOR adjusted accordingly.
- 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.
- All analysis will be conducted by [REDACTED], NATA accreditation no. 825, Site No. 818.
- 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.
- 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: SOIL (Matrix: SOIL)		Sample ID		0229_SD144_210513	----	----	----	----
		Sampling date / time		13-May-2021 12:11	----	----	----	----
Compound	CAS Number	LOR	Unit	ET2102333-002	-----	-----	-----	-----
				Result	----	----	----	----
EA055: Moisture Content (Dried @ 105-110°C)								
Moisture Content	----	0.1	%	66.8	----	----	----	----
EP231A: Perfluoroalkyl Sulfonic Acids								
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0010	----	----	----	----
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0010	----	----	----	----
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	0.0054	----	----	----	----
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	0.0013	----	----	----	----
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	0.356	----	----	----	----
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	0.0013	----	----	----	----
EP231B: Perfluoroalkyl Carboxylic Acids								
Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.005	----	----	----	----
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0010	----	----	----	----
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	0.0010	----	----	----	----
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0010	----	----	----	----
Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0010	----	----	----	----
Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0010	----	----	----	----
Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0010	----	----	----	----
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0010	----	----	----	----
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0010	----	----	----	----
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0010	----	----	----	----
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0025	----	----	----	----
EP231C: Perfluoroalkyl Sulfonamides								
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0010	----	----	----	----
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0025	----	----	----	----



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	0229_SD144_210513	----	----	----	----
Sampling date / time				13-May-2021 12:11	----	----	----	----	
Compound	CAS Number	LOR	Unit	ET2102333-002	-----	-----	-----	-----	
				Result	----	----	----	----	
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0025	----	----	----	----	
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0025	----	----	----	----	
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0025	----	----	----	----	
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0010	----	----	----	----	
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0010	----	----	----	----	
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0010	----	----	----	----	
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0010	----	----	----	----	
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0010	----	----	----	----	
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0010	----	----	----	----	
EP231P: PFAS Sums									
Sum of PFAS	----	0.0002	mg/kg	0.365	----	----	----	----	
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg	0.361	----	----	----	----	
Sum of PFAS (WA DER List)	----	0.0002	mg/kg	0.362	----	----	----	----	
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.0002	%	135	----	----	----	----	
13C8-PFOA	----	0.0002	%	90.0	----	----	----	----	



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	0229_SW144_210513	0229_QC306_210513	0229_QC503_210513	----	----
Sampling date / time				13-May-2021 12:11	13-May-2021 12:12	13-May-2021 12:12	----	----	
Compound	CAS Number	LOR	Unit	ET2102333-001	ET2102333-003	ET2102333-004	-----	-----	
				Result	Result	Result	----	----	
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	<0.02	<0.02	----	----	
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	<0.02	<0.02	----	----	
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.02	µg/L	0.06	<0.02	<0.02	----	----	
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	<0.02	<0.02	----	----	
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	0.07	<0.01	<0.01	----	----	
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	<0.02	<0.02	----	----	
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	<0.1	<0.1	----	----	
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	<0.02	<0.02	----	----	
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	<0.02	<0.02	----	----	
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	<0.02	<0.02	----	----	
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	<0.01	<0.01	----	----	
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	<0.02	<0.02	----	----	
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	<0.02	<0.02	----	----	
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	<0.02	<0.02	----	----	
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	<0.02	<0.02	----	----	
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	<0.02	<0.02	----	----	
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	<0.05	<0.05	----	----	
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	<0.02	<0.02	----	----	
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	<0.05	<0.05	----	----	
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	<0.05	<0.05	----	----	



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	0229_SW144_210513	0229_QC306_210513	0229_QC503_210513	----	----
Sampling date / time				13-May-2021 12:11	13-May-2021 12:12	13-May-2021 12:12	----	----	
Compound	CAS Number	LOR	Unit	ET2102333-001	ET2102333-003	ET2102333-004	-----	-----	
				Result	Result	Result	----	----	
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	<0.05	<0.05	----	----	
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	<0.05	<0.05	----	----	
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	<0.02	<0.02	----	----	
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	<0.02	<0.02	----	----	
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	<0.05	<0.05	----	----	
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	<0.05	<0.05	----	----	
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	<0.05	<0.05	----	----	
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	<0.05	<0.05	----	----	
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L	0.13	<0.01	<0.01	----	----	
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	0.13	<0.01	<0.01	----	----	
Sum of PFAS (WA DER List)	----	0.01	µg/L	0.13	<0.01	<0.01	----	----	
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%	86.8	107	103	----	----	
13C8-PFOA	----	0.02	%	96.5	95.0	94.7	----	----	



Surrogate Control Limits

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

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

Inter-Laboratory Testing

Analysis conducted by ALS Brisbane, NATA accreditation no. 825, site no. 818 (Chemistry) 18958 (Biology).

- (WATER) EP231A: Perfluoroalkyl Sulfonic Acids
- (WATER) EP231B: Perfluoroalkyl Carboxylic Acids
- (WATER) EP231C: Perfluoroalkyl Sulfonamides
- (WATER) EP231D: (n:2) Fluorotelomer Sulfonic Acids
- (WATER) EP231P: PFAS Sums
- (WATER) EP231S: PFAS Surrogate
- (SOIL) EP231B: Perfluoroalkyl Carboxylic Acids
- (SOIL) EP231D: (n:2) Fluorotelomer Sulfonic Acids
- (SOIL) EP231C: Perfluoroalkyl Sulfonamides
- (SOIL) EP231A: Perfluoroalkyl Sulfonic Acids
- (SOIL) EP231P: PFAS Sums
- (SOIL) EP231S: PFAS Surrogate
- (SOIL) EA055: Moisture Content (Dried @ 105-110°C)



QUALITY CONTROL REPORT

Work Order : **ET2102333**

Client : **AECOM Australia Pty Ltd**

Contact : [Redacted]

Address : [Redacted]

Telephone : [Redacted]

Project : **QLD_0229_PFASOMP_20**

Order number : **-**

C-O-C number : **22730**

Sampler : [Redacted]

Site : **QLD_0229**

Quote number : **TV/007/21 - Compass**

No. of samples received : **4**

No. of samples analysed : **4**

Page : 1 of 10

Laboratory : **Environmental Division Townsville**

Contact : [Redacted]

Address : [Redacted]

Telephone : [Redacted]

Date Samples Received : **17-May-2021**

Date Analysis Commenced : **19-May-2021**

Issue Date : **25-May-2021**



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]	[Redacted]	[Redacted]
[Redacted]	[Redacted]	[Redacted]



General Comments

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

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

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

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: 3686403)									
EB2113388-001	Anonymous	EA055: Moisture Content	----	0.1	%	4.7	4.7	0.0	0% - 20%
EB2113694-008	Anonymous	EA055: Moisture Content	----	0.1	%	1.3	1.4	13.1	0% - 50%
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 3686401)									
EB2113388-001	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
EB2113694-008	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	<0.0002	<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: 3686401)									
EB2113388-001	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



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: 3686401) - continued									
EB2113388-001	Anonymous	EP231X: Perfluorotridecanoic acid (PFTTrDA)	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
EB2113694-008	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 (PFTTrDA)	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: 3686401)									
EB2113388-001	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
EB2113694-008	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



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: 3686401)									
EB2113388-001	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
EB2113694-008	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

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: 3686928)									
EB2113451-055	Anonymous	EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	0.05	0.05	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: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.02	µg/L	0.08	0.07	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: 3686928)									
EB2113451-055	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: 3686928)									
EB2113451-055	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: 3686928) - continued									
EB2113451-055	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: 3686928)									
EB2113451-055	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: 3686928)									
EB2113451-055	Anonymous	EP231X: Sum of PFAS	----	0.01	µg/L	0.13	0.12	8.0	0% - 50%
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	0.13	0.12	8.0	0% - 50%
		EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	0.13	0.12	8.0	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: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report				
				Result	Spike Concentration	Spike Recovery (%)		Acceptable Limits (%)	
						LCS	Low	High	
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 3686401)									
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	0.0011 mg/kg	84.1	72.0	128	
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	0.00117 mg/kg	88.5	73.0	123	
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	0.00118 mg/kg	80.1	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	86.2	68.0	136	
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	0.0012 mg/kg	98.3	59.0	134	
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 3686401)									
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	0.00625 mg/kg	86.2	71.0	135	
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	0.00125 mg/kg	83.2	69.0	132	
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	0.00125 mg/kg	84.8	70.0	132	
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	0.00125 mg/kg	84.0	71.0	131	
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	91.2	69.0	133	
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	89.2	72.0	129	
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	0.00125 mg/kg	91.6	69.0	133	
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	88.0	64.0	136	
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	85.6	69.0	135	
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	79.6	66.0	139	
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	0.00312 mg/kg	82.4	69.0	133	
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 3686401)									
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	0.00125 mg/kg	89.2	67.0	137	
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	0.00312 mg/kg	89.1	59.6	143	
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	0.00312 mg/kg	76.8	62.8	140	
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	0.00312 mg/kg	93.3	61.5	139	
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	0.00312 mg/kg	84.3	61.9	137	
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	0.00125 mg/kg	86.8	63.0	144	
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	0.00125 mg/kg	74.0	61.0	139	
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 3686401)									
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	0.00117 mg/kg	99.6	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	84.3	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	95.4	65.0	137	



Sub-Matrix: **SOIL**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report Result	Laboratory Control Spike (LCS) Report				
					Spike Concentration	Spike Recovery (%)		Acceptable Limits (%)	
						LCS	Low	High	
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 3686401) - continued									
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	0.0012 mg/kg	95.4	54.8	124	

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report Result	Laboratory Control Spike (LCS) Report				
					Spike Concentration	Spike Recovery (%)		Acceptable Limits (%)	
						LCS	Low	High	
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 3686928)									
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.2218 µg/L	115	72.0	130	
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.2352 µg/L	112	71.0	127	
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.02	µg/L	<0.02	0.2373 µg/L	101	68.0	131	
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.238 µg/L	104	69.0	134	
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.232 µg/L	120	65.0	140	
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.241 µg/L	108	53.0	142	
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 3686928)									
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	1.25 µg/L	115	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	114	72.0	129	
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	0.25 µg/L	108	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	106	69.0	130	
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	0.25 µg/L	112	71.0	129	
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	0.25 µg/L	107	69.0	133	
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	0.25 µg/L	107	72.0	134	
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	0.25 µg/L	95.6	65.0	144	
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	0.625 µg/L	112	71.0	132	
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 3686928)									
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.25 µg/L	107	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	103	60.5	138	
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	0.625 µg/L	110	68.3	134	
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	0.625 µg/L	109	62.6	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	113	61.0	135	
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 3686928)									
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.2343 µg/L	115	63.0	143	
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	0.2378 µg/L	119	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 (%)	Acceptable Limits (%)	
						LCS	Low	High
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 3686928) - continued								
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	0.24 µg/L	122	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	110	64.2	133
EP231P: PFAS Sums (QCLot: 3686928)								
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: SOIL

Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report			
				Spike Concentration	Spike Recovery(%) MS	Low	High
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 3686401)							
EB2113388-009	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0011 mg/kg	85.4	72.0	128
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.00117 mg/kg	87.6	73.0	123
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.00118 mg/kg	73.3	67.0	130
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.00119 mg/kg	97.9	70.0	132
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.00116 mg/kg	71.1	68.0	136
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0012 mg/kg	84.2	59.0	134
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 3686401)							
EB2113388-009	Anonymous	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.00625 mg/kg	80.9	71.0	135
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.00125 mg/kg	85.6	69.0	132
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.00125 mg/kg	87.6	70.0	132
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.00125 mg/kg	83.6	71.0	131
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.00125 mg/kg	87.6	69.0	133
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.00125 mg/kg	87.6	72.0	129
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.00125 mg/kg	88.4	69.0	133
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.00125 mg/kg	87.2	64.0	136
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.00125 mg/kg	89.6	69.0	135
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.00125 mg/kg	79.6	66.0	139
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.00312 mg/kg	87.2	69.0	133
		EP231C: Perfluoroalkyl Sulfonamides (QCLot: 3686401)					
EB2113388-009	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.00125 mg/kg	84.0	48.0	128
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.00312 mg/kg	92.1	70.0	130



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: 3686401) - continued							
EB2113388-009	Anonymous	EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.00312 mg/kg	84.4	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.00312 mg/kg	92.5	70.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.00312 mg/kg	75.8	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.00125 mg/kg	96.0	63.0	144
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.00125 mg/kg	88.8	61.0	139
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 3686401)							
EB2113388-009	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.00117 mg/kg	95.7	62.0	145
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.00118 mg/kg	91.9	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0012 mg/kg	92.9	65.0	137
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0012 mg/kg	91.2	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
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 3686928)							
EB2113451-060	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.2218 µg/L	119	72.0	130
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.235 µg/L	116	71.0	127
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.2352 µg/L	103	68.0	131
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.238 µg/L	112	69.0	134
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.232 µg/L	118	65.0	140
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.241 µg/L	113	53.0	142
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 3686928)							
EB2113451-060	Anonymous	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	1.25 µg/L	112	73.0	129
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.25 µg/L	101	72.0	129
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.25 µg/L	118	72.0	129
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.25 µg/L	111	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	111	69.0	130
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.25 µg/L	112	71.0	129
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.25 µg/L	113	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	95.4	65.0	144
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.625 µg/L	122	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 3686928)							
EB2113451-060	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.25 µg/L	114	59.0	135



Sub-Matrix: WATER

Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report			
				Spike Concentration	SpikeRecovery(%) MS	Acceptable Limits (%)	
				Low	High		
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 3686928) - continued							
EB2113451-060	Anonymous	EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.625 µg/L	113	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	113	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.25 µg/L	113	65.0	136
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.25 µg/L	121	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 3686928)							
EB2113451-060	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.234 µg/L	116	63.0	143
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.2378 µg/L	118	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.24 µg/L	126	67.0	138
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.2415 µg/L	113	70.0	130

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: ET2102333	Page	: 1 of 5
Client	: AECOM Australia Pty Ltd	Laboratory	: Environmental Division Townsville
Contact	: [REDACTED]	Telephone	: [REDACTED]
Project	: QLD_0229_PFASOMP_20	Date Samples Received	: 17-May-2021
Site	: QLD_0229	Issue Date	: 25-May-2021
Sampler	: [REDACTED]	No. of samples received	: 4
Order number	: -	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) 0229_SD144_210513	13-May-2021	----	----	----	19-May-2021	27-May-2021	✓
EP231A: Perfluoroalkyl Sulfonic Acids							
HDPE Soil Jar (EP231X) 0229_SD144_210513	13-May-2021	24-May-2021	09-Nov-2021	✓	24-May-2021	03-Jul-2021	✓
EP231B: Perfluoroalkyl Carboxylic Acids							
HDPE Soil Jar (EP231X) 0229_SD144_210513	13-May-2021	24-May-2021	09-Nov-2021	✓	24-May-2021	03-Jul-2021	✓
EP231C: Perfluoroalkyl Sulfonamides							
HDPE Soil Jar (EP231X) 0229_SD144_210513	13-May-2021	24-May-2021	09-Nov-2021	✓	24-May-2021	03-Jul-2021	✓
EP231D: (n:2) Fluorotelomer Sulfonic Acids							
HDPE Soil Jar (EP231X) 0229_SD144_210513	13-May-2021	24-May-2021	09-Nov-2021	✓	24-May-2021	03-Jul-2021	✓
EP231P: PFAS Sums							
HDPE Soil Jar (EP231X) 0229_SD144_210513	13-May-2021	24-May-2021	09-Nov-2021	✓	24-May-2021	03-Jul-2021	✓

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) 0229_SW144_210513, 0229_QC503_210513	0229_QC306_210513, 13-May-2021	24-May-2021	09-Nov-2021	✓	24-May-2021	09-Nov-2021	✓
EP231B: Perfluoroalkyl Carboxylic Acids							
HDPE (no PTFE) (EP231X) 0229_SW144_210513, 0229_QC503_210513	0229_QC306_210513, 13-May-2021	24-May-2021	09-Nov-2021	✓	24-May-2021	09-Nov-2021	✓



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) 0229_SW144_210513, 0229_QC503_210513	0229_QC306_210513,	13-May-2021	24-May-2021	09-Nov-2021	✓	24-May-2021	09-Nov-2021	✓
EP231D: (n:2) Fluorotelomer Sulfonic Acids								
HDPE (no PTFE) (EP231X) 0229_SW144_210513, 0229_QC503_210513	0229_QC306_210513,	13-May-2021	24-May-2021	09-Nov-2021	✓	24-May-2021	09-Nov-2021	✓
EP231P: PFAS Sums								
HDPE (no PTFE) (EP231X) 0229_SW144_210513, 0229_QC503_210513	0229_QC306_210513,	13-May-2021	24-May-2021	09-Nov-2021	✓	24-May-2021	09-Nov-2021	✓



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	Method	Count		Rate (%)			Quality Control Specification
		QC	Regular	Actual	Expected	Evaluation	
Analytical Methods							
Laboratory Duplicates (DUP)							
Moisture Content	EA055	2	16	12.50	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
Laboratory Control Samples (LCS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	16	6.25	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	16	6.25	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	16	6.25	5.00	✔	NEPM 2013 B3 & ALS QC Standard

Matrix: WATER

Evaluation: ✖ = Quality Control frequency not within specification ; ✔ = Quality Control frequency within specification.

Quality Control Sample Type	Method	Count		Rate (%)			Quality Control Specification
		QC	Regular	Actual	Expected	Evaluation	
Analytical Methods							
Laboratory Duplicates (DUP)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	9	11.11	10.00	✔	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	9	11.11	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	9	11.11	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	9	11.11	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.
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
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.
Solid Phase Extraction (SPE) for PFAS in water	ORG72	WATER	In-house: Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to the sample container. The entire contents are transferred to a solid phase extraction (SPE) cartridge. The sample container is successively rinsed with aliquots of the elution solvent. The eluted extract is combined with an equal volume of reagent water and a portion is filtered for analysis. Method procedures conform to US DoD QSM 5.3, table B-15 requirements.



SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : ET2102333

Client : AECOM Australia Pty Ltd
Contact Address
E-mail
Telephone
Facsimile
Project : QLD_0229_PFASOMP_20
Order number
C-O-C number : 22730
Site : QLD_0229
Sampler

Laboratory : Environmental Division Townsville
Contact Address
E-mail
Telephone
Facsimile
Page : 1 of 3
Quote number : ET2021AECOMAU0001 (TV/007/21 - Compass)
QC Level : NEPM 2013 B3 & ALS QC Standard

Dates

Date Samples Received : 17-May-2021 17:17
Client Requested Due Date : 26-May-2021
Issue Date : 18-May-2021
Scheduled Reporting Date : 26-May-2021

Delivery Details

Mode of Delivery : Client Drop Off
No. of coolers/boxes : 1
Receipt Detail : LARGE ESKY
Security Seal : Not Available
Temperature : 10.5°C
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
Discounted Package Prices apply only when specific ALS Group Codes ('W', 'S', 'NT' suites) are referenced on COCs.
Please direct any turn around / technical queries to the laboratory contact designated above.
Sample Disposal - Aqueous (3 weeks), Solid (2 months ± 1 week) from receipt of samples.
All analysis will be conducted by [redacted], NATA accreditation no. 825, Site No. 818.
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.



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)
ET2102333-002	13-May-2021 12:11	0229_SD144_210513	✓	✓

Matrix: **WATER**

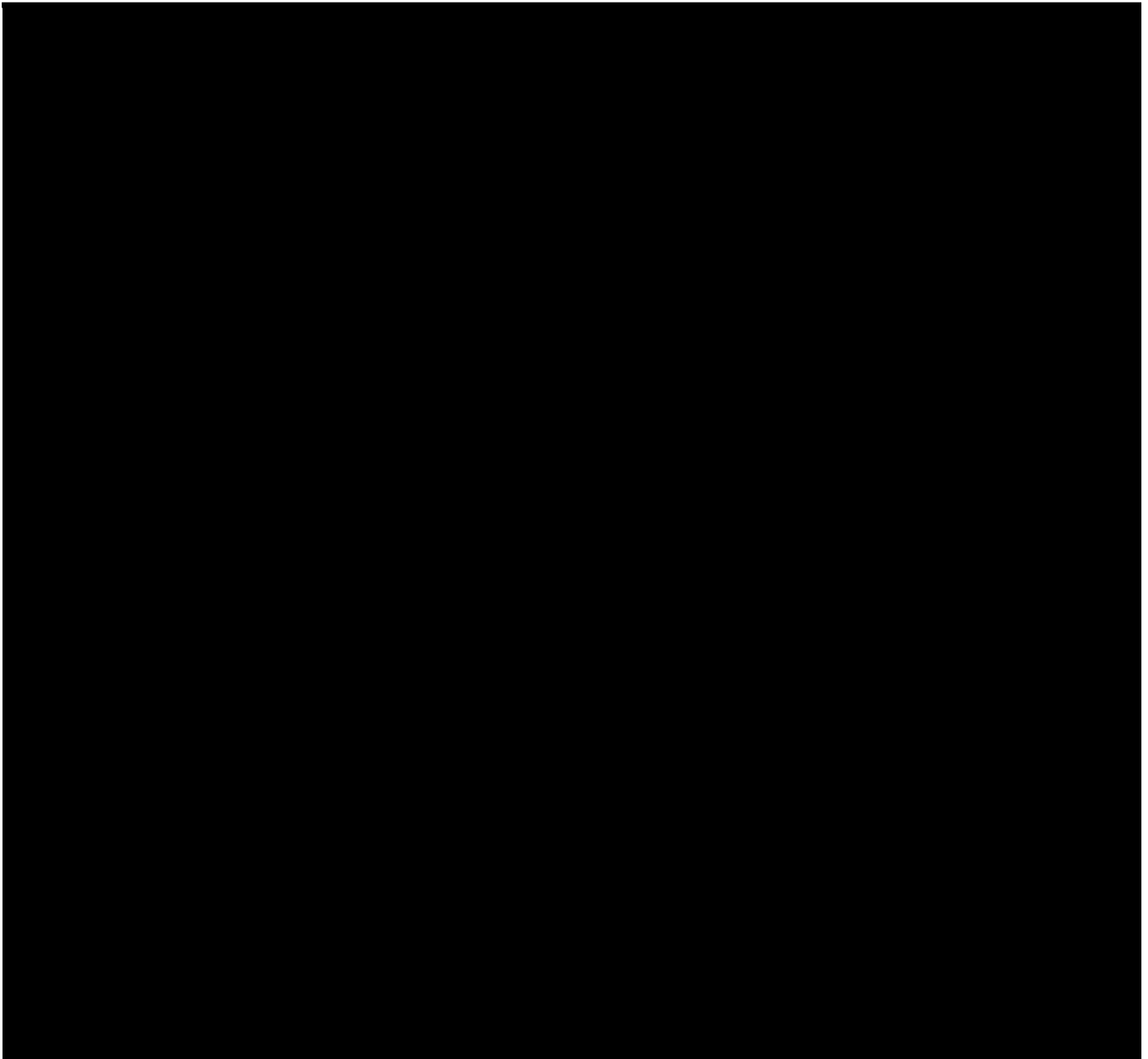
Laboratory sample ID	Sampling date / time	Sample ID	WATER - EP231X PFAS - Full Suite (28 analytes)
ET2102333-001	13-May-2021 12:11	0229_SW144_210513	✓
ET2102333-003	13-May-2021 12:12	0229_QC306_210513	✓
ET2102333-004	13-May-2021 12:12	0229_QC503_210513	✓

Proactive Holding Time Report

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



Requested Deliverables





REPORT OF ANALYSIS

Client : [REDACTED]	Job No. : AECO06/210407
[REDACTED]	Quote No. : QT-02018
[REDACTED]	Order No. : 60612487_3_1
Attention [REDACTED]	Date Received : 07-APR-2021
Project Name : QLD_0229_PFASOMP_20	Sampled By : CLIENT
Your Client Services Manager [REDACTED]	Phone [REDACTED]

Lab Reg No.	Sample Ref	Sample Description
N21/008900	0229_QC200_210326	SOIL 26/03/2021
N21/008903	0229_QC203_210329	SOIL 29/03/2021
N21/008905	0229_QC205_210329	SOIL 29/03/2021

Lab Reg No.		N21/008900	N21/008903	N21/008905		
Date Sampled		26-MAR-2021	29-MAR-2021	29-MAR-2021		
	Units					Method
PFAS (per-and poly-fluoroalkyl substances)						
PFBA (375-22-4)	mg/kg	<0.002	<0.002	<0.002		NR70
PFPeA (2706-90-3)	mg/kg	<0.002	<0.002	<0.002		NR70
PFHxA (307-24-4)	mg/kg	<0.001	<0.001	0.0011		NR70
PFHpA (375-85-9)	mg/kg	<0.001	<0.001	<0.001		NR70
PFOA (335-67-1)	mg/kg	<0.001	<0.001	<0.001		NR70
PFNA (375-95-1)	mg/kg	<0.001	<0.001	<0.001		NR70
PFDA (335-76-2)	mg/kg	<0.001	<0.001	<0.001		NR70
PFUdA (2058-94-8)	mg/kg	<0.002	<0.002	<0.002		NR70
PFDoA (307-55-1)	mg/kg	<0.002	<0.002	<0.002		NR70
PFTrDA (72629-94-8)	mg/kg	<0.002	<0.002	<0.002		NR70
PFTeDA (376-06-7)	mg/kg	<0.002	<0.002	<0.002		NR70
PFHxDA (67905-19-5)	mg/kg	<0.002	<0.002	<0.002		NR70
PFODA (16517-11-6)	mg/kg	<0.005	<0.005	<0.005		NR70
FOUEA (70887-84-2)	mg/kg	<0.001	<0.001	<0.001		NR70
PFBS (375-73-5)	mg/kg	<0.001	<0.001	<0.001		NR70
PFPeS (2706-91-4)	mg/kg	<0.001	<0.001	<0.001		NR70
PFHxS (355-46-4)	mg/kg	<0.001	<0.001	0.0084		NR70
PFHpS (375-92-8)	mg/kg	<0.001	<0.001	0.0011		NR70
PFOS (1763-23-1)	mg/kg	<0.002	<0.002	0.084		NR70
PFNS (68259-12-1)	mg/kg	<0.001	<0.001	<0.001		NR70
PFDS (335-77-3)	mg/kg	<0.001	<0.001	<0.001		NR70
PFOSA (754-91-6)	mg/kg	<0.001	<0.001	<0.001		NR70
N-MeFOSA (31506-32-8)	mg/kg	<0.002	<0.002	<0.002		NR70
N-EtFOSA (4151-50-2)	mg/kg	<0.002	<0.002	<0.002		NR70
N-MeFOSAA (2355-31-9)	mg/kg	<0.002	<0.002	<0.002		NR70
N-EtFOSAA(2991-50-6)	mg/kg	<0.002	<0.002	<0.002		NR70
N-MeFOSE (24448-09-7)	mg/kg	<0.005	<0.005	<0.005		NR70
N-EtFOSE (1691-99-2)	mg/kg	<0.005	<0.005	<0.005		NR70

REPORT OF ANALYSIS

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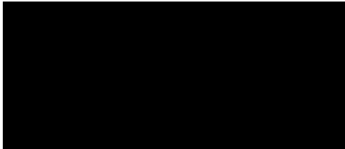
Lab Reg No.		N21/008900	N21/008903	N21/008905		
Date Sampled		26-MAR-2021	29-MAR-2021	29-MAR-2021		
	Units					Method
PFAS (per-and poly-fluoroalkyl substances)						
4:2 FTS (757124-72-4)	mg/kg	<0.001	<0.001	<0.001		NR70
6:2 FTS (27619-97-2)	mg/kg	<0.001	<0.001	0.0013		NR70
8:2 FTS (39108-34-4)	mg/kg	<0.001	<0.001	<0.001		NR70
10:2 FTS (120226-60-0)	mg/kg	<0.002	<0.002	<0.002		NR70
8:2 diPAP (678-41-1)	mg/kg	<0.002	<0.002	<0.002		NR70
PFBA (Surrogate Recovery)	%	104	102	111		NR70
PFPeA (Surrogate Recovery)	%	104	116	106		NR70
PFHxA (Surrogate Recovery)	%	92	112	112		NR70
PFHpA (Surrogate Recovery)	%	112	114	102		NR70
PFOA (Surrogate Recovery)	%	113	114	117		NR70
PFNA (Surrogate Recovery)	%	109	97	103		NR70
PFDA (Surrogate Recovery)	%	110	94	107		NR70
PFUdA (Surrogate Recovery)	%	120	92	67		NR70
PFDoA (Surrogate Recovery)	%	111	93	92		NR70
PFTeDA (Surrogate Recovery)	%	108	95	97		NR70
PFHxDA (Surrogate Recovery)	%	109	126	59		NR70
FOUEA (Surrogate Recovery)	%	68	64	69		NR70
PFBS (Surrogate Recovery)	%	109	116	109		NR70
PFHxS (Surrogate Recovery)	%	109	117	114		NR70
PFOS (Surrogate Recovery)	%	104	98	119		NR70
PFOSA (Surrogate Recovery)	%	116	89	70		NR70
N-MeFOSA (Surrogate Recovery)	%	95	128	70		NR70
N-EtFOSA (Surrogate Recovery)	%	105	123	104		NR70
N-MeFOSAA (Surrogate Recovery)	%	98	81	83		NR70
N-EtFOSAA (Surrogate Recovery)	%	108	91	85		NR70
N-MeFOSE (Surrogate Recovery)	%	113	91	79		NR70
N-EtFOSE (Surrogate Recovery)	%	97	78	51		NR70
4:2 FTS (Surrogate Recovery)	%	67	83	83		NR70
6:2 FTS (Surrogate Recovery)	%	101	90	69		NR70
8:2 FTS (Surrogate Recovery)	%	99	68	77		NR70
8:2 diPAP (Surrogate Recovery)	%	84	107	107		NR70
Dates						
Date extracted		12-APR-2021	12-APR-2021	12-APR-2021		
Date analysed		13-APR-2021	13-APR-2021	13-APR-2021		

N21/008900
to
N21/008905

REPORT OF ANALYSIS

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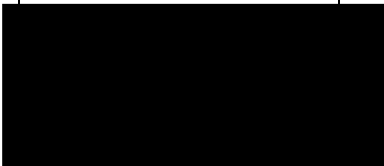
PFOS and PFHxS are quantified using a combined branched and linear standard,
linear and branched isomers are totalled for reporting.
All results corrected for labelled surrogate recoveries.



Organics - NSW
Accreditation No. 198

14-APR-2021

Lab Reg No.		N21/008900	N21/008903	N21/008905		
Date Sampled		26-MAR-2021	29-MAR-2021	29-MAR-2021		
	Units					Method
Trace Elements						
Total Solids	%	81.5	69.8	47.9		NT2_49
Dates						
Date extracted		8-APR-2021	8-APR-2021	8-APR-2021		
Date analysed		9-APR-2021	9-APR-2021	9-APR-2021		



Inorganics - NSW
Accreditation No. 198

14-APR-2021

All results are expressed on a dry weight basis.

REPORT OF ANALYSIS

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Client : ██████████ ██████████ ██████████ Attention : ██████████ Project Name : QLD_0229_PFASOMP_20 Your Client Services Manager : ██████████	Job No. : AECO06/210407 Quote No. : QT-02018 Order No. : 60612487_3_1 Date Received : 07-APR-2021 Sampled By : CLIENT Phone : ██████████
--	---

Lab Reg No.	Sample Ref	Sample Description
N21/008901	0229_QC201_210326	WATER 26/03/2021
N21/008902	0229_QC202_210329	WATER 29/03/2021
N21/008904	0229_QC204_210329	WATER 29/03/2021
N21/008906	0229_QC206_210331	WATER 31/03/2021

Lab Reg No.	Date Sampled	Units	N21/008901	N21/008902	N21/008904	N21/008906	Method
			26-MAR-2021	29-MAR-2021	29-MAR-2021	31-MAR-2021	
PFAS (per-and poly-fluoroalkyl substances)							
PFBA (375-22-4)	ug/L		<0.05	<0.05	<0.05	<0.05	NR70
PFPeA (2706-90-3)	ug/L		<0.02	<0.02	0.045	<0.02	NR70
PFHxA (307-24-4)	ug/L		<0.01	0.038	0.22	0.030	NR70
PFHpA (375-85-9)	ug/L		<0.01	<0.01	0.024	<0.01	NR70
PFOA (335-67-1)	ug/L		<0.01	0.015	0.054	<0.01	NR70
PFNA (375-95-1)	ug/L		<0.01	<0.01	<0.01	<0.01	NR70
PFDA (335-76-2)	ug/L		<0.01	<0.01	<0.01	<0.01	NR70
PFUdA (2058-94-8)	ug/L		<0.01	<0.01	<0.01	<0.01	NR70
PFDoA (307-55-1)	ug/L		<0.01	<0.01	<0.01	<0.01	NR70
PFTrDA (72629-94-8)	ug/L		<0.02	<0.02	<0.02	<0.02	NR70
PFTeDA (376-06-7)	ug/L		<0.02	<0.02	<0.02	<0.02	NR70
PFHxDA (67905-19-5)	ug/L		<0.02	<0.02	<0.02	<0.02	NR70
PFODA (16517-11-6)	ug/L		<0.05	<0.05	<0.05	<0.05	NR70
FOUEA (70887-84-2)	ug/L		<0.01	<0.01	<0.01	<0.01	NR70
PFDS (335-77-3)	ug/L		<0.01	<0.01	<0.01	<0.01	NR70
PFPeS (2706-91-4)	ug/L		<0.01	0.029	0.088	0.022	NR70
PFHxS (355-46-4)	ug/L		<0.01	0.29	0.81	0.17	NR70
PFHpS (375-92-8)	ug/L		<0.01	0.011	0.036	<0.01	NR70
PFOS (1763-23-1)	ug/L		<0.02	0.32	1.2	0.034	NR70
PFNS (68259-12-1)	ug/L		<0.01	<0.01	<0.01	<0.01	NR70
PFBS (375-73-5)	ug/L		<0.01	0.063	0.11	0.035	NR70
PFOSA (754-91-6)	ug/L		<0.01	<0.01	<0.01	<0.01	NR70
N-MeFOSA (31506-32-8)	ug/L		<0.02	<0.02	<0.02	<0.02	NR70
N-EtFOSA (4151-50-2)	ug/L		<0.02	<0.02	<0.02	<0.02	NR70
N-MeFOSAA (2355-31-9)	ug/L		<0.01	<0.01	<0.01	<0.01	NR70
N-EtFOSAA(2991-50-6)	ug/L		<0.01	<0.01	<0.01	<0.01	NR70
N-MeFOSE (24448-09-7)	ug/L		<0.05	<0.05	<0.05	<0.05	NR70

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Report No. RN1310407

Lab Reg No.			N21/008901	N21/008902	N21/008904	N21/008906	
Date Sampled			26-MAR-2021	29-MAR-2021	29-MAR-2021	31-MAR-2021	
		Units					Method
PFAS (per-and poly-fluoroalkyl substances)							
N-EtFOSE (1691-99-2)	ug/L	<0.05	<0.05	<0.05	<0.05	<0.05	NR70
4:2 FTS (757124-72-4)	ug/L	<0.01	<0.01	<0.01	<0.01	<0.01	NR70
6:2 FTS (27619-97-2)	ug/L	<0.01	<0.01	<0.01	<0.01	<0.01	NR70
8:2 FTS (39108-34-4)	ug/L	<0.01	<0.01	<0.01	<0.01	<0.01	NR70
10:2 FTS (120226-60-0)	ug/L	<0.01	<0.01	<0.01	<0.01	<0.01	NR70
8:2 diPAP (678-41-1)	ug/L	<0.02	<0.02	<0.02	<0.02	<0.02	NR70
PFBA (Surrogate Recovery)	%	100	98	99	94	94	NR70
PFPeA (Surrogate Recovery)	%	90	103	91	99	99	NR70
PFHxA (Surrogate Recovery)	%	98	112	89	109	109	NR70
PFHpA (Surrogate Recovery)	%	99	110	94	97	97	NR70
PFOA (Surrogate Recovery)	%	95	106	98	103	103	NR70
PFNA (Surrogate Recovery)	%	95	93	87	89	89	NR70
PFDA (Surrogate Recovery)	%	105	78	85	98	98	NR70
PFUdA (Surrogate Recovery)	%	85	85	78	94	94	NR70
PFDoA (Surrogate Recovery)	%	79	79	79	89	89	NR70
PFTeDA (Surrogate Recovery)	%	74	88	82	89	89	NR70
PFHxDA (Surrogate Recovery)	%	90	99	87	103	103	NR70
FOUEA (Surrogate Recovery)	%	75	74	77	82	82	NR70
PFBS (Surrogate Recovery)	%	95	103	95	99	99	NR70
PFHxS (Surrogate Recovery)	%	97	102	88	95	95	NR70
PFOS (Surrogate Recovery)	%	80	92	91	88	88	NR70
PFOSA (Surrogate Recovery)	%	72	68	61	77	77	NR70
N-MeFOSA (Surrogate Recovery)	%	61	79	72	74	74	NR70
N-EtFOSA (Surrogate Recovery)	%	59	58	60	103	103	NR70
N-MeFOSAA (Surrogate Recovery)	%	68	75	64	83	83	NR70
N-EtFOSAA (Surrogate Recovery)	%	97	82	77	123	123	NR70
N-MeFOSE (Surrogate Recovery)	%	71	74	65	83	83	NR70
N-EtFOSE (Surrogate Recovery)	%	71	112	75	91	91	NR70
4:2 FTS (Surrogate Recovery)	%	73	59	66	47	47	NR70
6:2 FTS (Surrogate Recovery)	%	68	62	64	64	64	NR70
8:2 FTS (Surrogate Recovery)	%	66	53	55	70	70	NR70
8:2 diPAP (Surrogate Recovery)	%	119	94	104	111	111	NR70
Dates							
Date extracted		12-APR-2021	12-APR-2021	12-APR-2021	12-APR-2021	12-APR-2021	
Date analysed		13-APR-2021	13-APR-2021	13-APR-2021	13-APR-2021	13-APR-2021	

N21/008901
to
N21/008909

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

Selected PFAS surrogate recoveries are biased due to matrix effects.^δ
Surrogate recoveries low for selected analytes - PFAS LORs not raised since S/N > 10.



Organics - NSW
Accreditation No. 198

14-APR-2021

REPORT OF ANALYSIS

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Report No. RN1310407

Client : ██████████ ██████████ ██████████ Attention ██████████ Project Name : QLD_0229_PFASOMP_20 Your Client Services Manager ██████████	Job No. : AECO06/210407 Quote No. : QT-02018 Order No. : 60612487_3_1 Date Received : 07-APR-2021 Sampled By : CLIENT Phone : ██████████
--	---

Lab Reg No.	Sample Ref	Sample Description
N21/008907	0229_QC207_210331	WATER 31/03/2021
N21/008908	0229_QC208_210331	WATER 31/03/2021
N21/008909	0229_QC209_210331	WATER 31/03/2021

Lab Reg No.	Sample Ref	Units	N21/008907	N21/008908	N21/008909	Method
Date Sampled			31-MAR-2021	31-MAR-2021	31-MAR-2021	
PFAS (per-and poly-fluoroalkyl substances)						
PFBA (375-22-4)	ug/L		<0.05	0.84	0.16	NR70
PFPeA (2706-90-3)	ug/L		<0.02	1.4	0.29	NR70
PFHxA (307-24-4)	ug/L		0.047	7.7	1.4	NR70
PFHpA (375-85-9)	ug/L		<0.01	1.0	0.18	NR70
PFOA (335-67-1)	ug/L		<0.01	2.4	0.37	NR70
PFNA (375-95-1)	ug/L		<0.01	3.4	<0.01	NR70
PFDA (335-76-2)	ug/L		<0.01	<0.01	<0.01	NR70
PFUdA (2058-94-8)	ug/L		<0.01	<0.01	<0.01	NR70
PFDoA (307-55-1)	ug/L		<0.01	<0.01	<0.01	NR70
PFTrDA (72629-94-8)	ug/L		<0.02	<0.02	<0.02	NR70
PFTeDA (376-06-7)	ug/L		<0.02	<0.02	<0.02	NR70
PFHxDA (67905-19-5)	ug/L		<0.02	<0.02	<0.02	NR70
PFODA (16517-11-6)	ug/L		<0.05	<0.05	<0.05	NR70
FOUEA (70887-84-2)	ug/L		<0.01	<0.01	<0.01	NR70
PFDS (335-77-3)	ug/L		<0.01	<0.01	<0.01	NR70
PFPeS (2706-91-4)	ug/L		0.097	4.4	0.84	NR70
PFHxS (355-46-4)	ug/L		0.34	40	5.1	NR70
PFHpS (375-92-8)	ug/L		<0.01	2.9	0.29	NR70
PFOS (1763-23-1)	ug/L		<0.02	93	8.8	NR70
PFNS (68259-12-1)	ug/L		<0.01	<0.01	<0.01	NR70
PFBS (375-73-5)	ug/L		0.13	4.9	0.94	NR70
PFOSA (754-91-6)	ug/L		<0.01	<0.01	<0.01	NR70
N-MeFOSA (31506-32-8)	ug/L		<0.02	<0.02	<0.02	NR70
N-EtFOSA (4151-50-2)	ug/L		<0.02	<0.02	<0.02	NR70
N-MeFOSAA (2355-31-9)	ug/L		<0.01	<0.01	<0.01	NR70
N-EtFOSAA(2991-50-6)	ug/L		<0.01	<0.01	<0.01	NR70
N-MeFOSE (24448-09-7)	ug/L		<0.05	<0.05	<0.05	NR70
N-EtFOSE (1691-99-2)	ug/L		<0.05	<0.05	<0.05	NR70

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Lab Reg No.			N21/008907	N21/008908	N21/008909		
Date Sampled			31-MAR-2021	31-MAR-2021	31-MAR-2021		
		Units					Method
PFAS (per- and poly-fluoroalkyl substances)							
4:2 FTS (757124-72-4)	ug/L	<0.01	<0.01	<0.01	<0.01		NR70
6:2 FTS (27619-97-2)	ug/L	<0.01	0.16	<0.01	<0.01		NR70
8:2 FTS (39108-34-4)	ug/L	<0.01	<0.01	<0.01	<0.01		NR70
10:2 FTS (120226-60-0)	ug/L	<0.01	<0.01	<0.01	<0.01		NR70
8:2 diPAP (678-41-1)	ug/L	<0.02	<0.02	<0.02	<0.02		NR70
PFBA (Surrogate Recovery)	%	101	97	101			NR70
PFPeA (Surrogate Recovery)	%	96	95	85			NR70
PFHxA (Surrogate Recovery)	%	93	65	75			NR70
PFHpA (Surrogate Recovery)	%	100	111	92			NR70
PFOA (Surrogate Recovery)	%	93	98	80			NR70
PFNA (Surrogate Recovery)	%	89	45	87			NR70
PFDA (Surrogate Recovery)	%	99	98	94			NR70
PFUdA (Surrogate Recovery)	%	107	105	102			NR70
PFDoA (Surrogate Recovery)	%	102	99	90			NR70
PFTeDA (Surrogate Recovery)	%	92	96	90			NR70
PFHxDA (Surrogate Recovery)	%	95	134	87			NR70
FOUEA (Surrogate Recovery)	%	75	111	87			NR70
PFBS (Surrogate Recovery)	%	88	98	89			NR70
PFHxS (Surrogate Recovery)	%	88	49	68			NR70
PFOS (Surrogate Recovery)	%	95	123	111			NR70
PFOSA (Surrogate Recovery)	%	98	89	80			NR70
N-MeFOSA (Surrogate Recovery)	%	71	84	80			NR70
N-EtFOSA (Surrogate Recovery)	%	59	96	72			NR70
N-MeFOSAA (Surrogate Recovery)	%	103	96	81			NR70
N-EtFOSAA (Surrogate Recovery)	%	98	86	95			NR70
N-MeFOSE (Surrogate Recovery)	%	80	140	79			NR70
N-EtFOSE (Surrogate Recovery)	%	93	103	77			NR70
4:2 FTS (Surrogate Recovery)	%	42	64	41			NR70
6:2 FTS (Surrogate Recovery)	%	56	88	55			NR70
8:2 FTS (Surrogate Recovery)	%	66	78	68			NR70
8:2 diPAP (Surrogate Recovery)	%	102	103	99			NR70
Dates							
Date extracted		12-APR-2021	12-APR-2021	12-APR-2021			
Date analysed		13-APR-2021	13-APR-2021	13-APR-2021			



Organics - NSW
Accreditation No. 198

14-APR-2021

105 Delhi Road, North Ryde NSW 2113 Tel: +61 2 9449 0111 Web: industry.gov.au/measurement

National Measurement Institute

REPORT OF ANALYSIS

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ACCREDITED FOR
**TECHNICAL
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This report shall not be reproduced except in full.
Results relate only to the sample(s) as received and tested.

This Report supersedes reports: *RN1310399*

Measurement Uncertainty is available upon request.

Chemical Accreditation 198: 105 Delhi Road, North Ryde, NSW, 2113



Australian Government
National Measurement Institute

QUALITY ASSURANCE REPORT

Client: AECOM AUSTRALIA PTY LTD

NMI QA Report No: AECO06/210407

Sample Matrix: Liquid

Analyte	Method	LOR	Blank	Sample Duplicates			Recoveries	
		ug/L	ug/L	Sample ug/L	Duplicate ug/L	RPD %	LCS %	Matrix Spike %
				N21/008901				N21/008901
PFBA (375-22-4)	NR70	0.05	<0.05	<0.05	<0.05	-	114	100
PFPeA (2706-90-3)	NR70	0.02	<0.02	<0.02	<0.02	-	104	99
PFHxA (307-24-4)	NR70	0.01	<0.01	<0.01	<0.01	-	110	103
PFHpA (375-85-9)	NR70	0.01	<0.01	<0.01	<0.01	-	106	100
PFOA (335-67-1)	NR70	0.01	<0.01	<0.01	<0.01	-	101	104
PFNA (375-95-1)	NR70	0.01	<0.01	<0.01	<0.01	-	107	107
PFDA (335-76-2)	NR70	0.01	<0.01	<0.01	<0.01	-	98	104
PFUdA (2058-94-8)	NR70	0.01	<0.01	<0.01	<0.01	-	111	112
PFDoA (307-55-1)	NR70	0.01	<0.01	<0.01	<0.01	-	103	102
PFTTrDA (72629-94-8)	NR70	0.02	<0.02	<0.02	<0.02	-	102	97
PFHpDA (376-06-7)	NR70	0.02	<0.02	<0.02	<0.02	-	112	105
PFHxDA (67905-19-5)	NR70	0.02	<0.02	<0.02	<0.02	-	108	113
PFODA (16517-11-6)	NR70	0.05	<0.05	<0.05	<0.05	-	109	116
FOUEA (70887-84-2)	NR70	0.01	<0.01	<0.01	<0.01	-	112	111
PFBS (375-73-5)	NR70	0.01	<0.01	<0.01	<0.01	-	102	101
PFPeS (2706-91-4)	NR70	0.01	<0.01	<0.01	<0.01	-	100	102
PFHxS (355-46-4)	NR70	0.01	<0.01	<0.01	<0.01	-	102	106
PFHpS (375-92-8)	NR70	0.01	<0.01	<0.01	<0.01	-	99	108
PFOS (1763-23-1)	NR70	0.02	<0.02	<0.02	<0.02	-	108	103
PFNS (68259-12-1)	NR70	0.01	<0.01	<0.01	<0.01	-	104	93
PFDS (335-77-3)	NR70	0.01	<0.01	<0.01	<0.01	-	108	91
PFOSA (754-91-6)	NR70	0.01	<0.01	<0.01	<0.01	-	103	99
N-MeFOSA (31506-32-8)	NR70	0.02	<0.02	<0.02	<0.02	-	96	100
N-EtFOSA (4151-50-2)	NR70	0.02	<0.02	<0.02	<0.02	-	110	89
N-MeFOSAA (2355-31-9)	NR70	0.01	<0.01	<0.01	<0.01	-	99	108
N-EtFOSAA (2991-50-6)	NR70	0.01	<0.01	<0.01	<0.01	-	107	102
N-MeFOSE (24448-09-7)	NR70	0.05	<0.05	<0.05	<0.05	-	65	80
N-EtFOSE (1691-99-2)	NR70	0.05	<0.05	<0.05	<0.05	-	150	98
4:2 FTS (757124-72-4)	NR70	0.01	<0.01	<0.01	<0.01	-	105	110
6:2 FTS (27619-97-2)	NR70	0.01	<0.01	<0.01	<0.01	-	115	114
8:2 FTS (39108-34-4)	NR70	0.01	<0.01	<0.01	<0.01	-	100	123
10:2 FTS (120226-60-0)	NR70	0.01	<0.01	<0.01	<0.01	-	109	104
8:2 diPAP (678-41-1)	NR70	0.02	<0.02	<0.02	<0.02	-	117	113

Results expressed in percentage (%) or ug/L wherever appropriate.

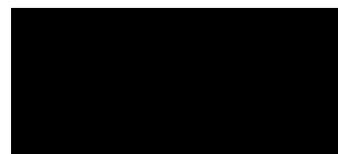
Acceptable Spike recovery is 50-150%.

Maximum acceptable RPDs on spikes and duplicates is 40%.

'NA' = Not Applicable.

RPD= Relative Percentage Difference.

Signed:



Organics Manager, NMI-North Ryde
14/04/2021

Date:



Australian Government
National Measurement Institute

QUALITY ASSURANCE REPORT

Client: AECOM AUSTRALIA PTY LTD

NMI QA Report No: AECO06/210407

Sample Matrix: Solid

Analyte	Method	LOR	Blank	Sample Duplicates			Recoveries	
		mg/kg	mg/kg	Sample mg/kg	Duplicate mg/kg	RPD %	LCS %	Matrix Spike %
PFBA (375-22-4)	NR70	0.002	<0.002	NA	NA	NA	124	NA
PFPeA (2706-90-3)	NR70	0.002	<0.002	NA	NA	NA	101	NA
PFHxA (307-24-4)	NR70	0.001	<0.001	NA	NA	NA	104	NA
PFHpA (375-85-9)	NR70	0.001	<0.001	NA	NA	NA	106	NA
PFOA (335-67-1)	NR70	0.001	<0.001	NA	NA	NA	107	NA
PFNA (375-95-1)	NR70	0.001	<0.001	NA	NA	NA	107	NA
PFDA (335-76-2)	NR70	0.001	<0.001	NA	NA	NA	104	NA
PFUdA (2058-94-8)	NR70	0.002	<0.002	NA	NA	NA	104	NA
PFDoA (307-55-1)	NR70	0.002	<0.002	NA	NA	NA	106	NA
PFTTrDA (72629-94-8)	NR70	0.002	<0.002	NA	NA	NA	105	NA
PFTeDA (376-06-7)	NR70	0.002	<0.002	NA	NA	NA	113	NA
PFHxDA (67905-19-5)	NR70	0.002	<0.002	NA	NA	NA	110	NA
PFODA (16517-11-6)	NR70	0.005	<0.005	NA	NA	NA	100	NA
FOUEA (70887-84-2)	NR70	0.001	<0.001	NA	NA	NA	110	NA
PFBS (375-73-5)	NR70	0.001	<0.001	NA	NA	NA	109	NA
PFPeS (2706-91-4)	NR70	0.001	<0.001	NA	NA	NA	110	NA
PFHxS (355-46-4)	NR70	0.001	<0.001	NA	NA	NA	106	NA
PFHpS (375-92-8)	NR70	0.001	<0.001	NA	NA	NA	105	NA
PFOS (1763-23-1)	NR70	0.002	<0.002	NA	NA	NA	126	NA
PFNS (68259-12-1)	NR70	0.001	<0.001	NA	NA	NA	108	NA
PFDS (335-77-3)	NR70	0.001	<0.001	NA	NA	NA	104	NA
PFOSA (754-91-6)	NR70	0.001	<0.001	NA	NA	NA	99	NA
N-MeFOSA (31506-32-8)	NR70	0.002	<0.002	NA	NA	NA	148	NA
N-EtFOSA (4151-50-2)	NR70	0.002	<0.002	NA	NA	NA	112	NA
N-MeFOSAA (2355-31-9)	NR70	0.002	<0.002	NA	NA	NA	120	NA
N-EtFOSAA(2991-50-6)	NR70	0.002	<0.002	NA	NA	NA	86	NA
N-MeFOSE (24448-09-7)	NR70	0.005	<0.005	NA	NA	NA	94	NA
N-EtFOSE (1691-99-2)	NR70	0.005	<0.005	NA	NA	NA	126	NA
4:2 FTS (757124-72-4)	NR70	0.001	<0.001	NA	NA	NA	99	NA
6:2 FTS (27619-97-2)	NR70	0.001	<0.001	NA	NA	NA	122	NA
8:2 FTS (39108-34-4)	NR70	0.001	<0.001	NA	NA	NA	122	NA
10:2 FTS (120226-60-0)	NR70	0.002	<0.002	NA	NA	NA	130	NA
8:2 diPAP (678-41-1)	NR70	0.002	<0.002	NA	NA	NA	104	NA

Results expressed in percentage (%) or mg/kg wherever appropriate.

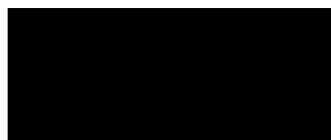
Acceptable Spike recovery is 50-150%.

Maximum acceptable RPDs on spikes and duplicates is 40%.

'NA' = Not Applicable.

RPD= Relative Percentage Difference.

Signed:



Organics Manager, NMI-North Ryde
14/04/2021

Date:



SAMPLE RECEIPT NOTIFICATION

CUSTOMER DETAILS

Attention:
Customer: AECOM AUSTRALIA PTY LTD
Address: [REDACTED]
Email: [REDACTED]
Telephone:
Fax:

LABORATORY DETAILS

Lab: National Measurement Institute
Contact: [REDACTED]
Address: [REDACTED]
Email: [REDACTED]
Telephone: [REDACTED]
Fax:

SAMPLE DETAILS

NMI Job Name: AECO06/210407

Total No. of Samples: 10

LRNs	Estimated Report Date	Customer Sample ID	Lab Sample Description
N21/008900	14-APR-2021	0229_QC200_210326	SOIL 26/03/2021
N21/008901	14-APR-2021	0229_QC201_210326	WATER 26/03/2021
N21/008902	14-APR-2021	0229_QC202_210329	WATER 29/03/2021
N21/008903	14-APR-2021	0229_QC203_210329	SOIL 29/03/2021
N21/008904	14-APR-2021	0229_QC204_210329	WATER 29/03/2021
N21/008905	14-APR-2021	0229_QC205_210329	SOIL 29/03/2021
N21/008906	14-APR-2021	0229_QC206_210331	WATER 31/03/2021
N21/008907	14-APR-2021	0229_QC207_210331	WATER 31/03/2021
N21/008908	14-APR-2021	0229_QC208_210331	WATER 31/03/2021
N21/008909	14-APR-2021	0229_QC209_210331	WATER 31/03/2021

SAMPLE RECEIVED CONDITION

Date samples received: 7-APR-2021

Sample received in good order: Yes

NMI Quotation no. provided: QLD_0229_PFASOMP_20

Client purchase order number: 60612487_3_1

Temperature of samples: Chilled

Comments:

Mode of Delivery: Courier

Additional Terms and Conditions

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

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

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



CERTIFICATE OF ANALYSIS

Work Order : ET2102888
Client : AECOM Australia Pty Ltd
Contact : [Redacted]
Address : [Redacted]
Telephone : [Redacted]
Project : QLD_0229_PFASOMP_20
Order number : 0229
C-O-C number : 24466
Sampler : [Redacted]
Site : 0229
Quote number : TV/007/21 - Compass
No. of samples received : 6
No. of samples analysed : 6

Page : 1 of 7
Laboratory : Environmental Division Townsville
Contact : [Redacted]
Address : [Redacted]
Telephone : [Redacted]
Date Samples Received : 23-Jun-2021 08:45
Date Analysis Commenced : 25-Jun-2021
Issue Date : 30-Jun-2021 14:40



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.

Table with 3 columns: Signatories, Position, Accreditation Category. All rows are redacted.



General Comments

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

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

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

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

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

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contact 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.
- All remaining analysis will be conducted by [REDACTED], NATA accreditation no. 825, Site No. 818.
- 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.
- EP231: Stable isotope enriched internal standards are added to samples prior to extraction. Target compounds have a direct analogous internal standard with the exception of PFPeS, PFHpA, PFDS, PFTrDA and 10:2 FTS. These compounds use an internal standard that is chemically related and has a retention time close to that of the target compound. The DQO for internal standard response is 50-150% of that established at initial calibration. PFOS is quantified using a certified, traceable standard consisting of linear and branched PFOS isomers. These practices are in line with recommendations in the National Environmental Management Plan for PFAS (Australian HEPA) and also conform to QSM 5.3 (US DoD) requirements.



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	0229_SW135_210622	0229_QC100_210622	0229_QC500_210622	0229_SW139_210622	0229_QC300_210622
Sampling date / time				22-Jun-2021 13:36	22-Jun-2021 13:36	22-Jun-2021 13:35	22-Jun-2021 14:02	22-Jun-2021 14:31	
Compound	CAS Number	LOR	Unit	ET2102888-001	ET2102888-002	ET2102888-003	ET2102888-004	ET2102888-005	
				Result	Result	Result	Result	Result	
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	0.12	0.12	<0.02	0.18	<0.02	
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	0.08	0.08	<0.02	0.17	<0.02	
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.02	µg/L	1.02	1.00	<0.02	1.18	<0.02	
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	0.05	0.04	<0.02	0.07	<0.02	
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	2.44	2.28	<0.01	1.60	<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	0.07	<0.02	
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	0.08	0.08	<0.02	0.37	<0.02	
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	<0.02	<0.02	0.05	<0.02	
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	0.03	0.04	<0.01	0.10	<0.01	
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	0.04	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	<0.02	<0.02	<0.02	<0.02	<0.02	
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05	
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05	



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	0229_SW135_210622	0229_QC100_210622	0229_QC500_210622	0229_SW139_210622	0229_QC300_210622
Sampling date / time				22-Jun-2021 13:36	22-Jun-2021 13:36	22-Jun-2021 13:35	22-Jun-2021 14:02	22-Jun-2021 14:31	
Compound	CAS Number	LOR	Unit	ET2102888-001	ET2102888-002	ET2102888-003	ET2102888-004	ET2102888-005	
				Result	Result	Result	Result	Result	
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05	
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05	
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02	
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02	
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05	
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05	
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05	
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05	
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L	3.86	3.67	<0.01	3.79	<0.01	
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	3.46	3.28	<0.01	2.78	<0.01	
Sum of PFAS (WA DER List)	----	0.01	µg/L	3.69	3.52	<0.01	3.55	<0.01	
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%	98.2	98.0	96.9	92.7	94.2	
13C8-PFOA	----	0.02	%	99.9	103	95.5	102	95.6	



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)		Sample ID		0229_QC400_210622	----	----	----	----
		Sampling date / time		22-Jun-2021 14:31	----	----	----	----
Compound	CAS Number	LOR	Unit	ET2102888-006	-----	-----	-----	-----
				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	0.02	µg/L	<0.02	----	----	----	----
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	----	----	----	----
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	----	----	----	----



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)		Sample ID	0229_QC400_210622	----	----	----	----
Sampling date / time		22-Jun-2021 14:31	----	----	----	----	----
Compound	CAS Number	LOR	Unit	ET2102888-006	-----	-----	-----
				Result	----	----	----
EP231C: Perfluoroalkyl Sulfonamides - Continued							
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	%	95.3	----	----	----
13C8-PFOA	----	0.02	%	97.7	----	----	----



Surrogate Control Limits

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

Inter-Laboratory Testing

Analysis conducted by ALS Brisbane, NATA accreditation no. 825, site no. 818 (Chemistry) 18958 (Biology).

(WATER) EP231A: Perfluoroalkyl Sulfonic Acids

(WATER) EP231B: Perfluoroalkyl Carboxylic Acids

(WATER) EP231C: Perfluoroalkyl Sulfonamides

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

(WATER) EP231P: PFAS Sums

(WATER) EP231S: PFAS Surrogate



QUALITY CONTROL REPORT

Work Order : ET2102888
Client : AECOM Australia Pty Ltd
Contact Address
Telephone :
Project : QLD_0229_PFASOMP_20
Order number : 0229
C-O-C number : 24466
Sampler
Site : 0229
Quote number : TV/007/21 - Compass
No. of samples received : 6
No. of samples analysed : 6

Page : 1 of 6
Laboratory : Environmental Division Townsville
Contact Address
Telephone
Date Samples Received : 23-Jun-2021
Date Analysis Commenced : 25-Jun-2021
Issue Date : 30-Jun-2021



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.

Table with 3 columns: Signatories, Position, Accreditation Category. Content is redacted.



General Comments

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

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

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

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: 3757962)									
ET2102888-001	0229_SW135_210622	EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	2.44	2.53	3.7	0% - 20%
		EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	0.12	0.13	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	0.08	0.07	0.0	No Limit
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.02	µg/L	1.02	1.12	9.2	0% - 20%
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	0.05	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: 3757962)									
ET2102888-001	0229_SW135_210622	EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	0.03	0.03	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	0.08	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	0.04	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	<0.1	<0.1	0.0	No Limit
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 3757962)									
ET2102888-001	0229_SW135_210622	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: 3757962) - continued									
ET2102888-001	0229_SW135_210622	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: 3757962)									
ET2102888-001	0229_SW135_210622	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: 3757962)									
ET2102888-001	0229_SW135_210622	EP231X: Sum of PFAS	----	0.01	µg/L	3.86	4.04	4.6	0% - 20%
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	3.46	3.65	5.3	0% - 20%
		EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	3.69	3.88	5.0	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: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
				Result	Spike Concentration	Spike Recovery (%)	Acceptable Limits (%)	
						LCS	Low	High
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 3757962)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.2218 µg/L	115	72.0	130
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.2352 µg/L	123	71.0	127
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.02	µg/L	<0.02	0.2373 µg/L	108	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	120	65.0	140
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.241 µg/L	128	53.0	142
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 3757962)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	1.25 µg/L	126	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	116	72.0	129
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	0.25 µg/L	113	72.0	130
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	0.25 µg/L	114	71.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	0.25 µg/L	122	69.0	130
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	0.25 µg/L	119	71.0	129
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	0.25 µg/L	115	69.0	133
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	0.25 µg/L	128	72.0	134
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	0.25 µg/L	116	65.0	144
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	0.625 µg/L	120	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 3757962)								
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	100	68.0	141
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	0.625 µg/L	109	60.5	138
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	0.625 µg/L	119	68.3	134
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	0.625 µg/L	114	62.6	138
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	0.25 µg/L	134	65.0	136
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	0.25 µg/L	115	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 3757962)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.2343 µg/L	120	63.0	143
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	0.2378 µg/L	114	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



Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report Result	Laboratory Control Spike (LCS) Report			
					Spike Concentration	Spike Recovery (%)	Acceptable Limits (%)	
						LCS	Low	High
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 3757962) - continued								
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	0.241 µg/L	125	64.2	133
EP231P: PFAS Sums (QCLot: 3757962)								
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	Spike Recovery(%)	Acceptable Limits (%)		
					MS	Low	High	
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 3757962)								
ET2102888-002	0229_QC100_210622	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.2218 µg/L	120	72.0	130	
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.235 µg/L	110	71.0	127	
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.2352 µg/L	# Not Determined	68.0	131	
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.238 µg/L	111	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	126	53.0	142	
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 3757962)								
ET2102888-002	0229_QC100_210622	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	1.25 µg/L	110	73.0	129	
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.25 µg/L	118	72.0	129	
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.25 µg/L	108	72.0	129	
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.25 µg/L	117	72.0	130	
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.25 µg/L	106	71.0	133	
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.25 µg/L	128	69.0	130	
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.25 µg/L	111	71.0	129	
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.25 µg/L	112	69.0	133	
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.25 µg/L	122	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	0.625 µg/L	106	71.0	132	
		EP231C: Perfluoroalkyl Sulfonamides (QCLot: 3757962)						
		ET2102888-002	0229_QC100_210622	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.25 µg/L	126	59.0



Sub-Matrix: WATER

				Matrix Spike (MS) Report			
				Spike	Spike Recovery(%)	Acceptable Limits (%)	
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 3757962) - continued							
ET2102888-002	0229_QC100_210622	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	118	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	123	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	106	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 3757962)							
ET2102888-002	0229_QC100_210622	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.234 µg/L	134	63.0	143
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.2378 µg/L	102	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.24 µg/L	100	67.0	138
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.2415 µg/L	129	70.0	130

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: ET2102888	Page	: 1 of 5
Client	: AECOM Australia Pty Ltd	Laboratory	: Environmental Division Townsville
Contact	[REDACTED]	Telephone	[REDACTED]
Project	: QLD_0229_PFASOMP_20	Date Samples Received	: 23-Jun-2021
Site	: 0229	Issue Date	: 30-Jun-2021
Sampler	[REDACTED]	No. of samples received	: 6
Order number	: 0229	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							
EP231A: Perfluoroalkyl Sulfonic Acids	ET2102888--002	0229_QC100_210622	Perfluorohexane sulfonic acid (PFHxS)	355-46-4	Not Determined	----	MS recovery not determined, background level greater than or equal to 4x spike level.
EP231A: Perfluoroalkyl Sulfonic Acids	ET2102888--002	0229_QC100_210622	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: 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) 0229_SW135_210622, 0229_QC500_210622, 0229_QC300_210622,	0229_QC100_210622, 0229_SW139_210622, 0229_QC400_210622	22-Jun-2021	25-Jun-2021	19-Dec-2021	✓	25-Jun-2021	19-Dec-2021	✓
EP231B: Perfluoroalkyl Carboxylic Acids								
HDPE (no PTFE) (EP231X) 0229_SW135_210622, 0229_QC500_210622, 0229_QC300_210622,	0229_QC100_210622, 0229_SW139_210622, 0229_QC400_210622	22-Jun-2021	25-Jun-2021	19-Dec-2021	✓	25-Jun-2021	19-Dec-2021	✓
EP231C: Perfluoroalkyl Sulfonamides								
HDPE (no PTFE) (EP231X) 0229_SW135_210622, 0229_QC500_210622, 0229_QC300_210622,	0229_QC100_210622, 0229_SW139_210622, 0229_QC400_210622	22-Jun-2021	25-Jun-2021	19-Dec-2021	✓	25-Jun-2021	19-Dec-2021	✓
EP231D: (n:2) Fluorotelomer Sulfonic Acids								
HDPE (no PTFE) (EP231X) 0229_SW135_210622, 0229_QC500_210622, 0229_QC300_210622,	0229_QC100_210622, 0229_SW139_210622, 0229_QC400_210622	22-Jun-2021	25-Jun-2021	19-Dec-2021	✓	25-Jun-2021	19-Dec-2021	✓

Page : 3 of 5
 Work Order : ET2102888
 Client : AECOM Australia Pty Ltd
 Project : QLD_0229_PFASOMP_20



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)								
0229_SW135_210622,	0229_QC100_210622,	22-Jun-2021	25-Jun-2021	19-Dec-2021	✓	25-Jun-2021	19-Dec-2021	✓
0229_QC500_210622,	0229_SW139_210622,							
0229_QC300_210622,	0229_QC400_210622							



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	Method	Count		Rate (%)			Quality Control Specification
		QC	Regular	Actual	Expected	Evaluation	
Analytical Methods							
Laboratory Duplicates (DUP)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	6	16.67	10.00	✔	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	6	16.67	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	6	16.67	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	6	16.67	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.

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



SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : ET2102888

Client : AECOM Australia Pty Ltd

Contact : [Redacted]
Address : [Redacted]

Laboratory : Environmental Division Townsville

Contact : [Redacted]
Address : [Redacted]

E-mail : [Redacted]
Telephone : ----
Facsimile : ----

E-mail : [Redacted]
Telephone : [Redacted]
Facsimile : [Redacted]

Project : QLD_0229_PFASOMP_20
Order number : -

Page : 1 of 3
Quote number : ET2021AECOMAU0001 (TV/007/21 - Compass)

C-O-C number : 24466

QC Level : NEPM 2013 B3 & ALS QC Standard

Site : 0229
Sampler : [Redacted]

Dates

Date Samples Received : 23-Jun-2021 08:45

Issue Date : 23-Jun-2021

Client Requested Due Date : 30-Jun-2021

Scheduled Reporting Date : 30-Jun-2021

Delivery Details

Mode of Delivery : Carrier

Security Seal : Intact.

No. of coolers/boxes : 1

Temperature : 5.7°C - Ice present

Receipt Detail : MEDIUM

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
- ***Samples were originally received by [Redacted] on 22/06/21, and forwarded to [Redacted] for analysis.**
- **23.6.21: SRN has been resent to acknowledge changes in sample IDs as requested by the client. For any further information regarding these adjustments please contact client services at [Redacted]**
- Discounted Package Prices apply only when specific ALS Group Codes ('W', 'S', 'NT' suites) are referenced on COCs.
- Please direct any turn around / technical queries to the laboratory contact designated above.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months ± 1 week) from receipt of samples.
- **Breaches in recommended extraction / analysis holding times (if any) are displayed overleaf in the Proactive Holding Time Report table.**
- All remaining analysis will be conducted by ALS Environmental, Brisbane, NATA accreditation no. 825, Site No. 818.
- 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**

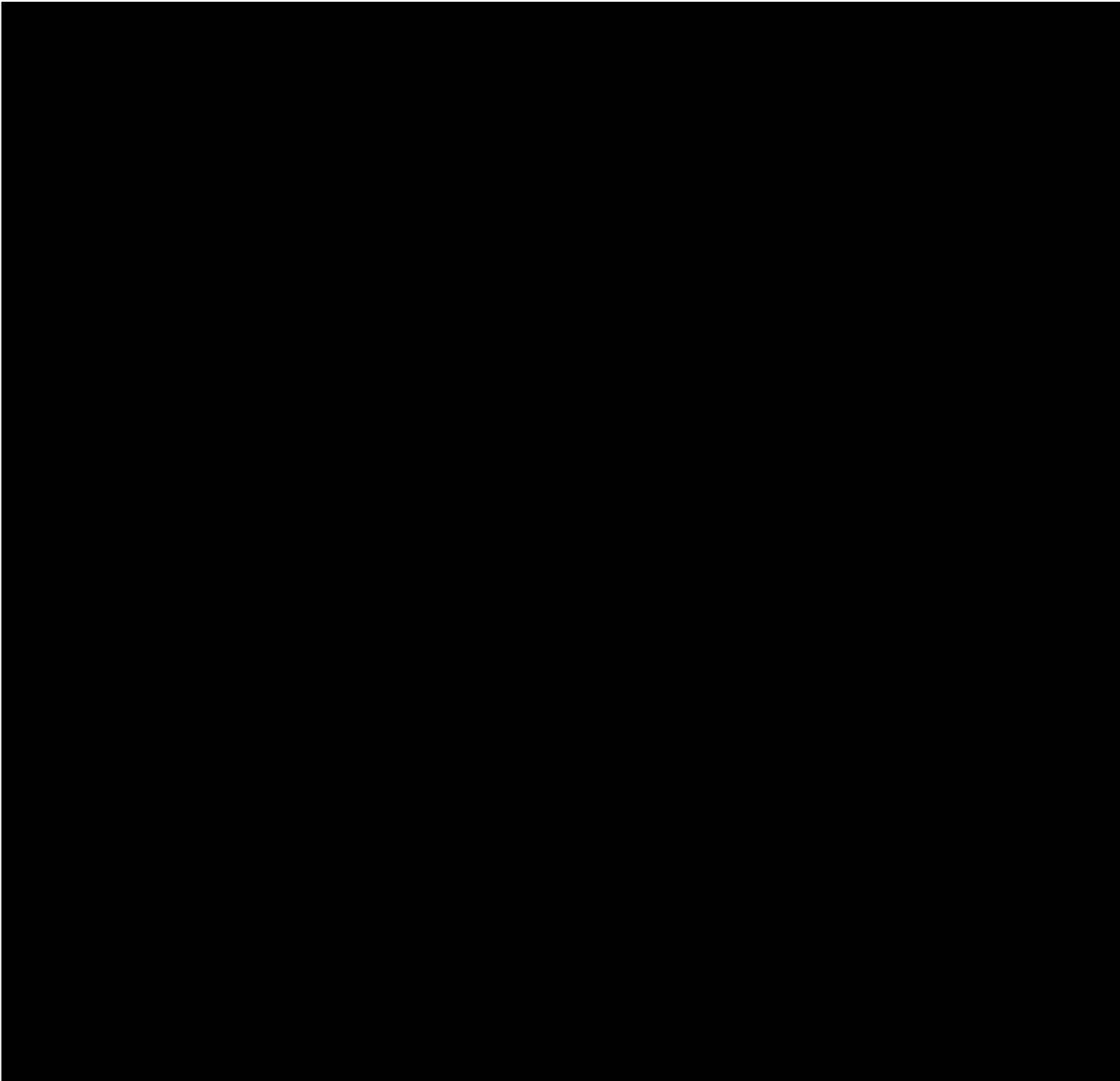
Laboratory sample ID	Sampling date / time	Sample ID	WATER - EP231X PFAS - Full Suite (28 analytes)
ET2102888-001	22-Jun-2021 13:36	0229_SW135_210622	✓
ET2102888-002	22-Jun-2021 13:36	0229_QC100_210622	✓
ET2102888-003	22-Jun-2021 13:35	0229_QC500_210622	✓
ET2102888-004	22-Jun-2021 14:02	0229_SW139_210622	✓
ET2102888-005	22-Jun-2021 14:31	0229_QC300_210622	✓
ET2102888-006	22-Jun-2021 14:31	0229_QC400_210622	✓

Proactive Holding Time Report

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



Requested Deliverables





REPORT OF ANALYSIS

Client : AECOM AUSTRALIA PTY LTD	Job No. : AECO06/210624
	Quote No. : QT-02018
	Order No. : 60612487_3_1
	Date Received : 24-JUN-2021
Attention :	Sampled By : CLIENT
Project Name : QLD_0229_PFASOMP_20	
Your Client Services Manager :	Phone :

Lab Reg No.	Sample Ref	Sample Description
N21/015896	0229_QC200_220621	WATER 22/06/2021 13:30

Lab Reg No.	Units	N21/015896				Method
Date Sampled		22-JUN-2021				
PFAS (per-and poly-fluoroalkyl substances)						
PFBA (375-22-4)	ug/L	< 0.05				NR70
PFPeA (2706-90-3)	ug/L	< 0.02				NR70
PFHxA (307-24-4)	ug/L	0.049				NR70
PFHpA (375-85-9)	ug/L	< 0.01				NR70
PFOA (335-67-1)	ug/L	0.023				NR70
PFNA (375-95-1)	ug/L	0.025				NR70
PFDA (335-76-2)	ug/L	< 0.01				NR70
PFUdA (2058-94-8)	ug/L	< 0.01				NR70
PFDoA (307-55-1)	ug/L	< 0.01				NR70
PFTrDA (72629-94-8)	ug/L	< 0.02				NR70
PFTeDA (376-06-7)	ug/L	< 0.02				NR70
PFHxDA (67905-19-5)	ug/L	< 0.02				NR70
PFODA (16517-11-6)	ug/L	< 0.05				NR70
FOUEA (70887-84-2)	ug/L	< 0.01				NR70
PFDS (335-77-3)	ug/L	< 0.01				NR70
PFPeS (2706-91-4)	ug/L	0.053				NR70
PFHxS (355-46-4)	ug/L	0.82				NR70
PFHpS (375-92-8)	ug/L	0.028				NR70
PFOS (1763-23-1)	ug/L	1.9				NR70
PFNS (68259-12-1)	ug/L	< 0.01				NR70
PFBS (375-73-5)	ug/L	0.092				NR70
PFOSA (754-91-6)	ug/L	< 0.01				NR70
N-MeFOSA (31506-32-8)	ug/L	< 0.02				NR70
N-EtFOSA (4151-50-2)	ug/L	< 0.02				NR70
N-MeFOSAA (2355-31-9)	ug/L	< 0.01				NR70
N-EtFOSAA(2991-50-6)	ug/L	< 0.01				NR70
N-MeFOSE (24448-09-7)	ug/L	< 0.05				NR70
N-EtFOSE (1691-99-2)	ug/L	< 0.05				NR70
4:2 FTS (757124-72-4)	ug/L	< 0.01				NR70
6:2 FTS (27619-97-2)	ug/L	< 0.01				NR70

REPORT OF ANALYSIS

Page: 2 of 3
Report No. RN1320071

Lab Reg No.		N21/015896				
Date Sampled		22-JUN-2021				
	Units					Method
PFAS (per-and poly-fluoroalkyl substances)						
8:2 FTS (39108-34-4)	ug/L	<0.01				NR70
10:2 FTS (120226-60-0)	ug/L	<0.01				NR70
8:2 diPAP (678-41-1)	ug/L	<0.02				NR70
PFBA (Surrogate Recovery)	%	95				NR70
PFPeA (Surrogate Recovery)	%	111				NR70
PFHxA (Surrogate Recovery)	%	108				NR70
PFHpA (Surrogate Recovery)	%	107				NR70
PFOA (Surrogate Recovery)	%	115				NR70
PFNA (Surrogate Recovery)	%	94				NR70
PFDA (Surrogate Recovery)	%	85				NR70
PFUdA (Surrogate Recovery)	%	98				NR70
PFDoA (Surrogate Recovery)	%	85				NR70
PFTeDA (Surrogate Recovery)	%	100				NR70
PFHxDA (Surrogate Recovery)	%	111				NR70
FOUEA (Surrogate Recovery)	%	92				NR70
PFBS (Surrogate Recovery)	%	100				NR70
PFHxS (Surrogate Recovery)	%	105				NR70
PFOS (Surrogate Recovery)	%	98				NR70
PFOSA (Surrogate Recovery)	%	80				NR70
N-MeFOSA (Surrogate Recovery)	%	86				NR70
N-EtFOSA (Surrogate Recovery)	%	103				NR70
N-MeFOSAA (Surrogate Recovery)	%	89				NR70
N-EtFOSAA (Surrogate Recovery)	%	83				NR70
N-MeFOSE (Surrogate Recovery)	%	103				NR70
N-EtFOSE (Surrogate Recovery)	%	88				NR70
4:2 FTS (Surrogate Recovery)	%	83				NR70
6:2 FTS (Surrogate Recovery)	%	87				NR70
8:2 FTS (Surrogate Recovery)	%	75				NR70
8:2 diPAP (Surrogate Recovery)	%	143				NR70
Dates						
Date extracted		29-JUN-2021				
Date analysed		30-JUN-2021				

N21/015896

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

REPORT OF ANALYSIS

Page: 3 of 3
Report No. RN1320071

Lab Reg No.		N21/015896				
Date Sampled		22-JUN-2021				
	Units					Method

Organics - NSW
Accreditation No. 198

01-JUL-2021



ACCREDITED FOR
**TECHNICAL
COMPETENCE**

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

This Report supersedes reports: *RN1320069*

Measurement Uncertainty is available upon request.
Chemical Accreditation 198: 105 Delhi Road, North Ryde, NSW, 2113



Australian Government
National Measurement Institute

QUALITY ASSURANCE REPORT

Client: AECOM AUSTRALIA PTY LTD

NMI QA Report No: AECO06/210624

Sample Matrix: Liquid

Analyte	Method	LOR	Blank	Sample Duplicates			Recoveries	
		ug/L	ug/L	Sample ug/L	Duplicate ug/L	RPD %	LCS %	Matrix Spike %
PFBA (375-22-4)	NR70	0.05	<0.05	NA	NA	NA	110	NA
PFPeA (2706-90-3)	NR70	0.02	<0.02	NA	NA	NA	106	NA
PFHxA (307-24-4)	NR70	0.01	<0.01	NA	NA	NA	100	NA
PFHpA (375-85-9)	NR70	0.01	<0.01	NA	NA	NA	108	NA
PFOA (335-67-1)	NR70	0.01	<0.01	NA	NA	NA	108	NA
PFNA (375-95-1)	NR70	0.01	<0.01	NA	NA	NA	120	NA
PFDA (335-76-2)	NR70	0.01	<0.01	NA	NA	NA	104	NA
PFUdA (2058-94-8)	NR70	0.01	<0.01	NA	NA	NA	100	NA
PFDaA (307-55-1)	NR70	0.01	<0.01	NA	NA	NA	106	NA
PFTrDA (72629-94-8)	NR70	0.02	<0.02	NA	NA	NA	108	NA
PFTeDA (376-06-7)	NR70	0.02	<0.02	NA	NA	NA	103	NA
PFHxDA (67905-19-5)	NR70	0.02	<0.02	NA	NA	NA	112	NA
PFODA (16517-11-6)	NR70	0.05	<0.05	NA	NA	NA	118	NA
FOUEA (70887-84-2)	NR70	0.01	<0.01	NA	NA	NA	113	NA
PFBS (375-73-5)	NR70	0.01	<0.01	NA	NA	NA	111	NA
PFPeS (2706-91-4)	NR70	0.01	<0.01	NA	NA	NA	108	NA
PFHxS (355-46-4)	NR70	0.01	<0.01	NA	NA	NA	109	NA
PFHpS (375-92-8)	NR70	0.01	<0.01	NA	NA	NA	109	NA
PFOS (1763-23-1)	NR70	0.02	<0.02	NA	NA	NA	104	NA
PFNS (68259-12-1)	NR70	0.01	<0.01	NA	NA	NA	105	NA
PFDS (335-77-3)	NR70	0.01	<0.01	NA	NA	NA	104	NA
PFOSA (754-91-6)	NR70	0.01	<0.01	NA	NA	NA	112	NA
N-MeFOSA (31506-32-8)	NR70	0.02	<0.02	NA	NA	NA	115	NA
N-EtFOSA (4151-50-2)	NR70	0.02	<0.02	NA	NA	NA	103	NA
N-MeFOSAA (2355-31-9)	NR70	0.01	<0.01	NA	NA	NA	104	NA
N-EtFOSAA(2991-50-6)	NR70	0.01	<0.01	NA	NA	NA	99	NA
N-MeFOSE (24448-09-7)	NR70	0.05	<0.05	NA	NA	NA	129	NA
N-EtFOSE (1691-99-2)	NR70	0.05	<0.05	NA	NA	NA	116	NA
4:2 FTS (757124-72-4)	NR70	0.01	<0.01	NA	NA	NA	98	NA
6:2 FTS (27619-97-2)	NR70	0.01	<0.01	NA	NA	NA	114	NA
8:2 FTS (39108-34-4)	NR70	0.01	<0.01	NA	NA	NA	114	NA
10:2 FTS (120226-60-0)	NR70	0.01	<0.01	NA	NA	NA	105	NA
8:2 diPAP (678-41-1)	NR70	0.02	<0.02	NA	NA	NA	107	NA

Results expressed in percentage (%) or ug/L wherever appropriate.

Acceptable Spike recovery is 50-150%.

Maximum acceptable RPDs on spikes and duplicates is 40%.

'NA' = Not Applicable.

RPD= Relative Percentage Difference.

Signed:



Organics Manager, NMI-North Ryde
1/07/2021

Date:



SAMPLE RECEIPT NOTIFICATION

CUSTOMER DETAILS

Attention: [REDACTED]
Customer: AECOM AUSTRALIA PTY LTD
Address: [REDACTED]
Email: [REDACTED]
Telephone:
Fax:

LABORATORY DETAILS

Lab: National Measurement Institute
Contact: [REDACTED]
Address: [REDACTED]
Email: [REDACTED]
Telephone: [REDACTED]
Fax:

SAMPLE DETAILS

NMI Job Name: AECO06/210624

Total No. of Samples: 1

LRNs	Estimated Report Date	Customer Sample ID	Lab Sample Description
N21/015896	1-JUL-2021	0229_QC200_220621	WATER 22/06/2021 13:30

SAMPLE RECEIVED CONDITION

Date samples received: 24-JUN-2021
Sample received in good order: Yes
NMI Quotation no. provided: QLD_0229_PFASOMP_20
Client purchase order number: 60612487_3_1
Temperature of samples: Chilled
Comments: SAMPLE ID WAS CORRECTED TO QC200 AS PER BOTTLE LABEL- PLEASE A
Mode of Delivery: Courier

Additional Terms and Conditions

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

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

The lodgement of an order or receipt of samples for NMI services referenced in this Sample Receipt Notification constitutes an acceptance of the current version of NMI Terms and Conditions or other applicable Terms referenced in the NMI Quotation.

NMI Terms and Conditions are available on the web at

<https://www.industry.gov.au/client-services/testing-and-analysis-services/chemical-and-biological-analysis-services-terms-and-conditions>

Appendix F

Equipment Calibration Records

Multi Parameter Water Meter



airmet

Air-Met Scientific Pty Ltd
1300 137 067

Instrument YSI Quatro Pro Plus
Serial No. 10H100322

Item	Test	Pass	Comments
Battery	Charge Condition	✓	
	Fuses	✓	
	Capacity	✓	
Switch/keypad	Operation	✓	
Display	Intensity	✓	
	Operation (segments)	✓	
Grill Filter	Condition	✓	
	Seal	✓	
PCB	Condition	✓	
Connectors	Condition	✓	
Sensor	1. pH	✓	10 meter Cable
	2. mV	✓	
	3. EC	✓	
	4. D.O	✓	
	5. Temp	✓	
Alarms	Beeper		
	Settings		
Software	Version		
Data logger	Operation		
Download	Operation		
Other tests:			

Certificate of Calibration

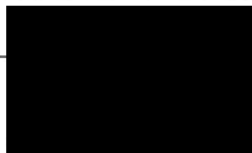
This is to certify that the above instrument has been calibrated to the following specifications:

Sensor	Serial no	Standard Solutions	Certified	Solution Bottle Number	Instrument Reading
1. pH 7.00		pH 7.02	NIST	358580	pH 7.02
2. pH 4.00		pH 4.00	NIST	357330	pH 4.00
3. mV		235.8mV	NIST	358632/354593	235.8mV
4. EC		2760uS	NIST	354263	2761uS
6. D.O		0 ppm	NIST	10959	0 ppm
7. Temp		21.9°C	NIST	Testo Mini901	21.9°C

Calibrated by:

Calibration date: 25/03/2021

Next calibration due: 25/09/2021



Oil / Water Interface Meter

Air-Met Scientific Pty Ltd
1300 137 067

Instrument Interface Meter (30M)
Serial No. 349190

Item	Test	Pass	Comments
Battery	Compartment	✓	
	Capacity	✓	
Probe	Cleaned/Decon.	✓	
	Operation	✓	
Connectors	Condition	✓	
		✓	
Tape Check	Cleaned	✓	
	Checked for cuts	✓	
Instrument Test	At surface level	✓	

Certificate of Calibration

This is to certify that the above instrument has been cleaned and tested.

Calibrated by:

Calibration date: 23/03/2021

Next calibration due: 23/06/2021

ANZ

FQM - Water Quality Meter Calibration Record

Q4AN(EV)-410-FM1

Project Name:	PFAS omp	Project Number:	60612487
Project Location:	LAVARACK BARRACKS	Client:	DEFENCE
PM Name:	[REDACTED]	Fieldwork Staff Name:	[REDACTED]

This calibration record is intended to prompt fieldwork staff to calibrate water quality meter (WQM) daily before the start of fieldworks.

INSTRUMENT DETAILS

Supplier:	AIRMET
Make and Model:	YSI PRODS5
Serial Number:	18K102334

CALIBRATION

CALIBRATE WITH CALIBRATION SOLUTIONS

Date and Time:	26/3/21 0645				
Parameter	Acidity		Conductivity	ORP	Dissolved Oxygen
Units	pH	pH	µS/cm	mV ppm	ppm %
Calibration Standard Concentration:	7.00	4.01	2813	231.3	99.4
Calibration Reading:	7.03	4.04	2590	235.2	97.2
Calibration Temperature:	26.8	26.7	26.2	24.8	25.5

BUMP TESTS CALIBRATION

BUMP TEST WITH CALIBRATION SOLUTION

Date and Time:	29/3/21 0645				
Parameter	Acidity		Conductivity	ORP	Dissolved Oxygen
Units	pH	pH	µS/cm	mV ppm	ppm %
Calibration Standard Concentration:	7.00	4.01	2865	228.4	99.6
Bump Test Reading:	7.12	4.04	2779	227.5	98.9
Bump Test Temperature:	27.0	27.5	27.2	27.0	25.9

COMMENTS

Detail any equipment faults, minor maintenance performed, change of batteries or technical support provided.

[Empty space for comments]

Approval and Distribution

Each individual instrument has been inspected and calibrated daily and bump tested as required by fieldwork staff.

[REDACTED]
Fieldwork Staff Signature

29/3/21
Date

Distribution: Project Central File

ANZ

FQM - Water Quality Meter Calibration Record

Q4AN(EV)-410-FM1

Project Name:	REKNE PRATOMO		Project Number:	60612487-2-1	
Project Location:	LAURACK BARRACK		Client:	DEPT of REKNE	
PM Name:	[REDACTED]		Fieldwork Staff Name:	[REDACTED]	
This calibration record is intended to prompt fieldwork staff to calibrate water quality meter (WQM) daily before the start of fieldworks.					
INSTRUMENT DETAILS					
Supplier:	AECOM				
Make and Model:	PRO PLUS (481)				
Serial Number:	18K102254				
CALIBRATION					
CALIBRATE WITH CALIBRATION SOLUTIONS					
Date and Time:	30.03.21 0745				
Parameter	Acidity		Conductivity	Dissolved Oxygen	
Units	pH	pH	µS/cm	mg/l	mg/l
Calibration Standard Concentration:	7	4	2760	99.5	231.6
Calibration Reading:	6.89	3.95	3423	100.3	234.8
Calibration Temperature:	21.9	24.9	24.4	29.4	24.5
ONGOING CHECKS					
BUMP TEST WITH CALIBRATION SOLUTION					
Date and Time:	31.03.21 0700				
Parameter	Acidity		Conductivity	Dissolved Oxygen	
Units	pH	pH	µS/cm	mg/l	mg/l
Calibration Standard Concentration:	7.01	4.01	2760	99.5	232.5
Bump Test Reading:	7.032	4.00	2378	100.2	231.1
Bump Test Temperature:	24.3	25.1	24.3	29.3	23.8
COMMENTS					
Detail any equipment faults, minor maintenance performed, change of batteries or technical support provided.					
Approval and Distribution					
<input checked="" type="checkbox"/> Each individual instrument has been inspected and calibrated daily and bump tested as required by fieldwork staff.					
[REDACTED]			31.03.21		
Fieldwork Staff Signature			Date		
Distribution: Project Central File					

ANZ

FQM - Water Quality Meter Calibration Record

Q4AN(EV)-410-FM1

Project Name:	PFAS OMP	Project Number:	60612487
Project Location:	LAVARACK BARRACKS	Client:	DEFENCE
PM Name:	[REDACTED]	Fieldwork Staff Name:	[REDACTED]

This calibration record is intended to prompt fieldwork staff to calibrate water quality meter (WQM) daily before the start of fieldworks.

INSTRUMENT DETAILS

Supplier:	AIRMET
Make and Model:	YSI PRO PLUS
Serial Number:	10H100322

CALIBRATION

CALIBRATE WITH CALIBRATION SOLUTIONS

Date and Time:	31/3/21 0700				
Parameter	Acidity		Conductivity	ORP	Dissolved Oxygen
Units	pH	pH	µS/cm	mV ppm	ppm %
Calibration Standard Concentration:	7.00	4.01	2707	233.4	100
Calibration Reading:	7.04	4.10	2751	231.5	101.8
Calibration Temperature:	25.2	25.3	24.3	23.9	23.6

ONGOING CHECKS

BUMP TEST WITH CALIBRATION SOLUTION

Date and Time:	1.4.21 0730 18K 102254				
Parameter	Acidity		Conductivity	Dissolved Oxygen	
Units	pH	pH	µS/cm	ppm %	ppm
Calibration Standard Concentration:	7.01	4.01	2760	99.8	231.6
Bump Test Reading:	7.03	4.06	2805	99.5	232.2
Bump Test Temperature:	24.3	24.9	24.5	23.1	24.5


COMMENTS

Detail any equipment faults, minor maintenance performed, change of batteries or technical support provided.

[Empty space for comments]

Approval and Distribution

Each individual instrument has been inspected and calibrated daily and bump tested as required by fieldwork staff.



 Fieldwork Staff Signature

 1.4.21
 Date

Distribution: Project Central File

ANZ

FQM - Water Quality Meter Calibration Record

Q4AN(EV)-410-FM1

Project Name:	PFAS OMP - LAVARACK	Project Number:	60612487-3.1	
Project Location:	TOWNSVILLE	Client:	DEPT OF DEFENCE	
PM Name:	[REDACTED]	Fieldwork Staff Name:	[REDACTED]	
This calibration record is intended to prompt fieldwork staff to calibrate water quality meter (WQM) daily before the start of fieldworks.				
INSTRUMENT DETAILS				
Supplier:	AECOM			
Make and Model:	YSI PRO DSS			
Serial Number:	1			
CALIBRATION				
CALIBRATE WITH CALIBRATION SOLUTIONS				
Date and Time:	13/5/21 0920.			
Parameter	Acidity		Conductivity	Disolved Oxygen
Units	pH	pH	207 μ S/cm	ORP
Calibration Standard Concentration:	7	4	252	2 MV
Calibration Reading:	7.06	4.15	252 2520	100% 262
Calibration Temperature:	22.8	22.9	22.4	98.5 252.3 24.0 11.6
ONGOING CHECKS				
BUMP TEST WITH CALIBRATION SOLUTION				
Date and Time:				
Parameter	Acidity		Conductivity	Disolved Oxygen
Units	pH	pH	μ S/cm	ppm ppm
Calibration Standard Concentration:				
Bump Test Reading:				
Bump Test Temperature:				
COMMENTS				
Detail any equipment faults, minor maintenance performed, change of batteries or technical support provided.				
Approval and Distribution				
<input type="checkbox"/> Each individual instrument has been inspected and calibrated daily and bump tested as required by fieldwork staff.				
<div style="border: 1px solid black; width: 100%; height: 20px; background-color: black;"></div>			<div style="border: 1px solid black; width: 100%; height: 20px; background-color: black;"></div>	
Distribution: Project Center is			Date	

ANZ

FQM - Water Quality Meter Calibration Record

Q4AN(EV)-410-FM1

Project Name:	FASOMP - LAVARACK		Project Number:	60612487 - 3 - 1	
Project Location:	LAVARACK BARRACKS		Client:	DEPT of DEFENCE	
PM Name:	[Redacted]		Fieldwork Staff Name:	[Redacted]	
This calibration record is intended to prompt fieldwork staff to calibrate water quality meter (WQM) daily before the start of fieldworks.					
INSTRUMENT DETAILS					
Supplier:	AECOM				
Make and Model:	YSI ProDSS				
Serial Number:	18K102334				
CALIBRATION					
CALIBRATE WITH CALIBRATION SOLUTIONS					
Date and Time:	22/6/21				
Parameter	Acidity		Conductivity	Dissolved Oxygen	
Units	pH	pH	µS/cm	ppm %	ppm mV
Calibration Standard Concentration:	7	4	206.9 2674	100	247.5
Calibration Reading:	7.05	4.04	222.1 2179	101.3	256.9
Calibration Temperature:	22.0	22.1	22.1	21.6	12.2
ONGOING CHECKS					
BUMP TEST WITH CALIBRATION SOLUTION					
Date and Time:					
Parameter	Acidity		Conductivity	Dissolved Oxygen	
Units	pH	pH	µS/cm	ppm	ppm
Calibration Standard Concentration:					
Bump Test Reading:					
Bump Test Temperature:					
COMMENTS					
Detail any equipment faults, minor maintenance performed, change of batteries or technical support provided.					
Approval and Distribution					
<input checked="" type="checkbox"/> Each individual instrument has been inspected and calibrated daily and bump tested as required by fieldwork staff.					
[Redacted Signature]			22/6/21		
Fieldwork Staff Signature			Date		
Distribution: Project Central File					

Multi Parameter Water Meter



airmet

Air-Met Scientific Pty Ltd
1300 137 067

Instrument YSI Quatro Pro Plus
Serial No. 10H100322

Item	Test	Pass	Comments
Battery	Charge Condition	✓	
	Fuses	✓	
	Capacity	✓	
Switch/keypad	Operation	✓	
Display	Intensity	✓	
	Operation (segments)	✓	
Grill Filter	Condition	✓	
	Seal	✓	
PCB	Condition	✓	
Connectors	Condition	✓	
Sensor	1. pH	✓	10 meter Cable
	2. mV	✓	
	3. EC	✓	
	4. D.O	✓	
	5. Temp	✓	
Alarms	Beeper		
	Settings		
Software	Version		
Data logger	Operation		
Download	Operation		
Other tests:			

Certificate of Calibration

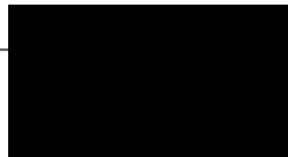
This is to certify that the above instrument has been calibrated to the following specifications:

Sensor	Serial no	Standard Solutions	Certified	Solution Bottle Number	Instrument Reading
1. pH 7.00		pH 7.02	NIST	358580	pH 7.02
2. pH 4.00		pH 4.00	NIST	357330	pH 4.00
3. mV		235.8mV	NIST	358632/354593	235.8mV
4. EC		2760uS	NIST	354263	2761uS
6. D.O		0 ppm	NIST	10959	0 ppm
7. Temp		21.9°C	NIST	Testo Mini901	21.9°C

Calibrated by:

Calibration date: 25/03/2021

Next calibration due: 25/09/2021





Calibration Certificate

AirMet Scientific P/L
 135 Sydney Street
 Mackay
 QLD 4740, Australia
 Tel: 07 4951 7500
 Fax: 07 4951 7575

This document certifies that the instrument detailed has been calibrated to the parameters

Certificate Print Date: 16-Nov-2020 Call ID / Order No: 246888
 Calibration Date: 16-Nov-2020 Job No / Pack No: S2468880001
 Next Calibration Due: 16-Nov-2021

Customer: AECOM Australia Pty Ltd (Townsville)-ID **Serial No:** 18K102334
Description: 407250
 Xylem ProDSS Handheld, No GPS

Calibration Summary

Frequency: 1 Years **Temp:** 24.2°C **As Found:** Out of Tolerance **Result:** Pass
Humidity: 45% **Certificate:** S2468880001

<u>Desc</u>	<u>As Found</u>		<u>As Left (Cal Status)</u>	
	<u>Actual</u>	<u>Result</u>	<u>Actual</u>	<u>Result</u>
PH4 (4.00)	3.91	Pass	4.0	Pass
PH7 (7.01)	6.85	Pass	7.01	Pass
Cond (2707uS/cm)	2773.0	Fail	2707.0	Pass
DO (0.0%)	0.0	Pass	0.0	Pass
Turbidity (100NTU)	110.73	Fail	99.42	Pass
ORP (231.9mV)	277.3	Fail	231.7	Pass

<u>Equip ID</u>	<u>Standard Used Description</u>	<u>Valid Until</u>	<u>Cert</u>
-----------------	----------------------------------	--------------------	-------------

Completed By: _____

Signed: _____

Sampling Event Factual Report, August 2021

PFAS Ongoing Monitoring Program - Lavarack Barracks, Townsville,
QLD

22-Oct-2021
PFAS Ongoing Monitoring Program Lavarack Barracks
Doc No. 60612487

Sampling Event Factual Report, August 2021

PFAS Ongoing Monitoring Program - Lavarack Barracks, Townsville, QLD

Client: Department of Defence Directorate of PFAS Remediation

ABN: 68 706 814 312

Prepared by

AECOM Australia Pty Ltd

Level 5, 7 Tomlins Street, South Townsville Qld 4810, PO Box 5423, Townsville QLD 4810, Australia

T +61 7 4729 5500 www.aecom.com

ABN 20 093 846 925

22-Oct-2021

Job No.: 60612487

AECOM in Australia and New Zealand is certified to ISO9001, ISO14001 AS/NZS4801 and OHSAS18001.

Quality Information

Document Sampling Event Factual Report, August 2021

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1.0 Introduction

1.1 General

AECOM Australia Pty Ltd (AECOM) was engaged by the Department of Defence (Defence) to implement the per- and poly-fluoroalkyl substances (PFAS) Ongoing Monitoring Program (OMP) outlined in the PFAS Management Area Plan (PMAP) (Department of Defence, 2020) at Lavarack Barracks, Townsville (the 'Base') located in the North Queensland Region. The location of the Base and the PFAS Source Areas are shown in **Figure 1** in **Appendix A**. The OMP (Department of Defence, 2020) for Lavarack Barracks includes biannual groundwater, surface water, and sediment sampling events in October 2020, March/April and August in 2021, February/March and August 2022 and February/March 2023.

These sampling events include the following:

- Groundwater sampling of 31 on-Base wells at Lavarack Barracks and nine off-Base wells in the suburbs of Annandale, Idalia and Wulguru.
- Sediment sampling at 18 on-Base locations at Lavarack Barracks and 13 off-Base locations in the Ross River and waterways in Annandale and Idalia with co-located surface water sampling when water is present.

Following each sampling event, a factual report will be prepared. Annual interpretative reports will be prepared following the completion of each 12-month sampling period. This sampling event factual report has been prepared to report the results of the post dry-season sampling event completed in August 2021, specifically highlighting first-time detections and/or first-time exceedances of human health and ecological screening criteria for perfluorooctane sulfonate (PFOS) + perfluorohexane sulfonic acid (PFHxS) and perfluorooctanoic acid (PFOA).

This report has been prepared in accordance with the Defence (2020) PFAS OMP factual report guidance, v0.2, May 2021 (Department of Defence, 2021).

1.2 Objectives

The objectives of the OMP are to:

- Implement the OMP prepared as part of the PMAP; and
- Collect data that will enable Defence to maintain an up to date understanding of the distribution, concentration and transport of PFAS at the Base.

The data will assist in the timely identification of risks and inform Defence's approach to the management of PFAS, including updates and revisions to the PMAP.

The objective of this phase of works is to implement the scope of works for the August 2021 sampling event in accordance with the sampling and analysis quality plan (SAQP) (AECOM, 2021).

2.0 Scope of Work

The sampling event at Lavarack Barracks was completed in general accordance with the SAQP (AECOM, 2021). In summary, the scope of works for this sampling event included:

- Obtaining permission to work in public spaces where some sampling locations are situated.
- Review of the SAQP prior to the monitoring event to ensure compliance with the following:
 - PFAS National Environmental Management Plan (NEMP) (HEPA, 2020);
 - National Environment Protection (Assessment of Site Contamination) Measure 1999, Schedule B1, as amended in 2013 (ASC NEPM, 2013);
 - Defence Routine Environment Water Quality Monitoring Program;
 - AS/NZ 5667:1998 Water quality – Sampling;
 - Australian and New Zealand Guidelines for Fresh and Marine Water Quality; and
 - Relevant State regulatory guidelines.
- Gauging of groundwater level in monitoring wells prior to collection of samples (refer to **Table 1** below, and **Figure 2** in **Appendix A** for specific locations).
- Collection of groundwater samples at 40 locations including 31 on-Base locations, and nine off-Base locations (refer to **Table 1** below, and **Figure 2** in **Appendix A**).
- Collection of co-located surface water and sediment samples at 31 locations including 18 on-Base and 13 off-Base locations (refer to **Table 2** and **Table 3** below, and **Figure 3** in **Appendix A**). It is noted that 11 surface water locations were dry during the sampling round and no surface water samples were collected from these locations. No sediment was present at one of the dry locations (in a cobble drain) therefore a sample was not collected from this location.
- Collection of intra- and inter-laboratory duplicate samples at a rate of one in 10 primary samples, one rinsate sample per fieldwork day, and one trip-blank submitted to the laboratory per sample batch.
- Analysis of all samples for a suite of 28 PFAS analytes at the standard limit of reporting (LOR).
- Data management of all OMP field and laboratory data in the Defence ESdat database.
- Preparation of this Sampling Event Factual Report.

Table 1 Groundwater Sampling Locations

Source Area	Monitoring Well ID
Eastern PFAS Contamination Area	MW018, MW114, MW115, MW116, MW139
Former B Squadron	MW135
Former Fire Station	MW105, MW128
Former Fire Training Area	MW131
Former Helicopter Squadron	MW102
Lavarack Golf Course and Sporting Fields	MW065, MW120, MW121, MW122, MW123I, MW123S
Monocell	MW072, MW074, MW106
Stockpile Designated Area 2	MW141
Suspected Aqueous Film Forming Foam (AFFF) Disposal Area	MW101
Top, Middle and Lower Dams	MW138

Source Area	Monitoring Well ID
Base Boundary – On-Base	MW002, MW003, MW117D, MW117S, MW118, MW119, MW124, MW125I, MW125S
Off-Base	MW205S, MW212, MW217, MW220S, MW226, MW232, MW233, MW235S, MW236S

Table 2 Surface Water Sampling Locations

Source Area	Surface Water Location ID
Eastern PFAS Contamination Area	SW119, SW121
Former Fire Station	SW109 ² , SW110 ²
Lavarack Golf Course and Sporting Fields	SW129 ² , SW130 ²
Top Middle and Lower Dams ¹	SW139, SW140, SW144
Remaining on-Base	SW113 ² , SW120 ²
Base Boundary	SW126 ² , SW128 ² , SW132 ² , SW133 ² , SW134, SW135, SW136 ²
Off-Base	SW203, SW205, SW211, SW212, SW217, SW220, SW227, SW232, SW233, SW242, SW243, SW244, SW245

¹ Location SW144 has been sampled instead of SW137 (which was specified in the SAQP AECOM, 2021)). The reason for the change is provided in **Table 8**.

² Locations were dry at the time of sampling and no surface water sample was collected.

Table 3 Sediment Sampling Locations

Source Area	Sediment Location ID
Eastern PFAS Contamination Area	SD119, SD121
Former Fire Station	SD109, SD110
Lavarack Golf Course and Sporting Fields	SD129, SD130
Top Middle and Lower Dams ¹	SD139, SD140, SD144
Remaining on-Base	SD113, SD120
Base Boundary	SD126, SD128, SD132 ² , SD133, SD134, SD135, SD136
Off-Base	SD203, SD205, SD211, SD212, SD217, SD220, SD227, SD232, SD233, SD242, SD243, SD244, SD245

¹ Location SD144 has been sampled instead of SD137 (which was specified in the SAQP (AECOM, 2021)). The reason for the change is provided in **Table 8**.

² SD132 had high proportion of large cobbles and no sediment was present to be collected from this location.

3.0 Methodology

The methodology used for the August 2021 sampling event was in general accordance with the SAQP (AECOM, 2021) and is summarised below. Deviations from the SAQP are discussed in **Section 3.6**.

3.1 Groundwater Sampling Methodology

The groundwater sampling methodology is outlined in **Table 4** below.

Table 4 Groundwater Sampling Methodology

Item	Details
Groundwater Gauging	<p>Depth to groundwater was measured at the beginning of the sampling round to facilitate gauging all wells within the shallow aquifer on the same day.</p> <p>The depth to groundwater was also measured in each monitoring well immediately prior to the collection of groundwater samples.</p>
Water Quality Parameters	<p>Temperature, electrical conductivity (EC), dissolved oxygen (DO), oxidation reduction potential (ORP), pH and observations of water quality were recorded using a calibrated water quality meter. Equipment calibration certificates for the water quality meter are provided in Appendix F.</p>
Sampling Methodology	<p>Groundwater samples were collected from all monitoring wells using no-purge methodology HydraSleeves™, which were installed within the screened interval of each well (based on a review of the well construction log) for a minimum of 24 hours prior to the sampling round (as detailed in Table T1, Appendix B). For wells without available construction details, HydraSleeves™ were installed at the bottom of the well, consistent with the screened interval for wells installed in the same aquifer. Once sampling was completed, new HydraSleeves™ were deployed in preparation for the next sampling round, with the exception of wells where tree roots could prohibit the retrieval of the HydraSleeves™ in future rounds, as detailed in Table 17. HydraSleeves™ were not installed in monitoring wells which are also sampled as part of the routine Water Quality Monitoring Program.</p>
Quality Assurance/Quality Control (QA/QC) Samples	<p>Field QA/QC samples collected included intra-laboratory duplicate and inter-laboratory duplicate samples (i.e. splits), trip blank samples and rinsate samples. Intra- and inter-laboratory samples were collected at a rate of one per ten primary samples. Trip blanks were prepared in the laboratory by filling sampling containers with laboratory supplied PFAS-free deionised water and were included at a rate of one per batch of samples (excluding private property sampling). Rinsate samples were collected at a rate of one sample per day of sampling when non-dedicated equipment is used by pouring laboratory supplied PFAS-free deionised water over the decontaminated sampling equipment.</p> <p>Refer to Appendix C for assessment of QA/QC sample data.</p>
Sample Analysis	<p>All primary samples were submitted for PFAS suite analysis using the standard levels of detection.</p> <p>ALS Environmental Pty Ltd (ALS) Brisbane, Queensland was used as the primary laboratory. The National Measurement Institute (NMI) of Sydney, NSW was used as the secondary laboratory. ALS and NMI methods for analyses of PFAS in are certified by the National Association of Testing Authorities (NATA).</p> <p>Chain of Custody Forms are presented in Appendix D. Laboratory certificates are presented in Appendix E.</p>

3.2 Surface Water Sampling Methodology

The surface water sampling methodology is outlined in **Table 5** below.

Table 5 Surface Water Sampling Methodology

Item	Details
Water Quality Parameters	Temperature, electrical conductivity (EC), dissolved oxygen (DO), oxidation reduction potential (ORP), pH and observations of water quality were recorded using a calibrated water quality meter. Equipment calibration certificates for the water quality meter are provided in Appendix F .
Sampling Methodology	Samples were collected from immediately below the water surface, with either a sampling pole or directly into laboratory supplied sample containers, to minimise collection of sediment or floating materials in the samples. At each location, a new, laboratory-supplied container was lowered into the water with the cap immediately applied once the container was full. Where the waterway could not be accessed from the bank a telescopic sampler with a decontaminated stainless-steel scoop was used to collect the sample. The sample was immediately transferred into the new laboratory supplied container.
Quality Assurance/Quality Control (QA/QC) Samples	Field QA/QC samples collected included intra-laboratory duplicate and inter-laboratory duplicate samples (i.e. splits), trip blank samples and rinsate samples. Intra- and inter-laboratory samples were collected at a rate of one per ten primary samples. Trip blanks were prepared in the laboratory by filling sampling containers with laboratory supplied PFAS-free deionised water and were included at a rate of one per batch of samples (excluding private property sampling). Rinsate samples were collected at a rate of one sample per day of sampling when non-dedicated equipment is used by pouring laboratory supplied PFAS-free deionised water over the decontaminated sampling equipment. Refer to Appendix C for assessment of QA/QC sample data.
Sample Analysis	All primary samples were submitted for PFAS suite analysis using the standard levels of detection. ALS Brisbane, Queensland was used as the primary laboratory. NMI Sydney, NSW was used as the secondary laboratory. ALS and NMI methods for analyses of PFAS in are certified by NATA. Chain of Custody Forms are presented in Appendix D . Laboratory certificates are presented in Appendix E .

3.3 Sediment Sampling Methodology

The sediment sampling methodology is outlined in **Table 6** below.

Table 6 Sediment Sampling Methodology

Item	Details
Sampling Methodology	Samples representative of potentially deposited sediments were collected from within the water body (if possible) using a piston sediment sampler or with a trowel from the base of drains (where possible). Samples were collected from the surface of the sediment up to a depth of 0.1 m, where this depth was achievable. At each location, a new laboratory supplied container was used for each sample.
Logging	Sediment characteristics were recorded for each sample and are summarised in Table T5, Appendix B .
Quality Assurance/Quality	Field QA/QC samples collected included intra-laboratory duplicate and inter-laboratory duplicate samples (i.e. splits), trip blank samples and rinsate samples. Intra- and inter-laboratory samples were collected at a rate of one per ten primary

Item	Details
Control (QA/QC) Samples	<p>samples. Trip blanks were prepared in the laboratory by filling sampling containers with laboratory supplied PFAS-free deionised water and were included at a rate of one per batch of samples (excluding private property sampling). Rinsate samples were collected at a rate of one sample per day of sampling when non-dedicated equipment is used by pouring laboratory supplied PFAS-free deionised water over the decontaminated sampling equipment.</p> <p>Refer to Appendix C for assessment of QA/QC sample data.</p>
Sample Analysis	<p>All primary samples were submitted for PFAS suite analysis using the standard levels of detection.</p> <p>ALS Brisbane, Queensland was used as the primary laboratory. NMI Sydney, NSW was used as the secondary laboratory. ALS and NMI methods for analyses of PFAS in are certified by NATA.</p> <p>Chain of Custody Forms are presented in Appendix D. Laboratory certificates are presented in Appendix E.</p>

3.4 Adopted Screening Criteria

Adopted screening criteria references national guidance in the form of the PFAS National Environmental Management Plan (NEMP), Defence estate and environmental strategies, and Defence PFAS-specific strategies and guidance. Guidance documents used to assess the dataset include the following:

- PFAS NEMP (HEPA 2020).
- Department of Health (DoH), 2019. *Health Based Guidance Values for PFAS for use in site investigations in Australia*. April 2017 [updated September 2019].
- National Health and Medical Research Council (NHMRC), 2019. *Guidance on PFAS in Recreational Water*. August 2019 (NHMRC 2019).
- *National Environment Protection (Assessment of Site Contamination) Measure 1999, Schedule B1, as amended in 2013* (ASC NEPM).

In accordance with the OMP (Department of Defence, 2020) and SAQP (AECOM, 2021), the adopted PFAS screening criteria to assess the data generated as part of the OMP are presented in **Table 7** below.

Table 7 Summary of Adopted Screening Criteria

Pathway	Compound	Criteria	Comment / Reference
Human Health Receptors			
Drinking Water	PFOS + PFHxS	0.07 µg/L	<p>The values are from the PFAS NEMP (HEPA, 2020). Where the guideline value refers to the sum of PFOS + PFHxS, this includes PFOS only, PFHxS only and the sum of the two (HEPA, 2020).</p> <p><i>All off base groundwater results will be compared to these criteria. as well as one surface water location which is within Townsville's emergency drinking water supply.</i></p>
	PFOA	0.56 µg/L	
Recreational use – surface water	PFOS + PFHxS	2 µg/L	<p>The values are from the PFAS NEMP (HEPA, 2020).</p> <p><i>All surface water results will be compared to these criteria.</i></p>
	PFOA	10 µg/L	

Pathway	Compound	Criteria	Comment / Reference
Ecological Receptors			
Freshwater and marine water (95% species protection values)	PFOS	0.13 µg/L	The values are from the PFAS NEMP (HEPA, 2020).
	PFOA	220 µg/L	<i>All surface water and groundwater results will be compared to these criteria.</i>

There are no human health or ecological guideline values available for sediment.

3.5 Data Quality Objectives and Data Validation

The data quality objectives and data quality indicators adopted for these works are presented in the SAQP (AECOM, 2021).

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

The data validation procedure employed in the assessment of the field and laboratory QA/QC data indicated that the reported analytical results are representative of the sample locations and that the overall quality of the analytical data produced is acceptably reliable for the purpose of this report.

All data collected during this event has been reviewed and uploaded to the Defence ESdat database in accordance with DCMM (Defence, 2018 as amended 2019) Annex L requirements (Department of Defence, 2019).

3.6 Deviations from the SAQP

Table 8 lists the deviations from the SAQP (AECOM, 2021) during this sampling round.

Table 8 Deviation from the SAQP during Dry Season 2021 Sampling Event

SAQP	Dry Season Sampling 2021
Collection of surface water at 31 co-located surface water and sediment locations	Eleven surface water sampling locations were dry (SW109, SW110, SW113, SW120, SW126, SW128, SW129, SW130, SW132, SW133 and SW136) and surface water samples could not be collected from these locations.
Collection of surface water and sediment samples at SW132/SD132	SW132/SD132 was dry and consisted of large cobbles. No sediment or surface water was present during the sampling event and no samples were collected from this location.
Collection of surface water and sediment samples at SW137/SD137 as presented in Figure 3 of the SAQP (AECOM, 2021).	<p>During the previous sampling event it was identified that SW137/SD137 was in the incorrect location compared to the PMAP (Department of Defence, 2020).</p> <p>The update of the SAQP was in progress at the time of the sampling event. Following discussion with Defence, SW137/SD137, as previously displayed on Figure 3 (AECOM, 2021), was removed from the plan and replaced with SW144/SD144 which was sampled this round. SW144/SD144 is located in the top dam and is the intended sampling location in the PMAP (Department of Defence, 2020).</p> <p>These changes are reflected in revision 4 of the SAQP.</p>

4.0 Field Observations and Results

The 2021 dry season sampling event was completed between 16 and 20 August 2021, commencing with groundwater gauging and deployment of HydraSleeves™. The results are summarised in the following sections.

Details on weather conditions and estate management works or training activities during the sampling event are recorded in **Table 9**.

Table 9 Weather Conditions and Estate Activities at Time of Sampling

Item	Observations
Weather Conditions	Weather was warm and sunny during the sampling event.
Estate Management Works or Training Activities	Construction associated with the Land 400 project was underway during the sampling event, at former Building G2731, on the corner of Lachlan Wilson Drive and Gallipoli Drive. This did not impact access to sample locations, however, earthworks in this area have the potential to impact PFAS concentrations in surface water and sediment samples down gradient of the project, near the Base boundary. No other estate management works, or training exercises impacted access to sample groundwater, surface water and sediment locations.

4.1 Groundwater

4.1.1 Observations and Field Measurements

Table 10 Groundwater Observations and Field Measurements

Item	Observations
Access	All monitoring wells were accessible.
Monitoring Well Network	<p>The headworks at the following monitoring wells were noted to be damaged during the 2021 dry season sampling event:</p> <ul style="list-style-type: none"> MW115 was bent at approximately 0.75 metres below top of casing (mBTOC). The well was able to be sampled in this sampling event using a HydraSleeve™ without a collar. MW003 was bent at ground level. The well was able to be sampled in this sampling event using a HydraSleeve™ without a collar. Subsequent works were undertaken on 4 September 2021 to repair the casing and the well was resurveyed on 16 September 2021. Concrete around the monument of MW125S was cracked. Well casing was unaffected, and the well was able to be sampled in this sampling event. The ground had washed away at MW121 and the monument was loose. The well casing was unaffected, and the well was able to be sampled in this sampling event. Well cap was replaced on MW226. Bolts of the gatic cover at MW232 were rusted. New bolts were installed. Tree roots were cleared from MW101 and MW235S prior to installing HydraSleeves™ at the beginning of the round. The ground had washed away at MW233 and the monument was loose. The well casing was unaffected, and the well was able to be sampled in this sampling event. Data loggers were present in MW205S, MW232, MW235S, MW236S. <ul style="list-style-type: none"> Data loggers were removed to deploy HydraSleeves™ and replaced in the well immediately, on top of the HydraSleeve™. The data loggers were removed a second time during retrieval of the HydraSleeves™ and immediately replaced. <p>These damaged headworks are unlikely to impact the data collected or the interpretation of data.</p>

Item	Observations
Field Observations	<p>Groundwater from seven monitoring well locations (MW018, MW101, MW102, MW115, MW135, MW205S and MW212) had a sulphurous odour.</p> <p>Groundwater colour ranged from clear to black/grey (MW122 and MW123S).</p> <p>No other visible or olfactory indications of contamination were observed during the sampling of the monitoring wells.</p> <p>Field observations are presented Table T1 in Appendix B.</p>
Depth to Groundwater	<p>Depth to groundwater ranged between 0.6 and 5.905 metres below top of casing (mBTC). Groundwater elevations were between 0.495 and 24.743 metres Australian Height Datum (mAHD). Groundwater gauging data are presented in Table T1 in Appendix B.</p>
Groundwater Flow Direction	<p>Groundwater contours and inferred groundwater flow directions in August 2021 are shown on Figure 4 in Appendix A. The inferred local groundwater flow direction is to the north across the western portion of the Site and north east in the eastern portion of the Site.</p>
Water Quality Parameters	<p>Groundwater water quality parameters were measured at the time of sampling. The readings are presented in Table T1 in Appendix B and are summarised below:</p> <ul style="list-style-type: none"> • DO results ranged between 0.42 mg/L (MW115) to 5.3 mg/L (MW205S) indicating poorly to well oxygenated conditions. • EC ranged from 481.2 µS/cm (MW123I) to 37,926 µS/cm (MW232) fresh to saline conditions. • pH ranged from 6.19 (MW217) to 7.99 (MW065). pH results generally indicated slightly acidic to slightly alkaline conditions. • ORP ranged from -167.5 mV (MW101) to 229.6 mV (MW205S) indicating moderately to strongly reducing conditions. • Temperature ranged from 22.3°C (MW226) to 28.7°C (MW072).

4.1.2 Groundwater Analytical Results

Of the 40 groundwater wells sampled during this event, 34 samples reported concentrations of PFAS compounds above the laboratory LOR. The PFAS groundwater analytical results from this sampling event are presented in **Table T2** in **Appendix B**. Five off-Base samples exceeded the adopted drinking water guideline for PFOS+PFHxS and 20 samples, both on and off-Base, exceeded the adopted ecological guidelines for PFOS (**Table T2, Appendix B**). No exceedances of the drinking water guideline for PFOA in off-Base groundwater wells were observed and no exceedances of the ecological guideline for PFOA were observed in either on-Base or off-Base wells.

Historical groundwater results are presented in **Table T7, Appendix B**. First-time detections of PFAS compounds during this sampling event are detailed in **Table 11** below and shown on **Figure 5A** in **Appendix A**. No first-time exceedances of guideline concentrations in groundwater were detected in this sampling event.

Groundwater sampling results were within the same order of magnitude as historically reported concentrations. Results were generally within the historical range of concentrations with the exception of MW125S.

Table 11 First-time Detections of PFAS in Groundwater

Type	Groundwater Locations	PFOA concentration (µg/L)		PFOS+PFHxS concentration (µg/L)	
		August 2021	Historical maximum	August 2021	Historical maximum
First-time detections of PFOA or PFOS+PFHxS in groundwater on-Base	MW125S	0.01	<0.01	0.96	0.3
First-time detections of PFOA or PFOS+PFHxS in groundwater off-Base	There were no first-time detections in off-Base groundwater samples.				

Concentrations have been rounded to two decimal places.

¹ Blue cells denote first time detection above LOR.

4.2 Surface Water

4.2.1 Observations and Field Measurements

Table 12 Surface Water Observations and Field Measurements

Item	Observations
Access	All surface water locations were accessible during the sampling event. SW109, SW110, SW113, SW120, SW126, SW128, SW129, SW130, SW132, SW133 and SW136 were dry at the time of sampling, no surface water was collected from these locations.
Field Observations	Surface water from two locations (SW139 and SW212) had a sulfurous odour. Surface water from three locations (SW119, SW134 and SW135) had a slight organic odour. Surface water from five locations (SW134, SW135, SW203, SW211 and SW217) had slight biological sheen on the surface. No other visible or olfactory indications of contamination were observed during the sampling of the surface water locations. Field observations are presented Table T3 in Appendix B .
Water Quality Parameters	Surface water quality parameters were measured at the time of sampling. The readings are presented in Table T3 in Appendix B and are summarised below: <ul style="list-style-type: none"> • DO results ranged between 0.31 mg/L (SW121) and 12.31 mg/L (SW119) indicating moderately to well oxygenated conditions. • EC ranged from 251.8 µS/cm (SW144) to 48,932 µS/cm (SW243) fresh to saline conditions. • pH ranged from 6.42 (SW232) to 9.15 (SW119). pH results generally indicated near neutral to alkaline conditions. • ORP ranged from -52 mV (SW203) to 222.1 mV (SW243) indicating moderately to strongly reducing conditions. • Temperature ranged from 21.3°C (SW203) to 25.4°C (SW212).

4.2.2 PFAS Surface Water Analytical Results

Of the 20 surface water samples, 12 samples reported concentrations of PFAS compounds above the laboratory LOR. The PFAS surface water analytical results from this sampling event are presented in **Table T4** in **Appendix B**. PFOS concentrations in eight samples exceeded the adopted ecological guidelines and PFOS+PFHxS concentrations in three samples exceeded the adopted recreational use

guidelines (**Table T4, Appendix B**). There were no exceedances of adopted guidelines for PFOA in surface water.

Historical surface water results presented in **Table T8, Appendix B**. First-time detections of PFAS compounds are detailed in **Table 13** below and presented on **Figure 5B** in **Appendix A**.

Surface water sampling results were generally within the historical range of concentrations with the exception of SW212.

Table 13 First-time Detections of PFAS in Surface Water

Type	Surface Water Locations	PFOA concentration (µg/L)		PFOS+PFHxS concentration (µg/L)	
		August 2021	Historical maximum	August 2021	Historical maximum
First-time detections of PFOA or PFOS+PFHxS in surface water on-Base	There were no first-time detections in on-Base surface water.				
First-time detections of PFOA or PFOS+PFHxS in surface water off-Base	SW212	0.02	<0.01	0.11	0.28

Concentrations have been rounded to two decimal places.

¹ Blue cells denote first time detection above LOR.

4.3 Sediment

4.3.1 Observations and Field Measurements

Table 14 Sediment Observations

Item	Observations
Access	All sediment sampling locations were accessible. SD132 consisted of large cobbles and no sediment was present. No sediment sample was collected at this location.
Field Observations	Sediment at two locations (SD139 and SD212) had a sulfurous odour. No other visible or olfactory indications of contamination were observed during the sampling of sediment locations. Sediment logging and observation data are presented in Table T5, Appendix B .

4.3.2 PFAS Sediment Analytical Results

Of the 30 sediment samples, 26 samples reported concentrations of PFAS compounds above the laboratory LOR. The PFAS sediment analytical results from this sampling event are presented in **Table T6** in **Appendix B**.

Historical sediment results presented in **Table T9, Appendix B**. First-time detections of PFOA and PFOS+PFHxS in sediment are presented in **Table 15** below and on **Figure 5C** in **Appendix A**.

Sediment sampling results were generally within the historical range of concentrations with the exception of SD205 and SD220.

There are no endorsed human health or ecological guideline values available for sediment.

Table 15 First-time Detections of PFAS in Sediment

Sediment Locations	PFOA concentration (mg/kg)	PFOS+PFHxS concentration (mg/kg)
SD205	0.0002	0.0019
SD220	0.0003	0.0410

Concentrations have been rounded to four decimal places.

*Blue cells denote first time detection above LOR.

5.0 Well Network Repairs

Well network repairs were completed during and following the August 2021 sampling event. These repairs are detailed in **Table 16** below.

Table 16 Well Network Repairs

Repair Required	Date Completed	Comments
Monument and casing at MW003 were bent at approximately ground level. The bend in the casing prohibited using HydraSleeves™ with collar for sampling. This required replacement of casing from the bend and resurvey of top of casing level.	Repairs completed 4 September 2021. Well resurveyed 16 September 2021.	The original monument was filled with cement and could not be reused. A new monument was installed. Top of casing survey level has been updated in Defence ESdat.
Well cap at MW226 was missing and required replacement. This was completed during sampling of the well.	19 August 2021	N/A
Bolts of the gatic cover at MW232 were rusted. New bolts were installed.	20 August 2021	N/A

6.0 Summary and Next Sampling Event

6.1 Summary of Monitoring Event

The dry season monitoring event was completed between 16 and 20 August 2021 at the Base and surrounding suburbs and included sampling of groundwater, surface water and sediment. **Table 17** summarises findings of the August 2021 sampling event and the recommended actions.

Table 17 Summary of Sampling Event

Item	Comment	Recommended Actions
Groundwater: Access to sampling locations and monitoring well network condition.	All of the 40 monitoring well locations were accessible and able to be sampled.	Ongoing monitoring in accordance with the OMP.
	The casing of MW003 and MW115 was bent below ground level. A sample was collected using a HydraSleeve™ without a collar.	MW003 has since been repaired and can be monitored as normal. Continue monitoring MW115 using a HydraSleeve™ without a collar.
	The monument of MW121 and MW233 was loose due to a wash out of the ground below the concrete plinth. The concrete plinth at the base of the monument of MW125S is cracked.	Repair concrete plinth on MW121, MW125S and MW233.
	Sediment was present in HydraSleeves™ retrieved from MW065, MW122, MW123S, MW123I and MW217.	Develop these wells to remove sediment prior to HydraSleeve™ deployment in the next round.
	Data loggers were present in the following off-Base wells: <ul style="list-style-type: none"> MW205S MW232 MW235S MW236S. Data loggers were removed to deploy HydraSleeves™ and replaced in the well immediately, on top of the HydraSleeve™. The data loggers were removed a second time during retrieval of the HydraSleeves™ and immediately replaced. A note was left for the owner of the data loggers in each well collar detailing date and time of removal and contact information. HydraSleeves™ were not redeployed in wells with data loggers.	Defence has advised that the owner of the data loggers is unknown. It is recommended that the data loggers be removed and the data downloaded. AECOM to deploy HydraSleeves™ in these wells at the beginning of the subsequent sampling round.
	HydraSleeves™ were not redeployed in the following wells due to conflict with the routine Water Quality Monitoring Program: <ul style="list-style-type: none"> MW002 MW003 MW072 MW074 	AECOM to deploy HydraSleeves™ in these wells at the beginning of the subsequent sampling round.
	HydraSleeves™ were not redeployed in the following wells due to potential for tree roots to prohibit retrieval of the HydraSleeve™: <ul style="list-style-type: none"> MW101 MW131 	AECOM to deploy HydraSleeves™ in these wells at the beginning of the subsequent sampling round.

Item	Comment	Recommended Actions
<p><u>Sediment/Surface Water:</u> Access to sampling locations.</p>	<p>All 31 surface water and sediment locations were accessible.</p> <p>SW109, SW110, SW113, SW120, SW126, SW128, SW129, SW130, SW132, SW133 and SW136 were dry at the time of sampling, no surface water was collected from these locations.</p> <p>SD132 consisted of large cobbles and no sediment or surface water was present. No sample was collected at this location.</p>	<p>Continue monitoring in accordance with the OMP.</p> <p>SW132/SD132 should be revisited at the next sampling event to assess for presence of sediment.</p>
<p><u>Analytical Results</u></p>	<p>PFAS compounds were detected at concentrations exceeding the laboratory LOR in 34 groundwater samples, 12 surface water samples and 26 sediment samples.</p>	<p>Continue monitoring in accordance with the OMP.</p>
<p><u>First-time detections of PFOA or PFOS+PFHxS</u></p>	<p><u>Groundwater:</u> PFOA was detected for the first time at on-Base groundwater monitoring well MW125S during this sampling round.</p> <p><u>Surface Water:</u> Results showed a first-time detection of PFOA at one off-Base sampling locations (SW212) during this sampling round.</p> <p><u>Sediment:</u> PFOA was detected for the first time at two off-Base (SD205 and SD220) sediment sampling locations during this sampling round.</p>	<p>Continue monitoring in accordance with the OMP.</p>
<p><u>First-time exceedances of screening criteria for PFOS, PFOA or PFOS+PFHxS</u></p>	<p>There were no first-time exceedances of guidelines detected in groundwater, surface water or sediment.</p>	<p>Continue monitoring in accordance with the OMP.</p>

6.2 Upcoming Sampling Events

The next biannual sampling event is scheduled for February/March 2022.

6.3 Upcoming Annual Interpretive Report

The next annual interpretive report is scheduled for January 2022.

7.0 References

AECOM. (2021). *Sampling Analysis and Quality Plan - PFAS OMP Lavarack Barracks (Revision 3)*.

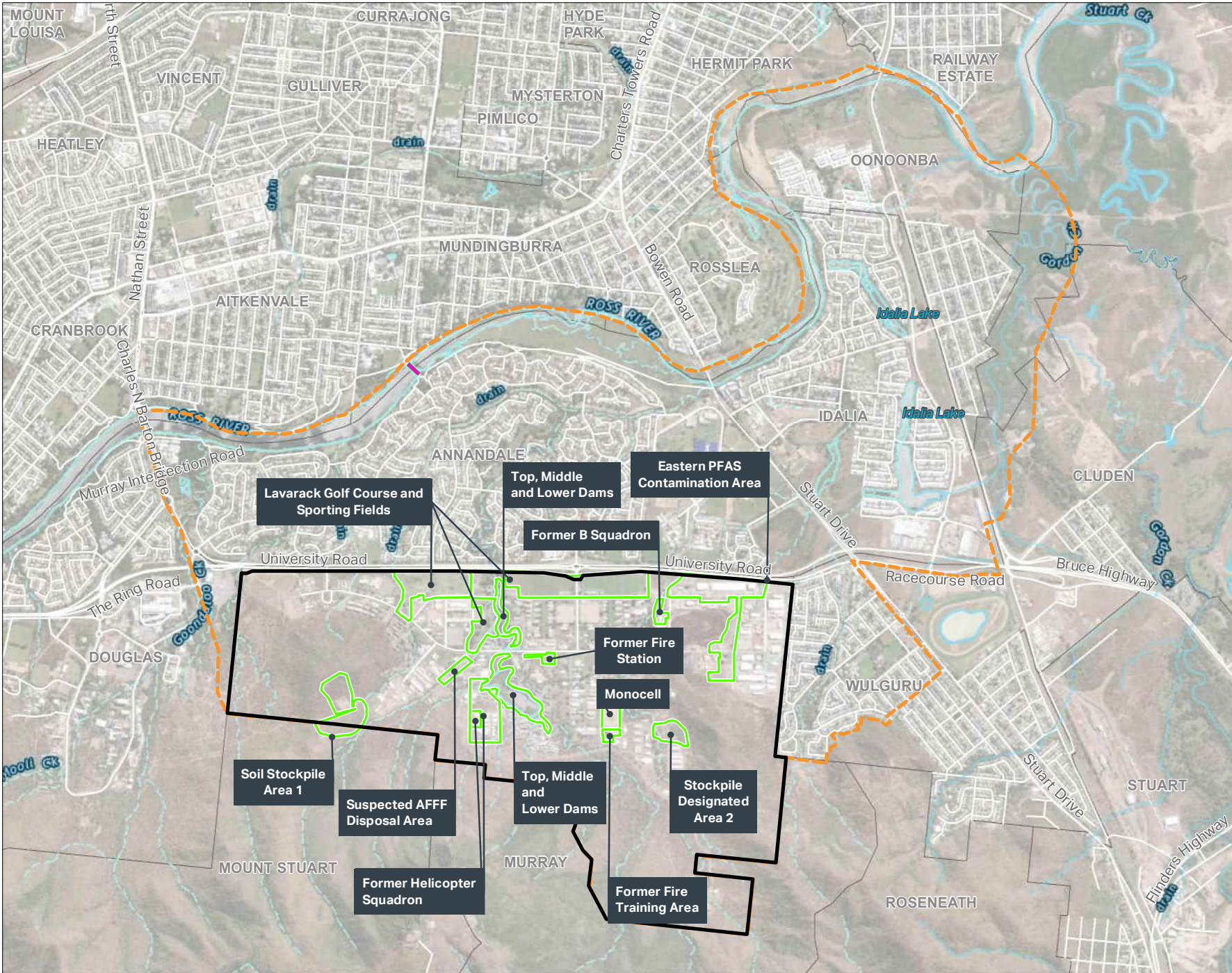
Department of Defence. (2019). *Defence Contamination Management Manual, Annex L: Guidance on Data Management*.

Department of Defence. (2020). PFAS Management Area Plan - Lavarack Barracks, Townsville.

Department of Defence. (2021). PFAS OMP Factual Reports Guidance v0.2 [revised May 2021].

Appendix A

Figures



- Legend
- Property Boundary
 - Management Area
 - Aplin's Weir
 - Source Areas
 - Watercourses

**FIGURE 1:
LAVARACK BARRACKS
LOCATION AND
SOURCE AREAS**

PROJECT NAME:
PFAS OMP
REPORT NAME:
PFAS OMP – Lavarack Barracks
(0229) Townsville,
Sample Event Factual Report
August 2021
CLIENT NAME:
Department of Defence
PROJECT NUMBER:
60612487

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Legend

- Property Boundary
- Management
- Aplin's Weir
- Source
- Watercourses
- On-Base Monitoring Well
- Off-Base Monitoring Well
- Tidally Influenced Groundwater Sample Location

**FIGURE 2:
GROUNDWATER
MONITORING LOCATIONS**

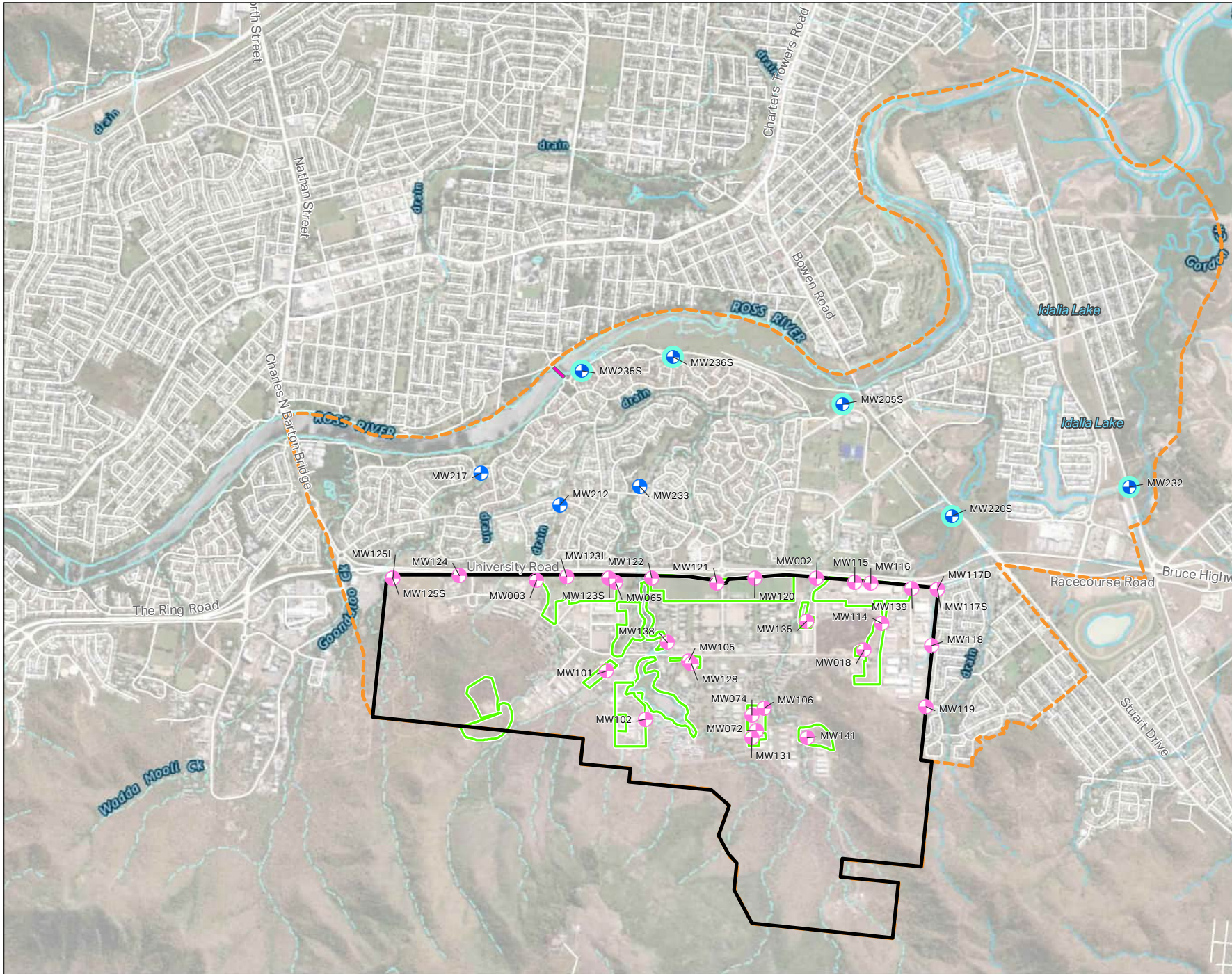
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PFAS OMP
REPORT NAME:
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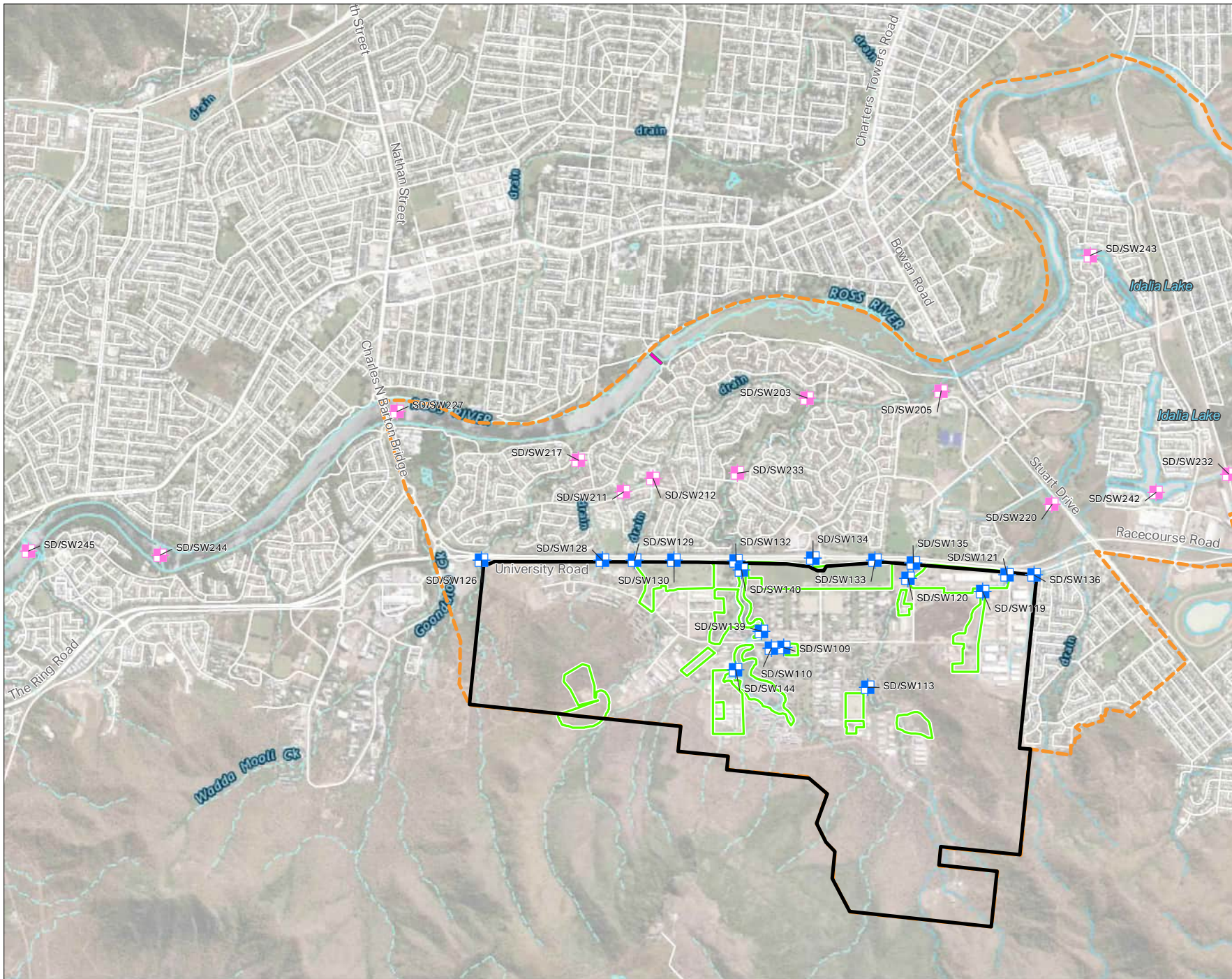
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Legend

- Property Boundary
- Management Area
- Aplin's Weir
- Source Areas
- Watercourses
- On-Base Co-located Surface Water and Sediment Sample Location
- Off-Base Co-located Surface Water and Sediment Sample Location



**FIGURE 3:
SURFACE WATER AND
SEDIMENT MONITORING
LOCATIONS**

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Legend

- Property Boundary
- Management Area
- Aplin's Weir
- Source Areas
- Watercourses
- Groundwater Contour
- Inferred Groundwater Flow Direction
- Groundwater Monitoring Well

Note: All elevations are in m AHD

**FIGURE 4:
INFERRED
GROUNDWATER
CONTOURS- SHALLOW
AQUIFER (ALLUVIUM)**

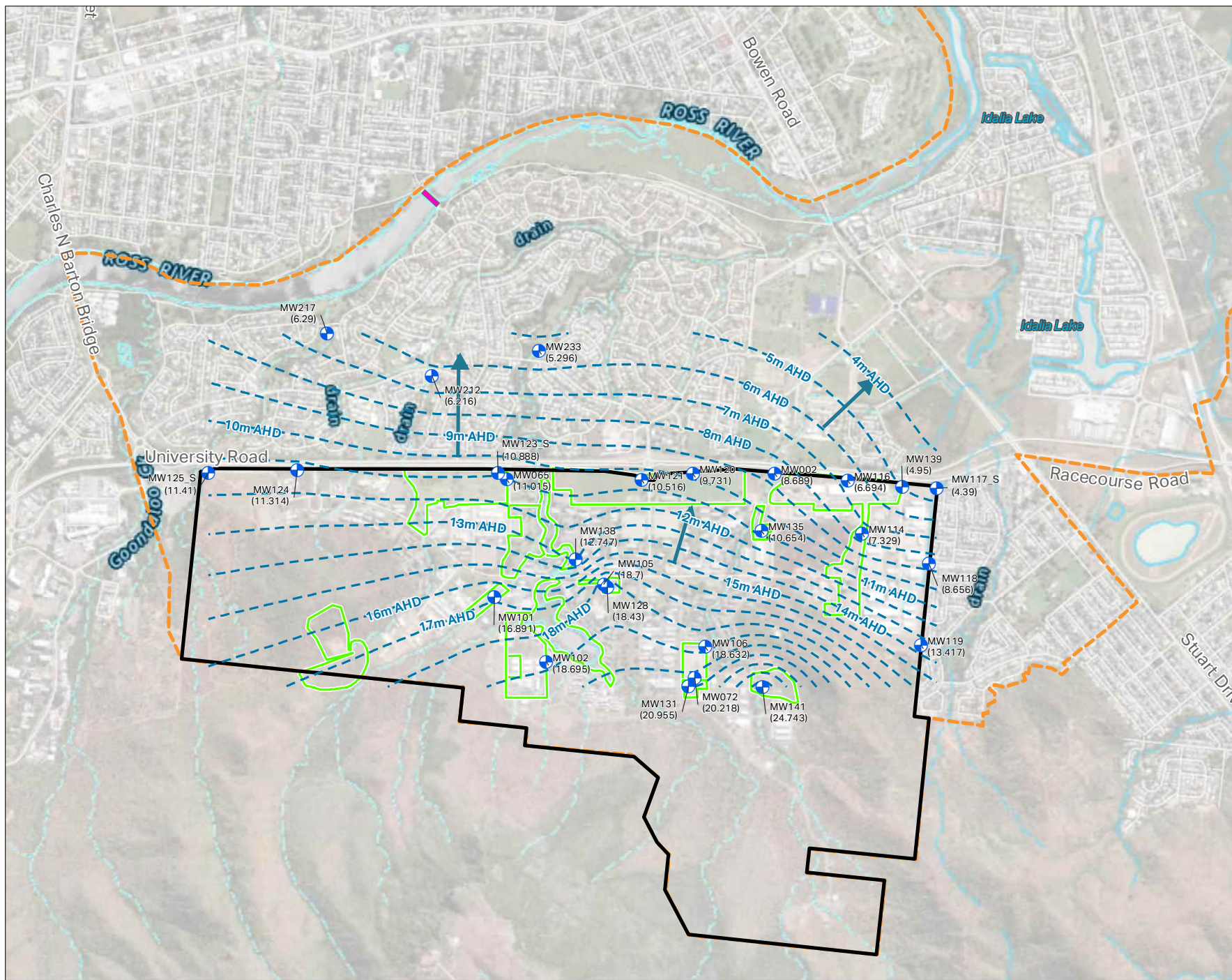
PROJECT NAME:
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Legend

Management Area

Sub-Management Area Boundary

Aplin's Weir

Source Areas

First time detection of PFOA above laboratory limit of reporting

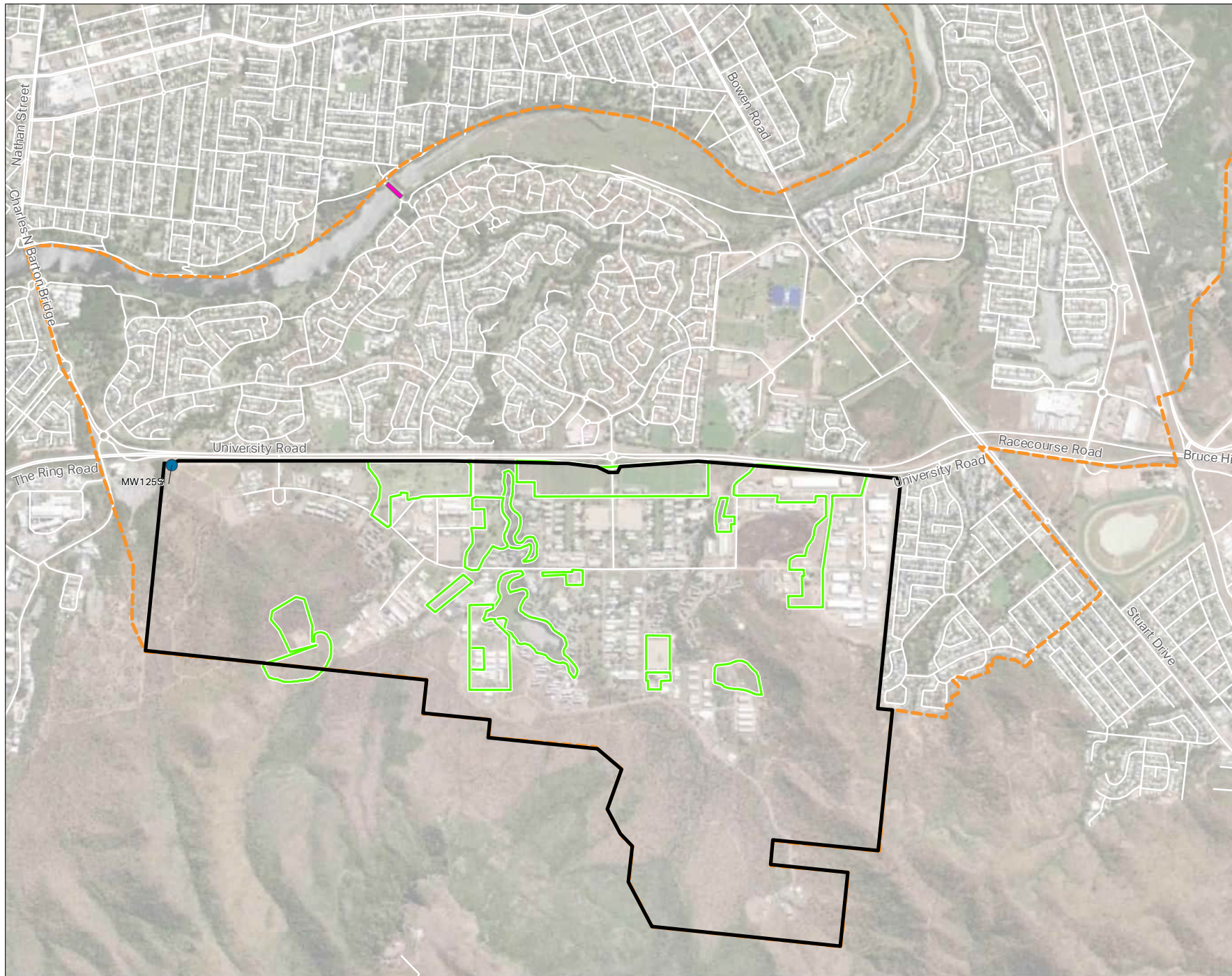


FIGURE 5A:
GROUNDWATER, FIRST TIME PFAS DETECTION

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Legend

- Property Boundary
- Management Area
- Aplin's Weir
- Source Areas

First time detection of PFOA above laboratory limit of reporting

-

**FIGURE 5B:
SURFACE WATER,
FIRST TIME PFAS
DETECTION**

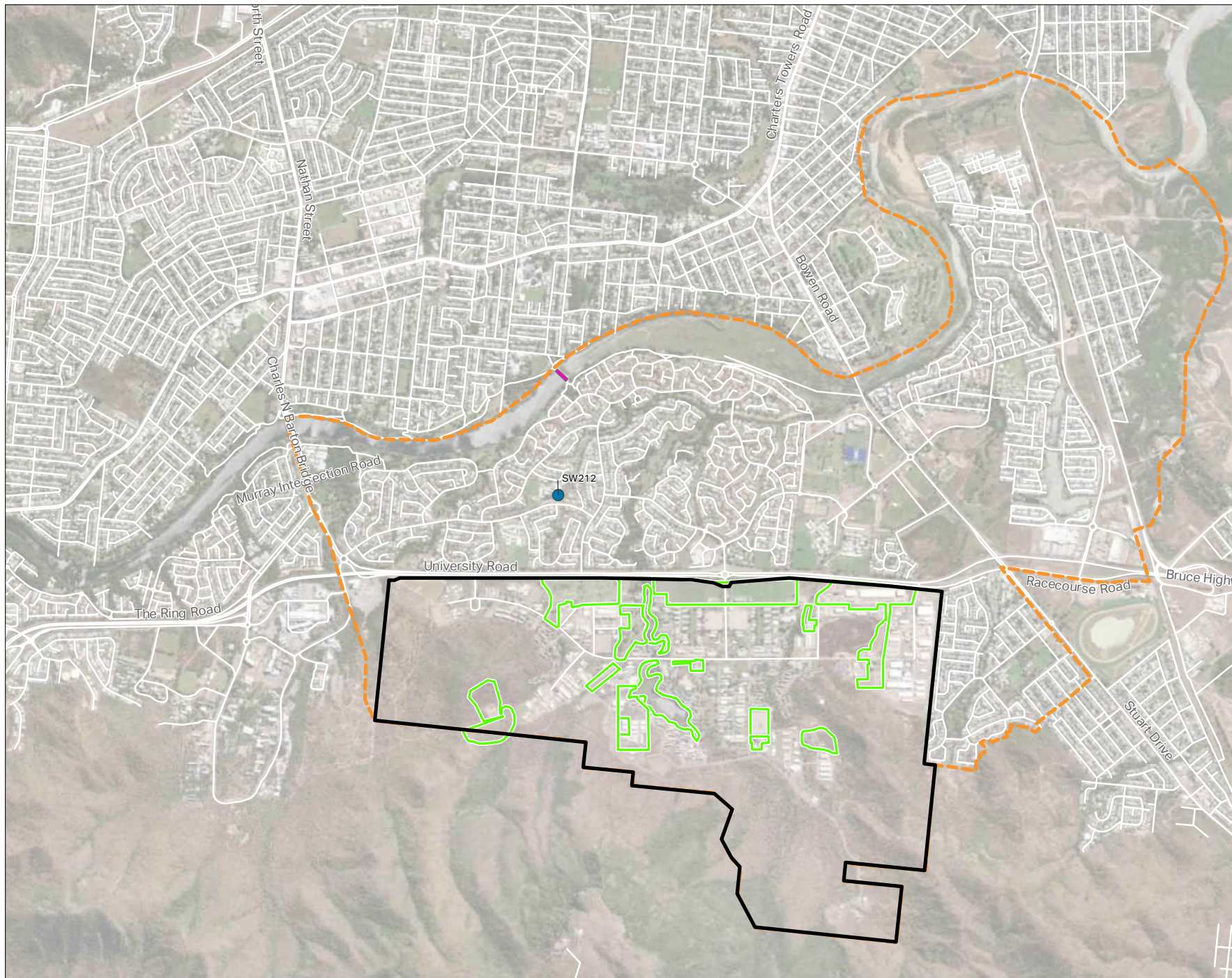
PROJECT NAME:
PFAS OMP
REPORT NAME:
PFAS OMP – Lavarack Barracks
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Legend

- Management Area
- Sub-Management Area Boundary
- Aplin's Weir
- Source Areas

First time detection of PFOA above laboratory limit of reporting

-

**FIGURE 5C:
SEDIMENT,
FIRST TIME PFAS
DETECTION**

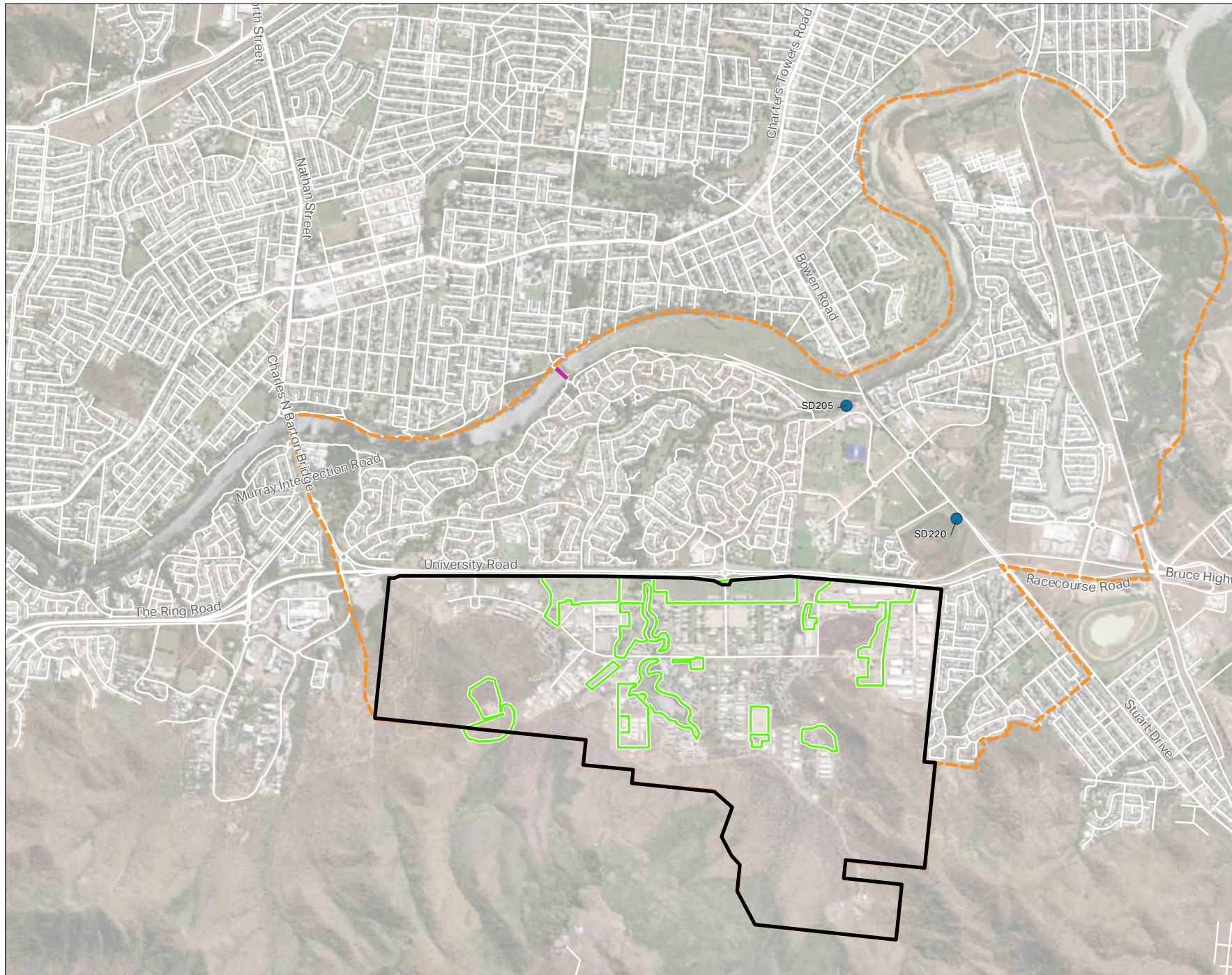
PROJECT NAME:
PFAS OMP
REPORT NAME:
PFAS OMP – Lavarack Barracks
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Appendix B

Results Tables

Location Code	HydraSleeve Installation Date	Gauging Date and Time	Sample Date	Well Screen Depths (mbtoc)	Well Depth (mbtoc)	Depth to Water (mbtoc)	HydraSleeve Installation Depth (mbTOC)*	TOC Elevation (mAHD)	Groundwater Elevation (mAHD)	Condition of Well	DO (mg/L)	EC (µS/cm)	pH	Eh/Redox (mV)	Temp (°C)	Turbidity	Water Colour	Odour	Sheen	Sample Method/Comments
Eastern PFAS Contamination Area																				
MW018	31/03/2021	17/08/21 10:55:20	18/08/2021	Not available in ESdat	9.05	3.112	7.75	12.43	9.318	Good	0.77	20667	7.05	-94	25	Clear	Clear	Weak sulfurous odour	No sheen	HydraSleeve
MW114	31/03/2021	17/08/21 11:03:58	18/08/2021	Not available in ESdat	6.68	1.571	5.38	8.9	7.329	Good	1.94	17690	7.45	77.3	27.8	Clear	Clear	No odour	No sheen	HydraSleeve
MW115	31/03/2021	17/08/21 14:03:18	18/08/2021	12.7 - 15.7	15.62	2.258	14.32	9.76	7.502	Damaged	0.42	714	7.57	-157.3	27.6	Low	Light Brown	Strong sulfurous odour	No sheen	HydraSleeve without collar. Casing bent approximately 0.75 mbTOC.
MW116	31/03/2021	17/08/21 13:57:13	18/08/2021	5 - 8	7.88	1.916	6.58	8.61	6.694	Good	2.8	14891	7.42	228.8	27.2	Clear	Clear	No odour	No sheen	HydraSleeve
MW139	31/03/2021	17/08/21 11:16:26	18/08/2021	2.8 - 5.8	5.76	1.58	4.46	6.53	4.95	Good	3.19	4655	6.8	53.2	27	Low	Clear	No odour	No sheen	HydraSleeve
Former B Squadron																				
MW135	31/03/2021	17/08/21 10:44:12	18/08/2021	3 - 6	6.365	4.306	5.065	14.96	10.654	Good	1.23	2964	6.59	41.4	27.2	Low	Grey / Brown	Weak sulfurous odour	No sheen	HydraSleeve.
Former Fire Station																				
MW105	31/03/2021	17/08/21 10:29:33	18/08/2021	3 - 6	6.29	2.5	4.99	21.2	18.7	Good	0.83	3845	7.18	100.1	27.2	Medium	Yellow / Brown	No odour	No sheen	HydraSleeve.
MW128	31/03/2021	17/08/21 10:30:09	18/08/2021	2.6 - 5.6	5.47	2.85	4.17	21.28	18.43	Good	0.64	1142	7.64	77.6	25.9	Clear	Clear	No odour	No sheen	HydraSleeve.
Former Fire Training Area																				
MW131	31/03/2021	17/08/21 12:38:42	19/08/2021	5.4 - 8.4	8.7	4.285	7.4	25.24	20.955	Good	0.86	1049	6.77	93.7	24.5	Clear	Clear	No odour	No sheen	HydraSleeve.
Former Helicopter Squadron																				
MW102	31/03/2021	17/08/21 10:14:04	18/08/2021	8.5 - 14.5	9.81	4.175	8.51	22.87	18.695	Good	1.89	9119	7.45	64.1	26.8	Medium	Yellow / Brown	Weak sulfurous odour	No sheen	HydraSleeve.
Lavarack Golf Course & Sporting Field																				
MW065	31/03/2021	17/08/21 13:07:05	18/08/2021	1.5 - 6	6.5	2.405	5.2	13.42	11.015	Good	3.91	2715	7.99	66.6	27.3	Clear	Clear	No odour	No sheen	HydraSleeve. Small amount of sediment in the bottom of the HydraSleeve.
MW120	31/03/2021	17/08/21 11:42:08	18/08/2021	4 - 7	7.58	3.589	6.28	13.32	9.731	Good	3.41	10168	6.79	4.9	25.3	Low	Clear	No odour	No sheen	HydraSleeve.
MW121	31/03/2021	17/08/21 13:35:51	18/08/2021	2.5 - 5.8	6.39	3.154	5.09	13.67	10.516	Monument wobbles, ground has washed away under concrete plinth.	4.06	6498	7.47	50.2	25.2	Clear	Clear	No odour	No sheen	HydraSleeve. Casing and monument in good condition, ground washed away under concrete plinth, well wobbles.
MW122	31/03/2021	17/08/21 11:52:54	18/08/2021	9.3 - 16.3	16.9	4.626	15.6	14.44	9.814	Good	2.36	4628	7.15	-100.3	27.2	Medium	Black / Grey	No odour	No sheen	HydraSleeve. Sediment in bottom third of HydraSleeve.
MW123I	31/03/2021	17/08/21 12:37:17	18/08/2021	5.8 - 8.8	10.11	2.639	8.81	14.04	11.401	Good	2.9	481.2	6.77	-7.3	25.1	Clear	Clear	No odour	No sheen	HydraSleeve. Sediment in the bottom of the HydraSleeve.
MW123S	31/03/2021	17/08/21 12:56:47	18/08/2021	1 - 5	5.6	2.592	4.3	13.48	10.888	Good	3.5	3597	7.74	51.9	24.6	Medium	Black / Grey	No odour	No sheen	HydraSleeve. Black/grey sediment in bottom of HydraSleeve. Ants in well.

Location Code	HydraSleeve Installation Date	Gauging Date and Time	Sample Date	Well Screen Depths (mbtoc)	Well Depth (mbtoc)	Depth to Water (mbtoc)	HydraSleeve Installation Depth (mbTOC)*	TOC Elevation (mAHD)	Groundwater Elevation (mAHD)	Condition of Well	DO (mg/L)	EC (µS/cm)	pH	Eh/Redox (mV)	Temp (°C)	Turbidity	Water Colour	Odour	Sheen	Sample Method/Comments
Monocell																				
MW072	31/03/2021	17/08/21 12:45:00	20/08/2021	Not available in ESdat	7.928	5.212	6.628	25.43	20.218	Good	2.53	2626	7	-13.5	28.7	Clear	Clear	No odour	No sheen	HydraSleeve.
MW074	31/03/2021	17/08/21 13:51:58	19/08/2021	Not available in ESdat	7.13	4.151	5.83	Not available in ESdat	N/A	Good	1.33	1757	7.13	127.6	27.4	Clear	Clear	No odour	No sheen	HydraSleeve.
MW106	31/03/2021	17/08/21 13:38:44	18/08/2021	2.5 - 8.5	10.14	5.208	8.84	23.84	18.632	Good	2.28	2580	6.93	96.3	26.9	Clear	Clear	No odour	No sheen	HydraSleeve.
Stockpile Designated Area 2																				
MW141	31/03/2021	17/08/21 13:21:38	17/08/2021	Not available in ESdat	8.815	3.447	7.515	28.19	24.743	Good	2.48	1386	6.92	55.9	27.5	Clear	Clear	No odour	No sheen	HydraSleeve.
Suspected AFFF Disposal Area																				
MW101	31/03/2021	17/08/21 10:03:52	18/08/2021	5 - 9	6.87	4.339	5.57	21.23	16.891	Good	1.18	1254	6.69	-167.5	28.3	Turbid	Yellow / Brown	Weak sulfurous odour	No sheen	HydraSleeve.
Top, Middle and Lower Dams																				
MW138	31/03/2021	17/08/21 12:10:47	18/08/2021	6 - 9	9.07	3.743	7.77	16.49	12.747	Good	2.12	3174	7.17	81.9	25.8	Low	Yellow / Brown	No odour	No sheen	HydraSleeve.
Base Boundary																				
MW002	31/03/2021	17/08/21 09:31:46	19/08/2021	Not available in ESdat	5.21	2.661	3.91	11.35	8.689	Good	1.01	2208	6.95	131	25.7	Clear	Clear	No odour	No sheen	HydraSleeve.
MW003	31/03/2021	17/08/21 09:00:41	18/08/2021	Not available in ESdat	30.83	3.44	29.53	13.95	10.51	Damaged	3.81	6710	7.29	59.1	27.7	Clear	Clear	No odour	No sheen	HydraSleeve without collar. Well casing bent at ground level. HydraSleeve not redeployed.
MW117D	30/03/2021	17/08/21 15:55:57	17/08/2021	15 - 20	19.75	2.02	18.45	5.95	3.93	Good	0.91	10934	6.72	-96.1	27.5	Low	Clear	No odour	No sheen	HydraSleeve.
MW117S	30/03/2021	17/08/21 15:31:10	17/08/2021	2.9 - 5.9	5.85	1.57	4.55	5.96	4.39	Good	1.53	9655	7.71	61.5	26.3	Low	Clear	No odour	No sheen	HydraSleeve.
MW118	30/03/2021	17/08/21 09:30:00	17/08/2021	3 - 6	6.02	1.884	4.72	10.54	8.656	Good	0.44	6469	7.22	87.5	27.4	Medium	Clear	No odour	No sheen	HydraSleeve.
MW119	30/03/2021	17/08/21 09:12:20	17/08/2021	5.4 - 10.4	10.41	5.363	9.11	18.78	13.417	Good	0.52	9385	6.81	225.5	25.5	Clear	Clear	No odour	No sheen	HydraSleeve.
MW124	31/03/2021	17/08/21 11:44:08	17/08/2021	3 - 6	7.89	3.096	6.59	14.41	11.314	Good	0.9	29866	7.06	51.4	28.4	Low	Light Yellow / Brown	No odour	No sheen	HydraSleeve.
MW125I	31/03/2021	17/08/21 10:55:53	17/08/2021	5.8 - 8.8	21.92	5.425	20.62	16.67	11.245	Good	1.08	4207	6.88	86	28.6	Low	Light Grey	No odour	No sheen	HydraSleeve.
MW125S	31/03/2021	17/08/21 10:49:58	17/08/2021	1 - 5	7.71	5.27	6.41	16.68	11.41	Damaged	1.35	4902	7.16	65.2	27.7	Clear	Clear	No odour	No sheen	HydraSleeve. Casing and monument in good condition, concrete plinth cracked at base.

Location Code	HydraSleeve Installation Date	Gauging Date and Time	Sample Date	Well Screen Depths (mbtoc)	Well Depth (mbtoc)	Depth to Water (mbtoc)	HydraSleeve Installation Depth (mbTOC)*	TOC Elevation (mAHD)	Groundwater Elevation (mAHD)	Condition of Well	DO (mg/L)	EC (µS/cm)	pH	Eh/Redox (mV)	Temp (°C)	Turbidity	Water Colour	Odour	Sheen	Sample Method/Comments
Off-Base																				
MW205S	31/03/2021	17/08/21 15:57:00	19/08/2021	8 - 11	8.8	5.905	7.5	6.4	0.495	Good	5.3	12110	6.38	229.6	25.4	Clear	Clear	Weak sulfurous odour	No sheen	HydraSleeve. Data logger in well, HydraSleeve not redeployed.
MW212	31/03/2021	17/08/21 10:48:24	18/08/2021	6 - 9	8.86	2.094	7.56	8.31	6.216	Good	0.99	10913	7.08	-83.8	25.3	Turbid	Light Yellow / Brown	Distinct sulfurous odour	No sheen	HydraSleeve.
MW217	31/03/2021	17/08/21 11:14:44	18/08/2021	3 - 6	5.45	1.06	4.15	7.35	6.29	Good	2.86	10963	6.19	39.3	24.7	Turbid	Brown	No odour	No sheen	HydraSleeve. Sediment in bottom of HydraSleeve.
MW220S	1/04/2021	17/08/21 15:33:58	18/08/2021	2 - 5	6.02	2.159	4.72	3.75	1.591	Good	2.74	32869	6.53	51	25.1	Clear	Clear	No odour	No sheen	HydraSleeve.
MW226	30/03/2021	17/08/21 14:46:12	19/08/2021	Not available in ESdat	5.85	1.179	4.55	Not available in ESdat	N/A	Good	0.72	13807	6.74	214.9	22.3	Clear	Clear	No odour	No sheen	HydraSleeve. End cap replaced. Well protected by plastic dog kennel and fence.
MW232	31/03/2021	17/08/21 14:14:03	20/08/2021	1 - 4	3.03	0.6	1.73	2.31	1.71	Good	3.25	37926	6.23	-72.9	25.6	Turbid	Brown	No odour	No sheen	HydraSleeve.
MW233	31/03/2021	17/08/21 14:14:52	18/08/2021	4.2 - 7.2	7.56	1.574	6.26	6.87	5.296	Monument wobbles, ground has washed away under concrete plinth.	0.97	5588	6.95	72.6	24.1	Low	Yellow / Brown	No odour	No sheen	HydraSleeve. Ants in well.
MW235S	31/03/2021	00/01/00 12:00:30	18/08/2021	4.1 - 8.1	7.94	5.372	6.64	7.08	1.708	Good	2.86	1387	6.82	-54.4	26	Medium	Brown	No odour	No sheen	HydraSleeve. Data logger in well.
MW236S	31/03/2021	17/08/21 17:01:00	19/08/2021	4 - 7	6.92	4.961	5.62	6.53	1.569	Good	0.85	1594	6.32	136.2	24.2	Turbid	Orange / Brown	No odour	No sheen	HydraSleeve.

mbtoc - metres below top of casing
 TOC - top of casing
 mAHD - metres above Australian Height Datum
 DO - Dissolved Oxygen
 EC - Electrical Conductivity
 Eh - Redox Oxidation Potential
 Temp - Temperature
 mg/L - milligrams per litre

µS/cm - microsiemens per centimeter
 °C - degrees Celcius
 "-" denotes no analysis taken
 mV - millivolt

* Depth at which collar of the HydraSleeve was installed. Length of HydraSleeve = 1.3 m

Table with columns for PFAS Full Suite analytes (4:2 Fluorotelomer sulfonic acid, 6:2 Fluorotelomer sulfonate, etc.) and summary rows for LOR and PFAS NEMP 2020 guidelines.

Main data table with columns: Location, Sample ID, Sampled Date, and 29 PFAS analytes. Includes sections for Eastern PFAS Contamination Area, Former B Squadron, Former Fire Station, etc.

LOR is limit of reporting
µg/L is micrograms per litre
< denotes concentration is less than
PFAS NEMP 2020 Drinking Water guideline applied to off-Base monitoring wells only.
Heads of Environmental Protection Agencies (HEPA), (2020). PFAS National Environmental Management Plan (NEMP).
Denotes first time detection above LOR
Denotes new exceedance of guideline values

Table T3: Surface Water Quality Parameter Results

Location Code	Sample Date	DO mg/L	EC µS/cm	pH	Redox (mV)	Temp (°C)	Turbidity	Water Colour	Odour	Sheen	Sample Location Morphology	Comments
Eastern PFAS Contamination Area												
SW119	18/08/2021	12.31	10548	9.15	46.4	24.3	Medium	Yellow	Slight Organic Odour	No sheen	Concrete drain.	High level of floating organics (algae) in sample
SW121	15/08/2021	0.31	5721	7.81	106.3	24.1	Clear	Very Dark Bluish Grey	No odour	No sheen	Concrete drain.	Sample taken downstream of culvert, upstream on base had no water.
Former Fire Station												
SW109	Location dry during August 2021 sampling event.										Open earthen drain.	
SW110	Location dry during August 2021 sampling event.										Open earthen drain.	
Lavarack Golf Course & Sporting Field												
SW129	Location dry during August 2021 sampling event.										Rock drain.	
SW130	Location dry during August 2021 sampling event.										Rock drain.	
Top, Middle and Lower Dams												
SW139	15/08/2021	4.45	596	6.97	169.6	23.4	Low	Reddish Yellow	Strong sulfurous odour	No sheen	Dam. Water not flowing.	
SW140	15/08/2021	4.08	572	7.07	161.9	22.5	Clear	Yellowish Red	No odour	No sheen	Dam. Water not flowing.	
SW144	15/08/2021	5.58	251.8	6.85	162	23.4	Clear	Yellowish Red	No odour	No sheen	Dam. Water not flowing.	
Remaining On-Base												
SW113	Location dry during August 2021 sampling event.										Creek.	
SW120	Location dry during August 2021 sampling event.										Ephemeral creek.	
Base Boundary												
SW126	Location dry during August 2021 sampling event.										Rock drain.	
SW128	Location dry during August 2021 sampling event.										Rock drain.	
SW132	Location dry during August 2021 sampling event.										Rock drain.	
SW133	Location dry during August 2021 sampling event.										Concrete drain.	
SW134	18/08/2021	1.69	415	7.19	72.2	24.6	Low	Yellow	Slight Organic Odour	Biosheen Appearance	Earthen drain.	Puddle in a rutt, no flow.
SW135	18/08/2021	6.18	623	7.86	64.6	23.7	Clear	Yellowish Red	Slight Organic Odour	Biosheen Appearance	Concrete drain.	Algae in sample.
SW136	Location dry during August 2021 sampling event.										Concrete drain.	
Off-Base												
SW203	19/08/2021	2.48	3554	6.99	-52	21.3	Clear	Yellowish Brown	No odour	Biosheen Appearance	Creek. Not flowing.	
SW205	18/08/2021	2.58	38569	7.4	157.9	21.7	Low	Light Olive Brown	No odour	No sheen	Ross River.	
SW211	19/08/2021	9.13	6585	7.63	121.6	23.5	Medium	Yellowish Brown	No odour	Biosheen Appearance	Rock drain. Slowly flowing.	
SW212	18/08/2021	8.9	7163	8.58	62.12	25.4	Low	Yellow	Weak sulfurous odour	No sheen	Concrete drain. Not flowing.	
SW217	19/08/2021	7.76	507	7.92	7.77	24.7	Clear	Yellowish Brown	No odour	Biosheen Appearance	Creek.	
SW220	16/08/2021	6.89	3620	8.24	116.6	22.6	Low	Yellowish Red	No odour	No sheen	Earthen drain. Not flowing.	Water was present under the road culvert. This was sampled
SW227	18/08/2021	5.19	336.2	8.07	62.5	24.5	Clear	Yellow	No odour	No sheen	Ross River. Immediately downstream of weir. Water not flowing.	
SW232	16/08/2021	6.43	46629	6.42	177.2	23.9	Medium	Light Olive Brown	No odour	No sheen	Creek.	
SW233	16/08/2021	5.61	1721	7.78	140.4	21.9	Low	Light Olive Brown	No odour	No sheen	Creek.	
SW242	15/08/2021	7.03	47034	7.86	178.3	23.9	Clear	Other	No odour	No sheen	Lake. Water not flowing.	
SW243	15/08/2021	7.6	48932	7.67	222.1	24.6	Low	Light Olive Brown	No odour	No sheen	Lake. Water not flowing.	
SW244	18/08/2021	6.86	298.6	7.72	69.3	23.7	Clear	Yellowish Red	No odour	No sheen	Ross River. Downstream of Nathan St bridge. Water not flowing.	
SW245	17/08/2021	4.38	282.9	7.45	86.8	21.3	Clear	Reddish Yellow	No odour	No sheen	Ross River. Immediately upstream of weir. Water not flowing	

Table with columns for chemical names and analytical results. Includes categories like PFAS Full Suite, LOR, and various chemical names such as 4:2 Fluorotelomer sulfonic acid (4:2 FTS).

Table with columns: Location, Sample ID, Sampled Date, and 29 analytical results columns. Rows are categorized by location: Eastern PFAS Contamination Area, Top, Middle and Lower Dams, Base Boundary, and Off-Base.

LOR is limit of reporting
µg/L is micrograms per litre
< denotes concentration is less than
Heads of Environmental Protection Agencies (HEPA). (2020). PFAS National Environmental Management Plan (NEMP).
National Health and Medical Research Council (NHMRC). (2019). Guidance on PFAS in Recreational Water. August 2019 (NHMRC 2019).
*PFAS NEMP 2020 Drinking Water is used for SW245 only. This is the only sample location upstream of Blacks Weir in the Ross River, the backup drinking water source for the city of Townsville.
Denotes first time detection above LOR
Denotes new exceedance of guideline values

Location ID	Date	Sample Description	Odour	Comment
Eastern PFAS Contamination Area				
SD119	18/08/2021	Silty CLAY. Low plasticity, very soft, grey, saturated.	No odour	High organic content (roots and algae).
SD121	16/08/2021	Silty GRAVEL. Medium to coarse, sub-angular gravel, loose, dark grey, saturated.	No odour	High organic content (roots and leaves).
Former Fire Station				
SD109	16/08/2021	Sandy, silty, CLAY. Low plasticity, fine grain sand, brown, moist, with medium to coarse gravels.	No odour	High organic content (roots and leaves).
SD110	16/08/2021	Sandy CLAY. Low plasticity, medium grain sub-angular sand, brown, moist, with medium gravels.	No odour	High organic content (roots and leaves).
Lavarack Golf Course & Sporting Field				
SD129	18/08/2021	Silty GRAVEL. Fine gravel, brown and orange, dry, with some sand.	No odour	High organic content (leaves).
SD130	18/08/2021	SAND. Medium to coarse, sub-rounded to sub-angular, brown, orange and pink, dry, with medium gravels.	No odour	High organic content (leaves).
Top, Middle and Lower Dams				
SD139	16/08/2021	Silty SAND. Medium grain sub-angular, black, saturated.	Sulfurous	High organic content (roots and decaying sticks).
SD140	16/08/2021	Silty SAND. Medium grain sub-angular, saturated, with medium gravels.	No odour	High organic content (roots and decaying sticks).
SD144	16/08/2021	Sandy SILT. Low plasticity, grey brown, saturated, with fine gravels.	No odour	High organic content (roots and leaves).
Remaining On-Base				
SD113	18/08/2021	SAND. Medium to coarse grain, sub-angular, very loose, light brown and orange, dry, with some silt.	No odour	High organic content (sticks and leaves).
SD120	18/08/2021	GRAVEL. Medium to coarse grain, sub-rounded to sub-angular, loose, brown, orange and black, dry, with cobbles and traces of silt.	No odour	High organic content (roots and leaves).
Base Boundary				
SD126	18/08/2021	Silty gravelly SAND. Fine to medium grain, sub-angular, loose, dry.	No odour	High organic content (leaves).
SD128	18/08/2021	Silty gravelly SAND. Fine to medium grain, sub-angular, loose, dry.	No odour	High organic content (leaves).
SD132		Location not sampled. Area was rocky with no sediment or water.		
SD133	16/08/2021	Sandy CLAY. Low plasticity, firm, fine sands, medium to coarse gravels, grey/brown.	No odour	High organic content (grass).
SD134	18/08/2021	Silty CLAY. Low plasticity, grey, soft, saturated.	No odour	Roots and leaves present. Mosquito larvae evident.
SD135	18/08/2021	SAND. Medium to coarse grain, sub-angular, orange, brown and pink, saturated.	No odour	Minor organic content (roots and leaves).
SD136	16/08/2021	Sandy SILT. Low plasticity, firm, grey, dry, with medium sub-angular gravels.	No odour	High organic content (roots and leaves).
Off-Base				
SD203	19/08/2021	Silty SAND. Fine to medium grain, firm, brown, saturated.	No odour	
SD205	19/08/2021	Sandy SILT. Medium plasticity.	No odour	Minor organic content (roots and leaves).
SD211	19/08/2021	Silty SAND. Black, saturated.	No odour	High organic content (roots and leaves). Grass growing in drain.
SD212	19/08/2021	Silty SAND. Sub-angular, mottled brown and black, saturated.	Sulfurous	High organic content (roots and leaves).
SD217	19/08/2021	Silty SAND. Sub-angular, red brown, saturated.	No odour	High organic content (roots and leaves).
SD220	18/08/2021	Silty SAND. Saturdated.	No odour	High organic content (roots and leaves).
SD227	18/08/2021	Silty SAND. Medium to coarse grain, loose, dark grey.	No odour	High organic content (roots and leaves).
SD232	18/08/2021	Silty SAND. Sub-angular, dense, with traces of gravels.	No odour	
SD233	18/08/2021	Silty SAND. Loose, dry.	No odour	High organic content (roots and leaves).
SD242	16/08/2021	Sandy SILT. Low plasticity, very soft, grey, saturated.	No odour	High organic content (roots and leaves).
SD243	16/08/2021	Sandy SILT. Medium plasticity, fine grain, dark grey, saturated.	No odour	High organic content (roots and leaves). 2mm layer of light brown silt on surface
SD244	18/08/2021	Silty, sandy GRAVEL. Fine gravel, medium density, brown, saturated.	No odour	High organic content (roots and leaves).
SD245	18/08/2021	Silty CLAY. Low plasticity, soft, saturated.	No odour	High organic content (roots and leaves).

Table with columns for Location ID, Sample Date, and various PFAS compounds (e.g., PFOA, PFOS, PFNA, etc.) with numerical results and units. The table is organized into sections for different areas like Eastern PFAS Contamination Area, Former B Squadron, Former Fire Station, etc.

Table with columns for Location ID, Sample Date, and various PFAS compounds (e.g., 1-2 FTS, 3 FTS, 10-2 FTS, etc.). Rows include data for locations like SW119, SW121, SW109, SW110, SW129, SW130, SW139, SW140, SW144, SW113, SW120, SW126, SW128, SW132, SW134, SW135, SW136, SW203, SW205, SW211, SW212, SW217, SW220, SW222, SW223, SW224, and SW243, with multiple sampling dates per location.

Table with 30 columns representing PFAS compounds (4:2 FTS, 6:2 FTS, 8:2 FTS, 10:2 FTS, EFOSA, EFOSAA, EFOSE, FOSA, MFOSEA, MFOSSA, MFOSE, PFBS, PFPBS, PFHxS, PFHpS, PFOS, PFDS, PFBA, PFHxA, PFPA, PFHpA, PFOA, PFDA, PFDoDA, PFNA, PFTeDA, PFTrDA, PFUnDA) and 2 summary columns (Sum of PFHxS and PFOA, Sum of PFAS). Rows include units (mg/kg) and LOR values.

Main data table with columns for Location ID, Sample Date, and 30 PFAS compounds. Rows are grouped by location: Eastern PFAS Contamination Area, Former Fire Station, Lavarack Golf Course and Sporting Fields, Top, Middle and Lower Dams, Remaining On-Base, Base Boundary, and Off-Base. Each row contains numerical values for each compound and summary totals.

Appendix C

Analytical Data Validation

DATA VALIDATION REPORT

Project No.:	60612487	Validation by: [REDACTED]	Date: 20/09/2021
Client:	Department of Defence		
Site:	Lavarack Barracks Townsville (0229)		
Matrix type:	Groundwater, surface water, sediment	Data verified by: [REDACTED]	Date: 21/08/2021
No. of primary samples:	40 groundwater, 20 surface water, 30 sediment		
Laboratory:	ALS (Brisbane), NMI (Sydney)	Project Manager: [REDACTED]	
Lab reference:	ET2103890, ET2103889, ET2103890, RN1328463		

Key Issues:	No QA/QC issues were identified in the field or laboratory datasets that could have a material implication on data interpretation and therefore decision-making on the project. The data are considered appropriate for use to meet the project objectives.
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Field QA/QC

Sampling personnel	Sampling was conducted by AECOM personnel from 16 to 20 August 2021.
Sampling Methodology	Samples were collected using appropriate methods as identified within the main body of the report. Hydrasleeves were installed in the well for a minimum of 24 hours prior to collection.
Chain of Custody (COC)	COC documents completed as per AECOM procedures.
Rinsate Blank	Rinsate blank samples were collected at a frequency of one per field staff per day of sampling (11 in total). All concentrations in the rinsate samples were reported below the LOR for all analytes tested (see Table C4).
Trip Blanks	Trip blank samples were submitted to the laboratory at a rate of one per batch of samples delivered to the laboratory (one in total). Concentrations were reported below the LOR for all analytes tested in the trip blank (Table C4). Trip blanks were not submitted for batches where samples on private properties were collected.
Eskies to Laboratory	A total of four eskies of samples in one delivery were submitted to ALS across the sampling event.
Frequency of field QC	Field duplicates (inter-laboratory duplicates) and triplicates (inter-laboratory duplicates) were collected at a target frequency of one in ten primary samples (four duplicates and triplicates for groundwater, two duplicates and triplicates for surface water and three duplicates and triplicates for sediment). The target frequency of 10% for field duplicates and triplicates was achieved for all matrices.
Handling and preservation	Primary, duplicate and triplicate samples were received preserved and chilled at the laboratory. Sample receipt temperature was reported between 1.4°C and 3.8°C. All samples were received at the laboratory in appropriate sample containers with no sample container / preservation non-compliances noted.
Equipment Calibration	Calibration of the water quality meter was conducted each day before sampling, see Appendix F .

Laboratory QA/QC

Tests requested/reported	Samples were analysed and reported as requested on the COC.
Holding time compliance	Samples were extracted and analysed within recommended holding times.
Laboratory Accreditation	The laboratory analysis was conducted by ALS Environmental Pty Ltd (Brisbane) a National Association of Testing Authorities (NATA) accredited laboratory. The triplicate samples were analysed at the National Measurement Institute (Sydney), also a NATA accredited laboratory.
Frequency of laboratory QC	<p>The laboratory reported sufficient frequency of quality control samples to assess whether the results have been reported to an acceptable accuracy and precision, except:</p> <ul style="list-style-type: none">• Laboratory duplicates for PFAS in water (8.86%) were below the expected rate of 10% in ET2103890.• Matrix spikes for PFAS in water (2.53%) were below the expected rate of 5% in ET2103890.
Method Blank	No method blank value outliers were reported.
Laboratory duplicate RPDs	Laboratory duplicate Relative Percentage Differences (RPD) were within control limits for all samples.
Laboratory control spike (LCS) recovery	All LCS recoveries were reported within acceptable limits.
Matrix spike recovery	<p>All matrix spike (MS) recoveries were within control limits, except:</p> <ul style="list-style-type: none">• Perfluorohexane sulfonic acid (PFHxS), perfluorooctane sulfonic acid (PFOS) was not determined in soil in batch ET2103890 due to background level being greater than or equal to four times the spike level.• Perfluorohexane sulfonic acid (PFHxS) was not determined in water in batch ET2103890 due to background level being greater than or equal to four times the spike level.• Perfluoropentanoic acid (PFPeA) was not determined in water in batch ET2103889 or ET2103923 due to background level being greater than or equal to four times the spike level.
Surrogate spike recovery	No surrogate recovery outliers were reported.

QA/QC Data Evaluation

Comparison of Field Observations and Laboratory Results	No anomalous results between field observations and analysis results were noted.
Data transcription	A random 10% check of the laboratory results identified no anomalies within the electronic data, the laboratory reports, and tables generated by AECOM.
Limits of reporting	<p>Limits of Reporting (LORs) were sufficiently low to enable assessment against adopted screening levels.</p> <p>LOR values were adjusted due to sample matrix interference or high analyte concentrations for the following samples:</p> <ul style="list-style-type: none">• 0229_MW018_210817, 0229_MW065_210818, 0229_MW128_210818, 0229_MW105_210818, 0229_MW217_210818, 0229_MW235S_210818, 0229_MW236S_210819, 0229_MW074_210819, 0229_MW232_210820, 0229_MW072_210820, 0229_SD139_210816 in ET2103890.

Field duplicate RPDs

RPDs for groundwater, surface water, and sediment are reported in **Tables C1, C2, and C3** respectively. Field duplicate RPDs were reported within control limits exception of the following (the sample with the higher concentration is in bold):

- PFOS in **0229_MW018_210818** and 0229_QC104_210818.
- PFOS in 0229_SD140_210816 and **0229_QC101_210816**.

Duplicate concentrations were within the same order of magnitude compared to the concentrations in the primary sample and this is not considered to impact interpretation of results.

Field triplicate RPDs

Field triplicate RPDs were reported within control limits for all sample sets with the exception of the following (the sample with the higher concentration is in bold):

- PFBS, PFHxA, PFPeS, PFOS, PFOA and PFHxS in **0229_MW018_210818** and 0229_QC104_210818.
- PFHpS and PFPeS in **0229_MW105_210818** and 0229_QC205_210818.
- PFPeS, PFOS and PFOA in **0229_MW131_210819** and 0229_QC208_210819.
- PFHxS in **0229_SW140_210816** and 0229_QC200_210816.
- PFOS in **0229_SD140_210816** and 0229_QC201_210816.
- PFOS in **0229_SD120_210818** and 0229_QC207_210818

Where RPDs exceeded control limits the higher concentration was reported in the primary sample, therefore this would not lead to under reporting detections in primary samples. Triplicate concentrations, with the exception of 0229_QC200_210816, were within the same order of magnitude compared to the concentrations in the primary sample. The variability between the primary and triplicate results is inferred to be the result of slight differences in analytical methods employed by the two laboratories. This is demonstrated through the laboratory duplicate results all being within acceptable limits.

Table C1 - Groundwater Duplicate and Triplicate Results

Lab Report Number	ET2103890	ET2103890	RPD	RN1328463	RPD	ET2103890	ET2103890	RPD	RN1328463	RPD
Field ID	0229_MW018_210818	0229_QC104_210818		0229_QC204_210818		0229_MW105_210818	0229_QC105_210818		0229_QC205_210818	
Sampled Date/Time	18/08/2021 10:08	18/08/2021 10:08		18/08/2021 10:08		18/08/2021 11:56	18/08/2021 11:56		18/08/2021 11:56	

ChemName	Units	EQL										
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	µg/L	0.05 : 0.01 (Interlab)	<0.05	<0.05	NC	<0.01	NC	<0.05	<0.05	NC	<0.01	NC
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	µg/L	0.05 : 0.01 (Interlab)	<0.05	<0.05	NC	<0.01	NC	<0.05	<0.05	NC	<0.01	NC
6:2 Fluorotelomer Sulfonate (6:2 FTS)	µg/L	0.05 : 0.01 (Interlab)	<0.05	<0.05	NC	<0.01	NC	0.24	0.2	18	0.2	18
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	µg/L	0.05 : 0.01 (Interlab)	<0.05	<0.05	NC	<0.01	NC	<0.05	<0.05	NC	0.039	NC
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	µg/L	0.05 : 0.02 (Interlab)	<0.05	<0.05	NC	<0.02	NC	<0.09	<0.09	NC	<0.02	NC
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	µg/L	0.02 : 0.01 (Interlab)	<0.02	<0.02	NC	<0.01	NC	<0.04	<0.04	NC	<0.01	NC
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	µg/L	0.05	<0.05	<0.05	NC	<0.05	NC	<0.09	<0.09	NC	<0.05	NC
N-Methyl perfluorooctane sulfonamide (MeFOSA)	µg/L	0.05 : 0.02 (Interlab)	<0.05	<0.05	NC	<0.02	NC	<0.09	<0.09	NC	<0.02	NC
N-Methyl perfluorooctane sulfonamidoacetic acid (MFOSAA)	µg/L	0.02 : 0.01 (Interlab)	<0.02	<0.02	NC	<0.01	NC	<0.04	<0.04	NC	<0.01	NC
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	µg/L	0.05	<0.05	<0.05	NC	<0.05	NC	<0.09	<0.09	NC	<0.05	NC
Perfluorobutane sulfonic acid (PFBS)	µg/L	0.02 : 0.01 (Interlab)	0.44	0.38	15	0.31	35	4.13	4.22	2	3.4	19
Perfluorobutanoic acid (PFBA)	µg/L	0.1 : 0.05 (Interlab)	<0.1	<0.1	NC	0.1	NC	0.7	0.7	0	0.72	3
Perfluorodecanesulfonic acid (PFDS)	µg/L	0.02 : 0.01 (Interlab)	<0.02	<0.02	NC	<0.01	NC	<0.04	<0.04	NC	<0.01	NC
Perfluorodecanoic acid (PFDA)	µg/L	0.02 : 0.01 (Interlab)	<0.02	<0.02	NC	<0.01	NC	<0.04	<0.04	NC	<0.01	NC
Perfluorododecanoic acid (PFDoDA)	µg/L	0.02 : 0.01 (Interlab)	<0.02	<0.02	NC	<0.01	NC	<0.04	<0.04	NC	<0.01	NC
Perfluoroheptane sulfonic acid (PFHpS)	µg/L	0.02 : 0.01 (Interlab)	0.16	0.15	6	0.097	49	1.5	1.62	8	0.84	56
Perfluoroheptanoic acid (PFHpA)	µg/L	0.02 : 0.01 (Interlab)	0.11	0.09	20	0.069	46	0.96	0.92	4	0.82	16
Perfluorohexanoic acid (PFHxA)	µg/L	0.02 : 0.01 (Interlab)	0.9	0.79	13	0.56	47	9.94	10.3	4	8.5	16
Perfluorononanoic acid (PFNA)	µg/L	0.02 : 0.01 (Interlab)	<0.02	<0.02	NC	<0.01	NC	0.14	0.12	15	0.12	15
Perfluorooctane sulfonamide (FOSA)	µg/L	0.02 : 0.01 (Interlab)	<0.02	<0.02	NC	<0.01	NC	<0.04	<0.04	NC	<0.01	NC
Perfluoropentane sulfonic acid (PFPeS)	µg/L	0.02 : 0.01 (Interlab)	0.46	0.42	9	0.27	52	4.84	4.84	0	3.4	35
Perfluoropentanoic acid (PFPeA)	µg/L	0.02	0.15	0.14	7	0.097	43	1.62	1.59	2	1.4	15
Perfluorotetradecanoic acid (PFTeDA)	µg/L	0.05 : 0.02 (Interlab)	<0.05	<0.05	NC	<0.02	NC	<0.09	<0.09	NC	<0.02	NC
Perfluorotridecanoic acid (PFTrDA)	µg/L	0.02	<0.02	<0.02	NC	<0.02	NC	<0.04	<0.04	NC	<0.02	NC
Perfluoroundecanoic acid (PFUnDA)	µg/L	0.02 : 0.01 (Interlab)	<0.02	<0.02	NC	<0.01	NC	<0.04	<0.04	NC	0.015	NC
Perfluorooctane sulfonic acid (PFOS)	µg/L	0.01 : 0.02 (Interlab)	4.69	3.4	32	3.1	41	27.3	26.4	3	21	26
Perfluorooctanoic Acid (PFOA)	µg/L	0.01	0.19	0.16	17	0.11	53	1.62	1.65	2	1.2	30
Perfluorohexane sulfonic acid (PFHxS)	µg/L	0.02 : 0.01 (Interlab)	2.66	2.31	14	1.8	39	33.4	35.4	6	30	11

*RPDs have only been considered where a concentration is greater than 1 times the EQL.

**High RPDs are in bold (Acceptable RPDs for each EQL multiplier range are: 100 (1-10 x EQL); 50 (10-20 x EQL); 30 (> 20 x EQL))

Table C1 - Groundwater Duplicate and Triplicate Results

Lab Report Number	ET2103890	ET2103890	RPD	RN1328463	RPD	ET2103890	ET2103890	RPD	RN1328463	RPD
Field ID	0229_MW101_210818	0229_QC106_210818		0229_QC206_210818		0229_MW131_210819	0229_QC108_210819		0229_QC208_210819	
Sampled Date/Time	18/08/2021 12:24	18/08/2021 12:24		18/08/2021 12:24		19/08/2021 9:30	19/08/2021 9:30		19/08/2021 9:30	

ChemName	Units	EQL										
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	µg/L	0.05 : 0.01 (Interlab)	<0.05	<0.05	NC	<0.01	NC	<0.05	<0.05	NC	<0.01	NC
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	µg/L	0.05 : 0.01 (Interlab)	<0.05	<0.05	NC	<0.01	NC	<0.05	<0.05	NC	<0.01	NC
6:2 Fluorotelomer Sulfonate (6:2 FTS)	µg/L	0.05 : 0.01 (Interlab)	<0.05	<0.05	NC	<0.01	NC	0.05	0.05	0	0.047	6
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	µg/L	0.05 : 0.01 (Interlab)	<0.05	<0.05	NC	<0.01	NC	<0.05	<0.05	NC	<0.01	NC
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	µg/L	0.05 : 0.02 (Interlab)	<0.05	<0.05	NC	<0.02	NC	<0.05	<0.05	NC	<0.02	NC
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	µg/L	0.02 : 0.01 (Interlab)	<0.02	<0.02	NC	<0.01	NC	<0.02	<0.02	NC	<0.01	NC
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	µg/L	0.05	<0.05	<0.05	NC	<0.05	NC	<0.05	<0.05	NC	<0.05	NC
N-Methyl perfluorooctane sulfonamide (MeFOSA)	µg/L	0.05 : 0.02 (Interlab)	<0.05	<0.05	NC	<0.02	NC	<0.05	<0.05	NC	<0.02	NC
N-Methyl perfluorooctane sulfonamidoacetic acid (MFOSAA)	µg/L	0.02 : 0.01 (Interlab)	<0.02	<0.02	NC	<0.01	NC	<0.02	<0.02	NC	<0.01	NC
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	µg/L	0.05	<0.05	<0.05	NC	<0.05	NC	<0.05	<0.05	NC	<0.05	NC
Perfluorobutane sulfonic acid (PFBS)	µg/L	0.02 : 0.01 (Interlab)	0.26	0.31	18	0.19	31	0.54	0.54	0	0.47	14
Perfluorobutanoic acid (PFBA)	µg/L	0.1 : 0.05 (Interlab)	<0.1	<0.1	NC	<0.05	NC	<0.1	0.1	NC	0.13	NC
Perfluorodecanesulfonic acid (PFDS)	µg/L	0.02 : 0.01 (Interlab)	<0.02	<0.02	NC	<0.01	NC	<0.02	<0.02	NC	<0.01	NC
Perfluorodecanoic acid (PFDA)	µg/L	0.02 : 0.01 (Interlab)	<0.02	<0.02	NC	<0.01	NC	<0.02	<0.02	NC	<0.01	NC
Perfluorododecanoic acid (PFDoDA)	µg/L	0.02 : 0.01 (Interlab)	<0.02	<0.02	NC	<0.01	NC	<0.02	<0.02	NC	<0.01	NC
Perfluoroheptane sulfonic acid (PFHpS)	µg/L	0.02 : 0.01 (Interlab)	0.03	0.02	40	0.013	79	0.14	0.14	0	0.1	33
Perfluoroheptanoic acid (PFHpA)	µg/L	0.02 : 0.01 (Interlab)	<0.02	<0.02	NC	<0.01	NC	0.18	0.18	0	0.13	32
Perfluorohexanoic acid (PFHxA)	µg/L	0.02 : 0.01 (Interlab)	0.09	0.09	0	0.061	38	1.09	1.11	2	0.9	19
Perfluorononanoic acid (PFNA)	µg/L	0.02 : 0.01 (Interlab)	<0.02	<0.02	NC	<0.01	NC	<0.02	<0.02	NC	<0.01	NC
Perfluorooctane sulfonamide (FOSA)	µg/L	0.02 : 0.01 (Interlab)	<0.02	<0.02	NC	<0.01	NC	<0.02	<0.02	NC	<0.01	NC
Perfluoropentane sulfonic acid (PFPeS)	µg/L	0.02 : 0.01 (Interlab)	0.1	0.1	0	0.062	47	0.56	0.48	15	0.39	36
Perfluoropentanoic acid (PFPeA)	µg/L	0.02	<0.02	<0.02	NC	<0.02	NC	0.22	0.23	4	0.17	26
Perfluorotetradecanoic acid (PFTeDA)	µg/L	0.05 : 0.02 (Interlab)	<0.05	<0.05	NC	<0.02	NC	<0.05	<0.05	NC	<0.02	NC
Perfluorotridecanoic acid (PFTrDA)	µg/L	0.02	<0.02	<0.02	NC	<0.02	NC	<0.02	<0.02	NC	<0.02	NC
Perfluoroundecanoic acid (PFUnDA)	µg/L	0.02 : 0.01 (Interlab)	<0.02	<0.02	NC	<0.01	NC	<0.02	<0.02	NC	<0.01	NC
Perfluorooctane sulfonic acid (PFOS)	µg/L	0.01 : 0.02 (Interlab)	0.67	0.78	15	0.5	29	5.32	3.94	30	3.8	33
Perfluorooctanoic Acid (PFOA)	µg/L	0.01	0.03	0.03	0	0.016	61	0.27	0.27	0	0.18	40
Perfluorohexane sulfonic acid (PFHxS)	µg/L	0.02 : 0.01 (Interlab)	0.6	0.58	3	0.5	18	2.8	2.59	8	2.1	29

*RPDs have only been considered where a concentration is greater than 1 times the EQL.

**High RPDs are in bold (Acceptable RPDs for each EQL multiplier range are: 100 (1-10 x EQL); 50 (10-20 x EQL); 30 (> 20 x EQL))

Table C2 - Surface Water Duplicate and Triplicate Results

Lab Report Number	ET2103890	ET2103890	RPD	RN1328463	RPD	ET2103890	ET2103890	RPD	RN1328463	RPD
Field ID	0229_SW140_210816	0229_QC100_210816		0229_QC200_210816		0229_SW244_210818	0229_QC103_210818		0229_QC203_210818	
Sampled Date/Time	16/08/2021 13:08	16/08/2021 13:08		16/08/2021 13:08		18/08/2021 10:12	18/08/2021 10:12		18/08/2021 10:12	

ChemName	Units	EQL										
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	µg/L	0.05 : 0.01 (Interlab)	<0.05	<0.05	NC	<0.01	NC	<0.05	<0.05	NC	<0.01	NC
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	µg/L	0.05 : 0.01 (Interlab)	<0.05	<0.05	NC	<0.01	NC	<0.05	<0.05	NC	<0.01	NC
6:2 Fluorotelomer Sulfonate (6:2 Fts)	µg/L	0.05 : 0.01 (Interlab)	<0.05	<0.05	NC	<0.01	NC	<0.05	<0.05	NC	<0.01	NC
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	µg/L	0.05 : 0.01 (Interlab)	<0.05	<0.05	NC	<0.01	NC	<0.05	<0.05	NC	<0.01	NC
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	µg/L	0.05 : 0.02 (Interlab)	<0.05	<0.05	NC	<0.02	NC	<0.05	<0.05	NC	<0.02	NC
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	µg/L	0.02 : 0.01 (Interlab)	<0.02	<0.02	NC	<0.01	NC	<0.02	<0.02	NC	<0.01	NC
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	µg/L	0.05	<0.05	<0.05	NC	<0.05	NC	<0.05	<0.05	NC	<0.05	NC
N-Methyl perfluorooctane sulfonamide (MeFOSA)	µg/L	0.05 : 0.02 (Interlab)	<0.05	<0.05	NC	<0.02	NC	<0.05	<0.05	NC	<0.02	NC
N-Methyl perfluorooctane sulfonamidoacetic acid (MFOSAA)	µg/L	0.02 : 0.01 (Interlab)	<0.02	<0.02	NC	<0.01	NC	<0.02	<0.02	NC	<0.01	NC
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	µg/L	0.05	<0.05	<0.05	NC	<0.05	NC	<0.05	<0.05	NC	<0.05	NC
Perfluorobutane sulfonic acid (PFBS)	µg/L	0.02 : 0.01 (Interlab)	0.17	0.18	6	0.15	13	<0.02	<0.02	NC	<0.01	NC
Perfluorobutanoic acid (PFBA)	µg/L	0.1 : 0.05 (Interlab)	<0.1	<0.1	NC	0.07	NC	<0.1	<0.1	NC	<0.05	NC
Perfluorodecanesulfonic acid (PFDS)	µg/L	0.02 : 0.01 (Interlab)	<0.02	<0.02	NC	<0.01	NC	<0.02	<0.02	NC	<0.01	NC
Perfluorodecanoic acid (PFDA)	µg/L	0.02 : 0.01 (Interlab)	<0.02	<0.02	NC	<0.01	NC	<0.02	<0.02	NC	<0.01	NC
Perfluorododecanoic acid (PFDoDA)	µg/L	0.02 : 0.01 (Interlab)	<0.02	<0.02	NC	<0.01	NC	<0.02	<0.02	NC	<0.01	NC
Perfluoroheptane sulfonic acid (PFHpS)	µg/L	0.02 : 0.01 (Interlab)	0.06	0.07	15	0.042	35	<0.02	<0.02	NC	<0.01	NC
Perfluoroheptanoic acid (PFHpA)	µg/L	0.02 : 0.01 (Interlab)	0.04	0.04	0	0.029	32	<0.02	<0.02	NC	<0.01	NC
Perfluorohexanoic acid (PFHxA)	µg/L	0.02 : 0.01 (Interlab)	0.34	0.35	3	0.3	13	<0.02	<0.02	NC	<0.01	NC
Perfluorononanoic acid (PFNA)	µg/L	0.02 : 0.01 (Interlab)	<0.02	<0.02	NC	<0.01	NC	<0.02	<0.02	NC	<0.01	NC
Perfluorooctane sulfonamide (FOSA)	µg/L	0.02 : 0.01 (Interlab)	<0.02	<0.02	NC	<0.01	NC	<0.02	<0.02	NC	<0.01	NC
Perfluoropentane sulfonic acid (PFPeS)	µg/L	0.02 : 0.01 (Interlab)	0.16	0.16	0	0.11	37	<0.02	<0.02	NC	<0.01	NC
Perfluoropentanoic acid (PFPeA)	µg/L	0.02	0.06	0.07	15	0.056	7	<0.02	<0.02	NC	<0.02	NC
Perfluorotetradecanoic acid (PFTeDA)	µg/L	0.05 : 0.02 (Interlab)	<0.05	<0.05	NC	<0.02	NC	<0.05	<0.05	NC	<0.02	NC
Perfluorotridecanoic acid (PFTrDA)	µg/L	0.02	<0.02	<0.02	NC	<0.02	NC	<0.02	<0.02	NC	<0.02	NC
Perfluoroundecanoic acid (PFUnDA)	µg/L	0.02 : 0.01 (Interlab)	<0.02	<0.02	NC	<0.01	NC	<0.02	<0.02	NC	<0.01	NC
Perfluorooctane sulfonic acid (PFOS)	µg/L	0.01 : 0.02 (Interlab)	1.57	1.62	3	1.3	19	<0.01	<0.01	NC	<0.02	NC
Perfluorooctanoic Acid (PFOA)	µg/L	0.01	0.09	0.1	11	0.063	35	<0.01	<0.01	NC	<0.01	NC
Perfluorohexane sulfonic acid (PFHxS)	µg/L	0.02 : 0.01 (Interlab)	1.12	1.14	2	0.82	31	<0.02	<0.02	NC	<0.01	NC

*RPDs have only been considered where a concentration is greater than 1 times the EQL.
**High RPDs are in bold (Acceptable RPDs for each EQL multiplier range are: 100 (1-10 x EQL); 50 (10-20 x EQL); 30 (> 20 x EQL))

Lab Report Number	ET2103890	ET2103890	RPD	RN1328463	RPD	ET2103890	ET2103890	RPD	RN1328463	RPD	ET2103890	ET2103890	RPD	RN1328463	RPD		
Field ID	0229_SD140_210816	0229_QC101_210816		0229_QC201_210816		0229_SD244_210818	0229_QC102_210818		0229_QC202_210818		0229_SD120_210818	0229_QC107_210818		0229_QC207_210818			
Sampled Date/Time	16/08/2021 13:07	16/08/2021 13:07		16/08/2021 13:07		18/08/2021 10:00	18/08/2021 10:00		18/08/2021 10:00		18/08/2021 14:47	18/08/2021 14:47		18/08/2021 14:47			
ChemName	Units	EQL															
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	mg/kg	0.0005 : 0.001 (Interlab)	<0.0005	<0.0005	NC	<0.001	NC	<0.0005	<0.0005	NC	<0.001	NC	<0.0005	<0.0005	NC	<0.001	NC
6:2 Fluorotelomer Sulfonate (6:2 FTS)	mg/kg	0.0005 : 0.001 (Interlab)	<0.0005	<0.0005	NC	<0.001	NC	<0.0005	<0.0005	NC	<0.001	NC	<0.0005	<0.0005	NC	<0.001	NC
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	mg/kg	0.0005 : 0.001 (Interlab)	<0.0005	<0.0005	NC	<0.001	NC	<0.0005	<0.0005	NC	<0.001	NC	<0.0005	<0.0005	NC	<0.001	NC
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	mg/kg	0.0005 : 0.002 (Interlab)	<0.0005	<0.0005	NC	<0.002	NC	<0.0005	<0.0005	NC	<0.002	NC	<0.0005	<0.0005	NC	<0.002	NC
N-Ethyl perfluorooctane sulfonamide (EtFOA)	mg/kg	0.0005 : 0.002 (Interlab)	<0.0005	<0.0005	NC	<0.002	NC	<0.0005	<0.0005	NC	<0.002	NC	<0.0005	<0.0005	NC	<0.002	NC
N-Ethyl perfluorooctane sulfonamideacetic acid (EtFOASA)	mg/kg	0.0002 : 0.002 (Interlab)	<0.0002	<0.0002	NC	<0.002	NC	<0.0002	<0.0002	NC	<0.002	NC	<0.0002	<0.0002	NC	<0.002	NC
N-Ethyl perfluorooctane sulfonamideethanol (EtFOSE)	mg/kg	0.0005 : 0.005 (Interlab)	<0.0005	<0.0005	NC	<0.005	NC	<0.0005	<0.0005	NC	<0.005	NC	<0.0005	<0.0005	NC	<0.005	NC
N-Methyl perfluorooctane sulfonamide (MeFOA)	mg/kg	0.0005 : 0.002 (Interlab)	<0.0005	<0.0005	NC	<0.002	NC	<0.0005	<0.0005	NC	<0.002	NC	<0.0005	<0.0005	NC	<0.002	NC
N-Methyl perfluorooctane sulfonamideacetic acid (MFOASA)	mg/kg	0.0002 : 0.002 (Interlab)	<0.0002	<0.0002	NC	<0.002	NC	<0.0002	<0.0002	NC	<0.002	NC	<0.0002	<0.0002	NC	<0.002	NC
N-Methyl perfluorooctane sulfonamideethanol (MeFOSE)	mg/kg	0.0005 : 0.005 (Interlab)	<0.0005	<0.0005	NC	<0.005	NC	<0.0005	<0.0005	NC	<0.005	NC	<0.0005	<0.0005	NC	<0.005	NC
Perfluorobutane sulfonic acid (PFBS)	mg/kg	0.0002 : 0.001 (Interlab)	0.0002	0.0002	0	<0.001	NC	<0.0002	<0.0002	NC	<0.001	NC	<0.0002	<0.0002	NC	<0.001	NC
Perfluorobutanoic acid (PFBA)	mg/kg	0.001	<0.001	<0.001	NC	<0.002	NC	<0.001	<0.001	NC	<0.002	NC	<0.001	<0.001	NC	<0.002	NC
Perfluorodecane sulfonic acid (PFDS)	mg/kg	0.0002	0.0004	0.0004	0	<0.001	NC	<0.0002	<0.0002	NC	<0.001	NC	<0.0002	<0.0002	NC	<0.001	NC
Perfluorodecanoic acid (PFDA)	mg/kg	0.0002 : 0.001 (Interlab)	<0.0002	<0.0002	NC	<0.001	NC	<0.0002	<0.0002	NC	<0.001	NC	<0.0002	<0.0002	NC	<0.001	NC
Perfluorododecanoic acid (PFDoDA)	mg/kg	0.0002 : 0.002 (Interlab)	<0.0002	<0.0002	NC	<0.002	NC	<0.0002	<0.0002	NC	<0.002	NC	<0.0002	<0.0002	NC	<0.002	NC
Perfluoroheptane sulfonic acid (PFHsS)	mg/kg	0.0002 : 0.001 (Interlab)	0.0004	0.0006	40	<0.001	NC	<0.0002	<0.0002	NC	<0.001	NC	<0.0002	<0.0002	NC	<0.001	NC
Perfluoroheptanoic acid (PFHsA)	mg/kg	0.0002 : 0.001 (Interlab)	<0.0002	<0.0002	NC	<0.001	NC	<0.0002	<0.0002	NC	<0.001	NC	<0.0002	<0.0002	NC	<0.001	NC
Perfluorohexanoic acid (PFHxA)	mg/kg	0.0002 : 0.001 (Interlab)	0.0004	0.0004	0	<0.001	NC	<0.0002	<0.0002	NC	<0.001	NC	<0.0002	<0.0002	NC	<0.001	NC
Perfluorononanoic acid (PFNA)	mg/kg	0.0002 : 0.001 (Interlab)	<0.0002	<0.0002	NC	<0.001	NC	<0.0002	<0.0002	NC	<0.001	NC	<0.0002	<0.0002	NC	<0.001	NC
Perfluorooctane sulfonamide (FOA)	mg/kg	0.0002 : 0.001 (Interlab)	<0.0002	<0.0002	NC	<0.001	NC	<0.0002	<0.0002	NC	<0.001	NC	<0.0002	<0.0002	NC	<0.001	NC
Perfluoropentane sulfonic acid (PFPeS)	mg/kg	0.0002 : 0.001 (Interlab)	0.0002	0.0003	40	<0.001	NC	<0.0002	<0.0002	NC	<0.001	NC	<0.0002	<0.0002	NC	<0.001	NC
Perfluoropentanoic acid (PFPeA)	mg/kg	0.0002 : 0.002 (Interlab)	<0.0002	<0.0002	NC	<0.002	NC	<0.0002	<0.0002	NC	<0.002	NC	<0.0002	<0.0002	NC	<0.002	NC
Perfluorotetradecanoic acid (PFTeDA)	mg/kg	0.0005 : 0.002 (Interlab)	<0.0005	<0.0005	NC	<0.002	NC	<0.0005	<0.0005	NC	<0.002	NC	<0.0005	<0.0005	NC	<0.002	NC
Perfluorotridecanoic acid (PFTriDA)	mg/kg	0.0002 : 0.002 (Interlab)	<0.0002	<0.0002	NC	<0.002	NC	<0.0002	<0.0002	NC	<0.002	NC	<0.0002	<0.0002	NC	<0.002	NC
Perfluoroundecanoic acid (PFUnDA)	mg/kg	0.0002 : 0.002 (Interlab)	<0.0002	<0.0002	NC	<0.002	NC	<0.0002	<0.0002	NC	<0.002	NC	<0.0002	<0.0002	NC	<0.002	NC
Perfluorooctane sulfonic acid (PFOS)	mg/kg	0.0002 : 0.002 (Interlab)	0.0222	0.033	39	0.015	39	<0.0002	<0.0002	NC	<0.002	NC	0.0034	0.0035	3	0.006	55
Perfluorooctanoic Acid (PFOA)	mg/kg	0.0002 : 0.001 (Interlab)	0.0002	0.0002	0	<0.001	NC	<0.0002	<0.0002	NC	<0.001	NC	<0.0002	<0.0002	NC	<0.001	NC
Perfluorohexane sulfonic acid (PFHxS)	mg/kg	0.0002 : 0.001 (Interlab)	0.0027	0.0036	29	0.0019	35	<0.0002	<0.0002	NC	<0.001	NC	0.0003	0.0003	0	<0.001	NC

*RPDs have only been considered where a concentration is greater than 1 times the EQL.
**High RPDs are in bold (Acceptable RPDs for each EQL multiplier range are: 100 (1-10 x EQL); 50 (10-20 x EQL); 30 (> 20 x EQL))

Table C4 - Rinsate and Trip Blank Results

Lab Report Number	ET2103890	ET2103890	ET2103890	ET2103890	ET2103890
Field ID	0229_QC309_210819	0229_QC303_210818	0229_QC304_210818	0229_QC310_210820	0229_QC500_210816
Sampled Date/Time	19/08/2021 11:25	18/08/2021 12:30	18/08/2021 12:30	20/08/2021 11:47	16/08/2021 11:12
Sample Type	Rinsate	Rinsate	Rinsate	Rinsate	Trip Blank

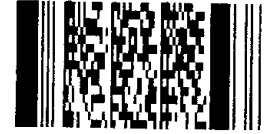
ChemName	Units	EQL					
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	µg/L	0.01	<0.05	<0.05	<0.05	<0.05	<0.05
6:2 Fluorotelomer Sulfonate (6:2 FTS)	µg/L	0.01	<0.05	<0.05	<0.05	<0.05	<0.05
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	µg/L	0.01	<0.05	<0.05	<0.05	<0.05	<0.05
10:2 Fluorotelomer sulfonic acid (10:2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

Appendix D

Chain of Custody Records



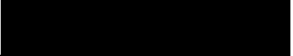
Environmental Division
Townsville
Work Order Reference
ET2103890



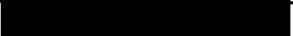
Telephone : + 61 7 4773 0000

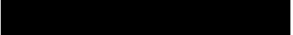
Custody Document for Submissions via ALS Compass App

Project: QLD_0229_PFRAS OMP_20 Client: AECOM

Project Manager: 

ALS Compass COC Reference: 26431 # Samples: 106

Phone: ()

Sampler: 

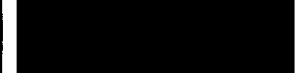
Phone: ()

Turnaround Requirements: Standard Urgent

Special Instructions:

Custody:

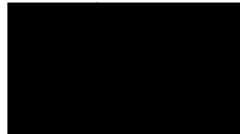
Relinquished by:



Date / Time:

20/8/21
12:10

Received by:

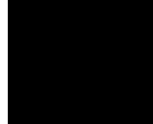


ALSTSV

Date / Time:

20/8/21 12:10

Relinquished by:



Date / Time:

22/8/21 1600

Received by:



Date / Time:

24-08-21 08:25

RELINQUISHED BY:
 DATE TIME:

RECEIVED BY:
 DATE TIME:

RELINQUISHED BY:
 DATE TIME:

RECEIVED BY:
 DATE TIME:

CLIENT: AECOMAU - AECOM Australia Pty Ltd
 PROJECT: QLD_0229_PFSOMP_20
 SITE: QLD_0229
 ORDER NO:
 PROJECT MANAGER:
 PRIMARY SAMPLER:
 EMAIL REPORTS TO:
 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:

CONTACT PH: SAMPLER MOBILE:
 QUOTE NO: TV/007/21 - Compass / ET2021AECOMAU000
 1

SAMPLE DETAILS							ANALYSIS REQUIRED				
SAMPLE	NAME	DESCRIPTION	DATE / TIME	MATRIX	TOTAL BOTTLES	ON HOLD	Analysis NOT REQUIRED	Sediments SEDIMENT	Waters WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
001	0229_QC500_210816		16/08/2021 11:12 AM	Water	ALS: 2 Non ALS: 0	No			Partial 1/4		
002	0229_SW144_210816		16/08/2021 11:27 AM	Water	ALS: 2 Non ALS: 0	No			Partial 1/4		
003	0229_SD144_210816		16/08/2021 11:27 AM	Soil	ALS: 1 Non ALS: 0	No		Partial 1/4			
004	0229_SD110_210816		16/08/2021 11:49 AM	Soil	ALS: 1 Non ALS: 0	No		Partial 1/4			
005	0229_SD109_210816		16/08/2021 11:58 AM	Soil	ALS: 1 Non ALS: 0	No		Partial 1/4			
006	0229_SW139_210816		16/08/2021 12:34 PM	Water	ALS: 2 Non ALS: 0	No			Partial 1/4		
007	0229_SD139_210816		16/08/2021 12:35 PM	Soil	ALS: 1 Non ALS: 0	No		Partial 1/4			
008	0229_QC101_210816		16/08/2021 01:06 PM	Soil	ALS: 1 Non ALS: 0	No		Partial 1/4			
009	0229_SD140_210816		16/08/2021 01:07 PM	Soil	ALS: 1 Non ALS: 0	No		Partial 1/4			

RELINQUISHED BY:
 DATE TIME:

RECEIVED BY:
 DATE TIME:

RELINQUISHED BY:
 DATE TIME:

RECEIVED BY:
 DATE TIME:

CLIENT: AECOMAU - AECOM Australia Pty Ltd

PROJECT: QLD_0229_PFSOMP_20

SITE: QLD_0229

ORDER NO:

PROJECT MANAGER:

PRIMARY SAMPLER:

EMAIL REPORTS TO:

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:

CONTACT PH: SAMPLER MOBILE:
 QUOTE NO: TV/007/21 - Compass / ET2021AECOMAU000
 1

SAMPLE DETAILS

ANALYSIS REQUIRED

SAMPLE	NAME	DESCRIPTION	DATE / TIME	MATRIX	TOTAL BOTTLES	ON HOLD	Analysis NOT REQUIRED	Sediments SEDIMENT	Waters WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
010	0229_QC100_210816		16/08/2021 01:08 PM	Water	ALS: 2 Non ALS: 0	No			Partial 1/4		
011	0229_SW140_210816		16/08/2021 01:08 PM	Water	ALS: 2 Non ALS: 0	No			Partial 1/4		
012	0229_SW243_210816		16/08/2021 02:14 PM	Water	ALS: 4 Non ALS: 0	No			Partial 1/4		Extra vol for lab QC
013	0229_SD243_210816		16/08/2021 02:15 PM	Soil	ALS: 1 Non ALS: 0	No		Partial 1/4			
014	0229_SD242_210816		16/08/2021 02:43 PM	Soil	ALS: 1 Non ALS: 0	No		Partial 1/4			
015	0229_SW242_210816		16/08/2021 02:44 PM	Water	ALS: 2 Non ALS: 0	No			Partial 1/4		
016	0229_SD136_210816		16/08/2021 03:17 PM	Soil	ALS: 1 Non ALS: 0	No		Partial 1/4			
017	0229_SW121_210816		16/08/2021 03:35 PM	Water	ALS: 2 Non ALS: 0	No			Partial 1/4		
018	0229_SD121_210816		16/08/2021 03:36 PM	Soil	ALS: 1 Non ALS: 0	No		Partial 1/4			

RELINQUISHED BY:
 DATE TIME:

RECEIVED BY:
 DATE TIME:

RELINQUISHED BY:
 DATE TIME:

RECEIVED BY:
 DATE TIME:

CLIENT: AECOMAU - AECOM Australia Pty Ltd

PROJECT: QLD_0229_PFASOMP_20

SITE: QLD_0229

ORDER NO:

PROJECT MANAGER:

PRIMARY SAMPLER:

EMAIL REPORTS TO:

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:

CONTACT PH: SAMPLER MOBILE:
 QUOTE NO: TV/007/21 - Compass / ET2021AECOMAU000
 1

SAMPLE DETAILS

ANALYSIS REQUIRED

SAMPLE	NAME	DESCRIPTION	DATE / TIME	MATRIX	TOTAL BOTTLES	ON HOLD	ANALYSIS REQUIRED				
							Analysis NOT REQUIRED	Sediments SEDIMENT	Waters WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
019	0229_SD133_210816		16/08/2021 04:00 PM	Soil	ALS: 1 Non ALS: 0	No		Partial 1/4			
020	0229_SW233_210816		16/08/2021 05:01 PM	Water	ALS: 2 Non ALS: 0	No			Partial 1/4		
021	0229_SD233_210816		16/08/2021 05:02 PM	Soil	ALS: 1 Non ALS: 0	No		Partial 1/4			
022	0229_SD220_210816		16/08/2021 03:45 PM	Soil	ALS: 1 Non ALS: 0	No		Partial 1/4			
023	0229_SW220_210816		16/08/2021 03:45 PM	Water	ALS: 2 Non ALS: 0	No			Partial 1/4		
024	0229_SW232_210816		16/08/2021 03:20 PM	Water	ALS: 2 Non ALS: 0	No			Partial 1/4		
025	0229_SD232_210816		16/08/2021 03:20 PM	Soil	ALS: 1 Non ALS: 0	No		Partial 1/4			
026	0229_QC300_210816		16/08/2021 06:10 PM	Water	ALS: 2 Non ALS: 0	No			Partial 1/4		
027	0229_QC301_210816		16/08/2021 06:11 PM	Water	ALS: 2 Non ALS: 0	No			Partial 1/4		

RELINQUISHED BY:
DATE TIME:

RECEIVED BY:
DATE TIME:

RELINQUISHED BY:
DATE TIME:

RECEIVED BY:
DATE TIME:

CLIENT: AECOMAU - AECOM Australia Pty Ltd

PROJECT: QLD_0229_PFSOMP_20

SITE: QLD_0229

ORDER NO:

PROJECT MANAGER:

PRIMARY SAMPLER:

EMAIL REPORTS TO:

EMAIL INVOICES TO:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

CONTACT PH:

QUOTE NO: TV/007/21 - Compass

SAMPLER MOBILE:

/ ET2021AECOMAU000
1

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	Analysis NOT REQUIRED	Sediments SEDIMENT	Waters WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
028	0229_MW119_210816		17/08/2021 09:10 AM	Water	ALS: 2 Non ALS: 0	No			Partial 1/4		
029	0229_MW125I_210817		17/08/2021 11:04 AM	Water	ALS: 2 Non ALS: 0	No			Partial 1/4		
030	0229_MW125S_210817		17/08/2021 11:19 AM	Water	ALS: 4 Non ALS: 0	No			Partial 1/4		Extra vol for lab QC
031	0229_MW124_210817		17/08/2021 11:50 AM	Water	ALS: 4 Non ALS: 0	No			Partial 1/4		Extra vol for lab QC
032	0229_MW116_210818		18/08/2021 08:43 AM	Water	ALS: 4 Non ALS: 0	No			Partial 1/4		Extra vol for lab QC
033	0229_MW141_210817		17/08/2021 01:29 PM	Water	ALS: 2 Non ALS: 0	No			Partial 1/4		
034	0229_MW115_210818		18/08/2021 09:00 AM	Water	ALS: 2 Non ALS: 0	No			Partial 1/4		
035	0229_MW117S_210817		17/08/2021 03:34 PM	Water	ALS: 2 Non ALS: 0	No			Partial 1/4		
036	0229_MW117D_210817		17/08/2021 03:47 PM	Water	ALS: 2 Non ALS: 0	No			Partial 1/4		

RELINQUISHED BY:

RECEIVED BY:

RELINQUISHED BY:

RECEIVED BY:

DATE TIME:

DATE TIME:

DATE TIME:

DATE TIME:

CLIENT: AECOMAU - AECOM Australia Pty Ltd

PROJECT: QLD_0229_PFASOMP_20

SITE: QLD_0229

ORDER NO:

PROJECT MANAGER:

PRIMARY SAMPLER:

EMAIL REPORTS TO:

EMAIL INVOICES TO:



CONTACT PH:

SAMPLER MOBILE:

QUOTE NO: TV/007/21 - Compass

/ ET2021AECOMAU000

1

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

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

SAMPLE DETAILS							ANALYSIS REQUIRED				
SAMPLE	NAME	DESCRIPTION	DATE / TIME	MATRIX	TOTAL BOTTLES	ON HOLD	Analysis NOT REQUIRED	Sediments SEDIMENT	Waters WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
037	0229_QC302_210817		17/08/2021 05:20 PM	Water	ALS: 2 Non ALS: 0	No			Partial 1/4		
038	0229_MW135_210818		18/08/2021 09:41 AM	Water	ALS: 4 Non ALS: 0	No			Partial 1/4		Extra vol for lab QC
039	0229_MW018_210818		18/08/2021 10:08 AM	Water	ALS: 2 Non ALS: 0	No			Partial 1/4		
040	0229_QC104_210818		18/08/2021 10:09 AM	Water	ALS: 2 Non ALS: 0	No			Partial 1/4		
041	0229_MW114_210818		18/08/2021 10:32 AM	Water	ALS: 2 Non ALS: 0	No			Partial 1/4		
042	0229_MW128_210818		18/08/2021 10:58 AM	Water	ALS: 4 Non ALS: 0	No			Partial 1/4		Extra vol for lab QC
043	0229_MW105_210818		18/08/2021 11:56 AM	Water	ALS: 2 Non ALS: 0	No			Partial 1/4		
044	0229_QC105_210818		18/08/2021 11:56 AM	Water	ALS: 2 Non ALS: 0	No			Partial 1/4		
045	0229_MW101_210818		18/08/2021 12:24 PM	Water	ALS: 2 Non ALS: 0	No			Partial 1/4		

RELINQUISHED BY:
 DATE TIME:

RECEIVED BY:
 DATE TIME:

RELINQUISHED BY:
 DATE TIME:

RECEIVED BY:
 DATE TIME:

CLIENT: AECOMAU - AECOM Australia Pty Ltd
 PROJECT: QLD_0229_PFSOMP_20
 SITE: QLD_0229
 ORDER NO:
 PROJECT MANAGER: [REDACTED]
 PRIMARY SAMPLER: [REDACTED]
 EMAIL REPORTS TO: [REDACTED]
 EMAIL INVOICES TO: [REDACTED]

TURNAROUND REQUIREMENTS : 5 Days
 Biohazard info:

CONTACT PH: SAMPLER MOBILE:
 QUOTE NO: TV/007/21 - Compass / ET2021AECOMAU000
 1

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	Analysis NOT REQUIRED	Sediments SEDIMENT	Waters WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
046	0229_QC106_210818		18/08/2021 12:24 PM	Water	ALS: 2 Non ALS: 0	No			Partial 1/4		
047	0229_MW102_210818		18/08/2021 01:26 PM	Water	ALS: 4 Non ALS: 0	No			Partial 1/4		Extra vol for lab QC
048	0229_MW106_210818		18/08/2021 01:26 PM	Water	ALS: 4 Non ALS: 0	No			Partial 1/4		Extra vol for lab QC
049	0229_SD113_210818		18/08/2021 01:33 PM	Soil	ALS: 1 Non ALS: 0	No		Partial 1/4			
050	0229_MW118_210817		17/08/2021 03:20 PM	Water	ALS: 2 Non ALS: 0	No			Partial 1/4		
051	0229_MW138_210818		18/08/2021 02:02 PM	Water	ALS: 4 Non ALS: 0	No			Partial 1/4		Extra vol for lab QC
052	0229_SD119_210818		18/08/2021 02:20 PM	Soil	ALS: 1 Non ALS: 0	No		Partial 1/4			
053	0229_SW119_210818		18/08/2021 02:20 PM	Water	ALS: 2 Non ALS: 0	No			Partial 1/4		
054	0229_MW220S_210818		18/08/2021 02:36 PM	Water	ALS: 2 Non ALS: 0	No			Partial 1/4		

RELINQUISHED BY:
 DATE TIME:

RECEIVED BY:
 DATE TIME:

RELINQUISHED BY:
 DATE TIME:

RECEIVED BY:
 DATE TIME:

CLIENT: AECOMAU - AECOM Australia Pty Ltd

PROJECT: QLD_0229_PFSOMP_20

SITE: QLD_0229

ORDER NO:

PROJECT MANAGER:

PRIMARY SAMPLER:

EMAIL REPORTS TO:

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:

CONTACT PH: SAMPLER MOBILE:
 QUOTE NO: TV/007/21 - Compass / ET2021AECOMAU000
 1

SAMPLE DETAILS							ANALYSIS REQUIRED				
SAMPLE	NAME	DESCRIPTION	DATE / TIME	MATRIX	TOTAL BOTTLES	ON HOLD	Analysis NOT REQUIRED	Sediments SEDIMENT	Waters WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
055	0229_QC107_210818		18/08/2021 02:47 PM	Soil	ALS: 1 Non ALS: 0	No		Partial 1/4			
056	0229_SD120_210818		18/08/2021 02:47 PM	Soil	ALS: 1 Non ALS: 0	No		Partial 1/4			
057	0229_SW135_210818		18/08/2021 03:02 PM	Water	ALS: 2 Non ALS: 0	No			Partial 1/4		
058	0229_SD135_210818		18/08/2021 03:03 PM	Soil	ALS: 1 Non ALS: 0	No		Partial 1/4			
059	0229_MW233_210818		18/08/2021 03:07 PM	Water	ALS: 2 Non ALS: 0	No			Partial 1/4		
060	0229_MW212_210818		18/08/2021 03:33 PM	Water	ALS: 2 Non ALS: 0	No			Partial 1/4		
061	0229_SW134_210818		18/08/2021 03:40 PM	Water	ALS: 4 Non ALS: 0	No			Partial 1/4		Extra vol for lab qc
062	0229_SD134_210818		18/08/2021 03:41 PM	Soil	ALS: 1 Non ALS: 0	No		Partial 1/4			
063	0229_QC305_210818		18/08/2021 03:57 PM	Water	ALS: 2 Non ALS: 0	No			Partial 1/4		

RELINQUISHED BY:
 DATE TIME:

RECEIVED BY:
 DATE TIME:

RELINQUISHED BY:
 DATE TIME:

RECEIVED BY:
 DATE TIME:

CLIENT: AECOMAU - AECOM Australia Pty Ltd
 PROJECT: QLD_0229_PFSOMP_20
 SITE: QLD_0229
 ORDER NO:

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: SAMPLER MOBILE:
 PRIMARY SAMPLER: [REDACTED] QUOTE NO: TV/007/21 - Compass / ET2021AECOMAU000
 1
 EMAIL REPORTS TO: [REDACTED]
 EMAIL INVOICES TO: [REDACTED]

SAMPLE DETAILS							ANALYSIS REQUIRED				
SAMPLE	NAME	DESCRIPTION	DATE / TIME	MATRIX	TOTAL BOTTLES	ON HOLD	Analysis NOT REQUIRED	Sediments SEDIMENT	Waters WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
064	0229_MW122_210818		18/08/2021 12:10 PM	Water	ALS: 2 Non ALS: 0	No			Partial 1/4		
065	0229_MW217_210818		18/08/2021 03:20 PM	Water	ALS: 2 Non ALS: 0	No			Partial 1/4		
066	0229_MW065_210818		18/08/2021 10:35 AM	Water	ALS: 2 Non ALS: 0	No			Partial 1/4		
067	0229_MW123I_210818		18/08/2021 09:40 AM	Water	ALS: 2 Non ALS: 0	No			Partial 1/4		
068	0229_MW123S_210818		18/08/2021 10:15 AM	Water	ALS: 2 Non ALS: 0	No			Partial 1/4		
069	0229_SD130_210818		18/08/2021 04:03 PM	Soil	ALS: 1 Non ALS: 0	No		Partial 1/4			
070	0229_MW121_210818		18/08/2021 01:10 PM	Water	ALS: 2 Non ALS: 0	No			Partial 1/4		
071	0229_MW235S_210818		18/08/2021 03:50 PM	Water	ALS: 2 Non ALS: 0	No			Partial 1/4		
072	0229_MW139_210818		18/08/2021 02:20 PM	Water	ALS: 2 Non ALS: 0	No			Partial 1/4		

CLIENT: AECOMAU - AECOM Australia Pty Ltd

PROJECT: QLD_0229_PFASOMP_20

SITE: QLD_0229

ORDER NO:

PROJECT MANAGER:

PRIMARY SAMPLER:

EMAIL REPORTS TO:

EMAIL INVOICES TO:

RELINQUISHED BY:

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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:

CONTACT PH:

SAMPLER MOBILE:

QUOTE NO: TV/007/21 - Compass


/ ET2021AECOMAU000

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SAMPLE DETAILS

ANALYSIS REQUIRED

SAMPLE	NAME	DESCRIPTION	DATE / TIME	MATRIX	TOTAL BOTTLES	ON HOLD	Analysis NOT REQUIRED	Sediments SEDIMENT	Waters WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
073	0229_MW120_210818		18/08/2021 01:45 PM	Water	ALS: 2 Non ALS: 0	No			Partial 1/4		
074	0229_MW003_210818		18/08/2021 11:20 AM	Water	ALS: 2 Non ALS: 0	No			Partial 1/4		
075	0229_QC306_210818		18/08/2021 04:00 PM	Water	ALS: 2 Non ALS: 0	No			Partial 1/4		
076	0229_SD129_210818		18/08/2021 04:14 PM	Soil	ALS: 1 Non ALS: 0	No		Partial 1/4			
077	0229_SD128_210818		18/08/2021 04:22 PM	Soil	ALS: 1 Non ALS: 0	No		Partial 1/4			
078	0229_SD126_210818		18/08/2021 04:32 PM	Soil	ALS: 1 Non ALS: 0	No		Partial 1/4			
079	0229_SW244_210818		18/08/2021 10:12 AM	Water	ALS: 2 Non ALS: 0	No			Partial 1/4		
080	0229_SD244_210818		18/08/2021 10:00 AM	Soil	ALS: 1 Non ALS: 0	No		Partial 1/4			
081	0229_QC102_210818		18/08/2021 10:00 AM	Soil	ALS: 1 Non ALS: 0	No		Partial 1/4			

 CHAIN OF CUSTODY COC#: 26431 ALS Laboratory: ET Townsville		RELINQUISHED BY: DATE TIME:	RECEIVED BY: DATE TIME:	RELINQUISHED BY: DATE TIME:	RECEIVED BY: DATE TIME:
CLIENT: AECOMAU - AECOM Australia Pty Ltd PROJECT: QLD_0229_PFSOMP_20 SITE: QLD_0229 ORDER NO:		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: TV/007/21 - Compass / ET2021AECOMAU0001			
EMAIL REPORTS TO: [REDACTED]					
EMAIL INVOICES TO: [REDACTED]					

SAMPLE DETAILS							ANALYSIS REQUIRED				
SAMPLE	NAME	DESCRIPTION	DATE / TIME	MATRIX	TOTAL BOTTLES	ON HOLD	Analysis NOT REQUIRED	Sediments SEDIMENT	Waters WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
082	0229_SW245_210818		18/08/2021 08:20 AM	Water	ALS: 2 Non ALS: 0	No			Partial 1/4		
083	0229_SD245_210818		18/08/2021 08:20 AM	Soil	ALS: 1 Non ALS: 0	No		Partial 1/4			
084	0229_QC103_210818		18/08/2021 10:00 AM	Water	ALS: 2 Non ALS: 0	No			Partial 1/4		
085	0229_SW227_210818		18/08/2021 11:05 AM	Water	ALS: 2 Non ALS: 0	No			Partial 1/4		
086	0229_SD227_210818		18/08/2021 11:05 AM	Soil	ALS: 1 Non ALS: 0	No		Partial 1/4			
087	0229_QC307_210818		18/08/2021 05:40 PM	Water	ALS: 2 Non ALS: 0	No			Partial 1/4		
088	0229_MW236S_210819		19/08/2021 08:54 AM	Water	ALS: 2 Non ALS: 0	No			Partial 1/4		
089	0229_MW131_210819		19/08/2021 09:30 AM	Water	ALS: 2 Non ALS: 0	No			Partial 1/4		
090	0229_QC108_210819		19/08/2021 09:31 AM	Water	ALS: 2 Non ALS: 0	No					

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 PROJECT: QLD_0229_PFASOMP_20
 SITE: QLD_0229
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 PROJECT MANAGER: [REDACTED]
 PRIMARY SAMPLER: [REDACTED]
 EMAIL REPORTS TO: [REDACTED]
 EMAIL INVOICES TO: [REDACTED]

TURNAROUND REQUIREMENTS : 5 Days
 Biohazard info:

CONTACT PH: SAMPLER MOBILE:
 QUOTE NO: TV/007/21 - Compass / ET2021AECOMAU000
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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	Analysis NOT REQUIRED	Sediments SEDIMENT	Waters WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
091	0229_MW074_210819		19/08/2021 10:01 AM	Water	ALS: 4 Non ALS: 0	No			Partial 1/4		Extra vol for lab QC
092	0229_MW002_210819		19/08/2021 10:30 AM	Water	ALS: 4 Non ALS: 0	No			Partial 1/4		Extra vol for lab QC
093	0229_SD205_210819		19/08/2021 08:15 AM	Soil	ALS: 1 Non ALS: 0	No		Partial 1/4			
094	0229_SD217_210819		19/08/2021 10:40 AM	Soil	ALS: 1 Non ALS: 0	No		Partial 1/4			
095	0229_MW205S_210819		19/08/2021 08:35 AM	Water	ALS: 2 Non ALS: 0	No			Partial 1/4		
096	0229_SW217_210819		19/08/2021 10:40 AM	Water	ALS: 2 Non ALS: 0	No			Partial 1/4		
097	0229_SW205_210819		19/08/2021 08:15 AM	Water	ALS: 2 Non ALS: 0	No			Partial 1/4		
098	0229_SD203_210819		19/08/2021 11:16 AM	Soil	ALS: 1 Non ALS: 0	No		Partial 1/4			
099	0229_SW203_210819		19/08/2021 11:16 AM	Water	ALS: 2 Non ALS: 0	No			Partial 1/4		

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 PROJECT: QLD_0229_PFASOMP_20
 SITE: QLD_0229
 ORDER NO:
 PROJECT MANAGER: [REDACTED]
 PRIMARY SAMPLER: [REDACTED]
 EMAIL REPORTS TO: [REDACTED]
 EMAIL INVOICES TO: [REDACTED]

TURNAROUND REQUIREMENTS : 5 Days
 Biohazard info:
 CONTACT PH: SAMPLER MOBILE:
 QUOTE NO: TV/007/21 - Compass / ET2021AECOMAU000
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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	Analysis NOT REQUIRED	Sediments SEDIMENT	Waters WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
100	0229_QC308_210819		19/08/2021 11:25 AM	Water	ALS: 2 Non ALS: 0	No			Partial 1/4		
101	0229_QC309_210819		19/08/2021 11:25 AM	Water	ALS: 2 Non ALS: 0	No			Partial 1/4		
102	0229_QC303_210818		18/08/2021 12:30 PM	Water	ALS: 2 Non ALS: 0	No			Partial 1/4		
103	0229_QC304_210818		18/08/2021 12:30 PM	Water	ALS: 2 Non ALS: 0	No			Partial 1/4		
104	0229_MW232_210820		20/08/2021 11:18 AM	Water	ALS: 2 Non ALS: 0	No			Partial 1/4		
105	0229_MW072_210820		20/08/2021 11:39 AM	Water	ALS: 2 Non ALS: 0	No			Partial 1/4		
106	0229_QC310_210820		20/08/2021 11:47 AM	Water	ALS: 2 Non ALS: 0	No			Partial 1/4		

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PROJECT: QLD_0229_PFASOMP_20

SITE: QLD_0229

ORDER NO:

PROJECT MANAGER:

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EMAIL REPORTS TO:

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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:

CONTACT PH:

SAMPLER MOBILE:

QUOTE NO: TV/007/21 - Compass

/ ET2021AECOMAU000

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SAMPLE	SAMPLE NAME	PARTIAL ANALYSIS GROUP NAME	MATRIX	SELECTED ANALYSIS NAME
001	0229_QC500_210816	Waters WATER	Water	- EP231X PFAS - Full Suite (28 analytes)
002	0229_SW144_210816	Waters WATER	Water	- EP231X PFAS - Full Suite (28 analytes)
003	0229_SD144_210816	Sediments SEDIMENT	Soil	- EP231X (solids) PFAS - Full Suite (28 analytes)
004	0229_SD110_210816	Sediments SEDIMENT	Soil	- EP231X (solids) PFAS - Full Suite (28 analytes)
005	0229_SD109_210816	Sediments SEDIMENT	Soil	- EP231X (solids) PFAS - Full Suite (28 analytes)
006	0229_SW139_210816	Waters WATER	Water	- EP231X PFAS - Full Suite (28 analytes)
007	0229_SD139_210816	Sediments SEDIMENT	Soil	- EP231X (solids) PFAS - Full Suite (28 analytes)
008	0229_QC101_210816	Sediments SEDIMENT	Soil	- EP231X (solids) PFAS - Full Suite (28 analytes)
009	0229_SD140_210816	Sediments SEDIMENT	Soil	- EP231X (solids) PFAS - Full Suite (28 analytes)
010	0229_QC100_210816	Waters WATER	Water	- EP231X PFAS - Full Suite (28 analytes)
011	0229_SW140_210816	Waters WATER	Water	- EP231X PFAS - Full Suite (28 analytes)
012	0229_SW243_210816	Waters WATER	Water	- EP231X PFAS - Full Suite (28 analytes)
013	0229_SD243_210816	Sediments SEDIMENT	Soil	- EP231X (solids) PFAS - Full Suite (28 analytes)
014	0229_SD242_210816	Sediments SEDIMENT	Soil	- EP231X (solids) PFAS - Full Suite (28 analytes)
015	0229_SW242_210816	Waters WATER	Water	- EP231X PFAS - Full Suite (28 analytes)

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CONTACT PH: SAMPLER MOBILE:
 QUOTE NO: TV/007/21 - Compass / ET2021AECOMAU000
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EMAIL REPORTS TO:

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:

016	0229_SD136_210816	Sediments SEDIMENT	Soil	- EP231X (solids) PFAS - Full Suite (28 analytes)
017	0229_SW121_210816	Waters WATER	Water	- EP231X PFAS - Full Suite (28 analytes)
018	0229_SD121_210816	Sediments SEDIMENT	Soil	- EP231X (solids) PFAS - Full Suite (28 analytes)
019	0229_SD133_210816	Sediments SEDIMENT	Soil	- EP231X (solids) PFAS - Full Suite (28 analytes)
020	0229_SW233_210816	Waters WATER	Water	- EP231X PFAS - Full Suite (28 analytes)
021	0229_SD233_210816	Sediments SEDIMENT	Soil	- EP231X (solids) PFAS - Full Suite (28 analytes)
022	0229_SD220_210816	Sediments SEDIMENT	Soil	- EP231X (solids) PFAS - Full Suite (28 analytes)
023	0229_SW220_210816	Waters WATER	Water	- EP231X PFAS - Full Suite (28 analytes)
024	0229_SW232_210816	Waters WATER	Water	- EP231X PFAS - Full Suite (28 analytes)
025	0229_SD232_210816	Sediments SEDIMENT	Soil	- EP231X (solids) PFAS - Full Suite (28 analytes)
026	0229_QC300_210816	Waters WATER	Water	- EP231X PFAS - Full Suite (28 analytes)
027	0229_QC301_210816	Waters WATER	Water	- EP231X PFAS - Full Suite (28 analytes)
028	0229_MW119_210816	Waters WATER	Water	- EP231X PFAS - Full Suite (28 analytes)
029	0229_MW125I_210817	Waters WATER	Water	- EP231X PFAS - Full Suite (28 analytes)
030	0229_MW125S_210817	Waters WATER	Water	- EP231X PFAS - Full Suite (28 analytes)
031	0229_MW124_210817	Waters WATER	Water	- EP231X PFAS - Full Suite (28 analytes)

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 PROJECT: QLD_0229_PFASOMP_20
 SITE: QLD_0229
 ORDER NO:

PROJECT MANAGER: [REDACTED]
 PRIMARY SAMPLER: [REDACTED]

CONTACT PH: [REDACTED] SAMPLER MOBILE: [REDACTED]
 QUOTE NO: TV/007/21 - Compass / ET2021AECOMAU0001

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:

032	0229_MW116_210818	Waters WATER	Water	- EP231X PFAS - Full Suite (28 analytes)
033	0229_MW141_210817	Waters WATER	Water	- EP231X PFAS - Full Suite (28 analytes)
034	0229_MW115_210818	Waters WATER	Water	- EP231X PFAS - Full Suite (28 analytes)
035	0229_MW117S_210817	Waters WATER	Water	- EP231X PFAS - Full Suite (28 analytes)
036	0229_MW117D_210817	Waters WATER	Water	- EP231X PFAS - Full Suite (28 analytes)
037	0229_QC302_210817	Waters WATER	Water	- EP231X PFAS - Full Suite (28 analytes)
038	0229_MW135_210818	Waters WATER	Water	- EP231X PFAS - Full Suite (28 analytes)
039	0229_MW018_210818	Waters WATER	Water	- EP231X PFAS - Full Suite (28 analytes)
040	0229_QC104_210818	Waters WATER	Water	- EP231X PFAS - Full Suite (28 analytes)
041	0229_MW114_210818	Waters WATER	Water	- EP231X PFAS - Full Suite (28 analytes)
042	0229_MW128_210818	Waters WATER	Water	- EP231X PFAS - Full Suite (28 analytes)
043	0229_MW105_210818	Waters WATER	Water	- EP231X PFAS - Full Suite (28 analytes)
044	0229_QC105_210818	Waters WATER	Water	- EP231X PFAS - Full Suite (28 analytes)
045	0229_MW101_210818	Waters WATER	Water	- EP231X PFAS - Full Suite (28 analytes)
046	0229_QC106_210818	Waters WATER	Water	- EP231X PFAS - Full Suite (28 analytes)
047	0229_MW102_210818	Waters WATER	Water	- EP231X PFAS - Full Suite (28 analytes)

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PROJECT MANAGER: [REDACTED]
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EMAIL REPORTS TO: [REDACTED]

EMAIL INVOICES TO: [REDACTED]

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

048	0229_MW100_210818	Waters WATER	Water	- EP231X PFAS - Full Suite (28 analytes)
049	0229_SD113_210818	Sediments SEDIMENT	Soil	- EP231X (solids) PFAS - Full Suite (28 analytes)
050	0229_MW118_210817	Waters WATER	Water	- EP231X PFAS - Full Suite (28 analytes)
051	0229_MW138_210818	Waters WATER	Water	- EP231X PFAS - Full Suite (28 analytes)
052	0229_SD119_210818	Sediments SEDIMENT	Soil	- EP231X (solids) PFAS - Full Suite (28 analytes)
053	0229_SW119_210818	Waters WATER	Water	- EP231X PFAS - Full Suite (28 analytes)
054	0229_MW220S_210818	Waters WATER	Water	- EP231X PFAS - Full Suite (28 analytes)
055	0229_QC107_210818	Sediments SEDIMENT	Soil	- EP231X (solids) PFAS - Full Suite (28 analytes)
056	0229_SD120_210818	Sediments SEDIMENT	Soil	- EP231X (solids) PFAS - Full Suite (28 analytes)
057	0229_SW135_210818	Waters WATER	Water	- EP231X PFAS - Full Suite (28 analytes)
058	0229_SD135_210818	Sediments SEDIMENT	Soil	- EP231X (solids) PFAS - Full Suite (28 analytes)
059	0229_MW233_210818	Waters WATER	Water	- EP231X PFAS - Full Suite (28 analytes)
060	0229_MW212_210818	Waters WATER	Water	- EP231X PFAS - Full Suite (28 analytes)
061	0229_SW134_210818	Waters WATER	Water	- EP231X PFAS - Full Suite (28 analytes)
062	0229_SD134_210818	Sediments SEDIMENT	Soil	- EP231X (solids) PFAS - Full Suite (28 analytes)
063	0229_QC305_210818	Waters WATER	Water	- EP231X PFAS - Full Suite (28 analytes)

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PROJECT MANAGER: [REDACTED]
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 EMAIL REPORTS TO: [REDACTED]
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 Custody Seal intact? Yes No N/A
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064	0229_MW122_210818	Waters WATER	Water	- EP231X PFAS - Full Suite (28 analytes)
065	0229_MW217_210818	Waters WATER	Water	- EP231X PFAS - Full Suite (28 analytes)
066	0229_MW065_210818	Waters WATER	Water	- EP231X PFAS - Full Suite (28 analytes)
067	0229_MW123I_210818	Waters WATER	Water	- EP231X PFAS - Full Suite (28 analytes)
068	0229_MW123S_210818	Waters WATER	Water	- EP231X PFAS - Full Suite (28 analytes)
069	0229_SD130_210818	Sediments SEDIMENT	Soil	- EP231X (solids) PFAS - Full Suite (28 analytes)
070	0229_MW121_210818	Waters WATER	Water	- EP231X PFAS - Full Suite (28 analytes)
071	0229_MW235S_210818	Waters WATER	Water	- EP231X PFAS - Full Suite (28 analytes)
072	0229_MW139_210818	Waters WATER	Water	- EP231X PFAS - Full Suite (28 analytes)
073	0229_MW120_210818	Waters WATER	Water	- EP231X PFAS - Full Suite (28 analytes)
074	0229_MW003_210818	Waters WATER	Water	- EP231X PFAS - Full Suite (28 analytes)
075	0229_QC306_210818	Waters WATER	Water	- EP231X PFAS - Full Suite (28 analytes)
076	0229_SD129_210818	Sediments SEDIMENT	Soil	- EP231X (solids) PFAS - Full Suite (28 analytes)
077	0229_SD128_210818	Sediments SEDIMENT	Soil	- EP231X (solids) PFAS - Full Suite (28 analytes)
078	0229_SD126_210818	Sediments SEDIMENT	Soil	- EP231X (solids) PFAS - Full Suite (28 analytes)
079	0229_SW244_210818	Waters WATER	Water	- EP231X PFAS - Full Suite (28 analytes)

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PROJECT MANAGER: [REDACTED]
 PRIMARY SAMPLER: [REDACTED]

EMAIL REPORTS TO: [REDACTED]

EMAIL INVOICES TO: [REDACTED]

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 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:

080	0229_SD244_210818	Sediments SEDIMENT	Soil	- EP231X (solids) PFAS - Full Suite (28 analytes)
081	0229_QC102_210818	Sediments SEDIMENT	Soil	- EP231X (solids) PFAS - Full Suite (28 analytes)
082	0229_SW245_210818	Waters WATER	Water	- EP231X PFAS - Full Suite (28 analytes)
083	0229_SD245_210818	Sediments SEDIMENT	Soil	- EP231X (solids) PFAS - Full Suite (28 analytes)
084	0229_QC103_210818	Waters WATER	Water	- EP231X PFAS - Full Suite (28 analytes)
085	0229_SW227_210818	Waters WATER	Water	- EP231X PFAS - Full Suite (28 analytes)
086	0229_SD227_210818	Sediments SEDIMENT	Soil	- EP231X (solids) PFAS - Full Suite (28 analytes)
087	0229_QC307_210818	Waters WATER	Water	- EP231X PFAS - Full Suite (28 analytes)
088	0229_MW236S_210819	Waters WATER	Water	- EP231X PFAS - Full Suite (28 analytes)
089	0229_MW131_210819	Waters WATER	Water	- EP231X PFAS - Full Suite (28 analytes)
091	0229_MW074_210819	Waters WATER	Water	- EP231X PFAS - Full Suite (28 analytes)
092	0229_MW002_210819	Waters WATER	Water	- EP231X PFAS - Full Suite (28 analytes)
093	0229_SD205_210819	Sediments SEDIMENT	Soil	- EP231X (solids) PFAS - Full Suite (28 analytes)
094	0229_SD217_210819	Sediments SEDIMENT	Soil	- EP231X (solids) PFAS - Full Suite (28 analytes)
095	0229_MW205S_210819	Waters WATER	Water	- EP231X PFAS - Full Suite (28 analytes)
096	0229_SW217_210819	Waters WATER	Water	- EP231X PFAS - Full Suite (28 analytes)

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CLIENT: AECOMAU - AECOM Australia Pty Ltd
 PROJECT: QLD_0229_PFASOMP_20
 SITE: QLD_0229
 ORDER NO:

PROJECT MANAGER:
 PRIMARY SAMPLER:

CONTACT PH: SAMPLER MOBILE:
 QUOTE NO: TV/007/21 - Compass / ET2021AECOMAU000
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EMAIL REPORTS TO:

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:

097	0229_SW205_210819	Waters WATER	Water	- EP231X PFAS - Full Suite (28 analytes)
098	0229_SD203_210819	Sediments SEDIMENT	Soil	- EP231X (solids) PFAS - Full Suite (28 analytes)
099	0229_SW203_210819	Waters WATER	Water	- EP231X PFAS - Full Suite (28 analytes)
100	0229_QC308_210819	Waters WATER	Water	- EP231X PFAS - Full Suite (28 analytes)
101	0229_QC309_210819	Waters WATER	Water	- EP231X PFAS - Full Suite (28 analytes)
102	0229_QC303_210818	Waters WATER	Water	- EP231X PFAS - Full Suite (28 analytes)
103	0229_QC304_210818	Waters WATER	Water	- EP231X PFAS - Full Suite (28 analytes)
104	0229_MW232_210820	Waters WATER	Water	- EP231X PFAS - Full Suite (28 analytes)
105	0229_MW072_210820	Waters WATER	Water	- EP231X PFAS - Full Suite (28 analytes)
106	0229_QC310_210820	Waters WATER	Water	- EP231X PFAS - Full Suite (28 analytes)

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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	0229_QC500_210816	HDPE (no PTFE)	20 mL	00352010056604	Grey	No	
001	0229_QC500_210816	HDPE (no PTFE)	20 mL	00352010056629	Grey	No	
002	0229_SW144_210816	HDPE (no PTFE)	20 mL	00352010056733	Grey	No	
002	0229_SW144_210816	HDPE (no PTFE)	20 mL	00352010056499	Grey	No	
003	0229_SD144_210816	HDPE Soil Jar	200 mL	00620719071578	Grey	No	
004	0229_SD110_210816	HDPE Soil Jar	200 mL	00620719071670	Grey	No	
005	0229_SD109_210816	HDPE Soil Jar	200 mL	00620719071557	Grey	No	
006	0229_SW139_210816	HDPE (no PTFE)	20 mL	00352010056722	Grey	No	
006	0229_SW139_210816	HDPE (no PTFE)	20 mL	00352010056775	Grey	No	
007	0229_SD139_210816	HDPE Soil Jar	200 mL	00620219019630	Grey	No	
008	0229_QC101_210816	HDPE Soil Jar	200 mL	00620719071654	Grey	No	
009	0229_SD140_210816	HDPE Soil Jar	200 mL	00620719071669	Grey	No	
010	0229_QC100_210816	HDPE (no PTFE)	20 mL	00352010056603	Grey	No	
010	0229_QC100_210816	HDPE (no PTFE)	20 mL	00352010056687	Grey	No	
011	0229_SW140_210816	HDPE (no PTFE)	20 mL	00352010056759	Grey	No	
011	0229_SW140_210816	HDPE (no PTFE)	20 mL	00352010056698	Grey	No	
012	0229_SW243_210816	HDPE (no PTFE)	20 mL	00352010056765	Grey	No	
012	0229_SW243_210816	HDPE (no PTFE)	20 mL	00352010056785	Grey	No	
012	0229_SW243_210816	HDPE (no PTFE)	20 mL	00352010056642	Grey	No	
012	0229_SW243_210816	HDPE (no PTFE)	20 mL	00352010056565	Grey	No	
013	0229_SD243_210816	HDPE Soil Jar	200 mL	00620719071627	Grey	No	
014	0229_SD242_210816	HDPE Soil Jar	200 mL	00620219019650	Grey	No	
015	0229_SW242_210816	HDPE (no PTFE)	20 mL	00352010056741	Grey	No	
015	0229_SW242_210816	HDPE (no PTFE)	20 mL	00352010056649	Grey	No	
016	0229_SD136_210816	HDPE Soil Jar	200 mL	00620719071604	Grey	No	
017	0229_SW121_210816	HDPE (no PTFE)	20 mL	00352010056781	Grey	No	

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017	0229_SW121_210816	HDPE (no PTFE)	20 mL	00352010056789	Grey	No	
018	0229_SD121_210816	HDPE Soil Jar	200 mL	00621019048990	Grey	No	
019	0229_SD133_210816	HDPE Soil Jar	200 mL	00620719018144	Grey	No	
020	0229_SW233_210816	HDPE (no PTFE)	20 mL	00352010056774	Grey	No	
020	0229_SW233_210816	HDPE (no PTFE)	20 mL	00352010056530	Grey	No	
021	0229_SD233_210816	HDPE Soil Jar	200 mL	00620219019621	Grey	No	
022	0229_SD220_210816	HDPE Soil Jar	200 mL	00620719018165	Grey	No	
023	0229_SW220_210816	HDPE (no PTFE)	20 mL	00352010056750	Grey	No	
023	0229_SW220_210816	HDPE (no PTFE)	20 mL	00352010056776	Grey	No	
024	0229_SW232_210816	HDPE (no PTFE)	20 mL	00352010056512	Grey	No	
024	0229_SW232_210816	HDPE (no PTFE)	20 mL	00352010056581	Grey	No	
025	0229_SD232_210816	HDPE Soil Jar	200 mL	00620219019597	Grey	No	
026	0229_QC300_210816	HDPE (no PTFE)	20 mL	00352010056563	Grey	No	
026	0229_QC300_210816	HDPE (no PTFE)	20 mL	00352010056598	Grey	No	
027	0229_QC301_210816	HDPE (no PTFE)	20 mL	00352010056569	Grey	No	
027	0229_QC301_210816	HDPE (no PTFE)	20 mL	00352010056740	Grey	No	
028	0229_MW119_210816	HDPE (no PTFE)	20 mL	00352010056545	Grey	No	
028	0229_MW119_210816	HDPE (no PTFE)	20 mL	00352010056645	Grey	No	
029	0229_MW125I_210817	HDPE (no PTFE)	20 mL	00352010056510	Grey	No	
029	0229_MW125I_210817	HDPE (no PTFE)	20 mL	00352010056514	Grey	No	
030	0229_MW125S_210817	HDPE (no PTFE)	20 mL	00352010056780	Grey	No	
030	0229_MW125S_210817	HDPE (no PTFE)	20 mL	00352010056737	Grey	No	
030	0229_MW125S_210817	HDPE (no PTFE)	20 mL	00352010056663	Grey	No	
030	0229_MW125S_210817	HDPE (no PTFE)	20 mL	00352010056764	Grey	No	
031	0229_MW124_210817	HDPE (no PTFE)	20 mL	00352010056607	Grey	No	
031	0229_MW124_210817	HDPE (no PTFE)	20 mL	00352010056786	Grey	No	
031	0229_MW124_210817	HDPE (no PTFE)	20 mL	00352010056758	Grey	No	

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SITE: QLD_0229

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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:

031	0229_MW124_210817	HDPE (no PTFE)	20 mL	00352010056595	Grey	No	
032	0229_MW116_210818	HDPE (no PTFE)	20 mL	00352010056533	Grey	No	
032	0229_MW116_210818	HDPE (no PTFE)	20 mL	00352010056542	Grey	No	
032	0229_MW116_210818	HDPE (no PTFE)	20 mL	00352010056502	Grey	No	
032	0229_MW116_210818	HDPE (no PTFE)	20 mL	00352010056744	Grey	No	
033	0229_MW141_210817	HDPE (no PTFE)	20 mL	00352010056576	Grey	No	
033	0229_MW141_210817	HDPE (no PTFE)	20 mL	00352010056690	Grey	No	
034	0229_MW115_210818	HDPE (no PTFE)	20 mL	00352010056577	Grey	No	
034	0229_MW115_210818	HDPE (no PTFE)	20 mL	00352010056543	Grey	No	
035	0229_MW117S_210817	HDPE (no PTFE)	20 mL	00352010056608	Grey	No	
035	0229_MW117S_210817	HDPE (no PTFE)	20 mL	00352010056657	Grey	No	
036	0229_MW117D_210817	HDPE (no PTFE)	20 mL	00352010056652	Grey	No	
036	0229_MW117D_210817	HDPE (no PTFE)	20 mL	00352010056700	Grey	No	
037	0229_QC302_210817	HDPE (no PTFE)	20 mL	00352010056612	Grey	No	
037	0229_QC302_210817	HDPE (no PTFE)	20 mL	00352010056498	Grey	No	
038	0229_MW135_210818	HDPE (no PTFE)	20 mL	00352010056757	Grey	No	
038	0229_MW135_210818	HDPE (no PTFE)	20 mL	00352010056641	Grey	No	
038	0229_MW135_210818	HDPE (no PTFE)	20 mL	00352010056555	Grey	No	
038	0229_MW135_210818	HDPE (no PTFE)	20 mL	00352010056560	Grey	No	
039	0229_MW018_210818	HDPE (no PTFE)	20 mL	00352010056506	Grey	No	
039	0229_MW018_210818	HDPE (no PTFE)	20 mL	00352010056547	Grey	No	
040	0229_QC104_210818	HDPE (no PTFE)	20 mL	00352010056648	Grey	No	
040	0229_QC104_210818	HDPE (no PTFE)	20 mL	00352010056526	Grey	No	
041	0229_MW114_210818	HDPE (no PTFE)	20 mL	00352010056558	Grey	No	
041	0229_MW114_210818	HDPE (no PTFE)	20 mL	00352010056495	Grey	No	
042	0229_MW128_210818	HDPE (no PTFE)	20 mL	00352010056677	Grey	No	
042	0229_MW128_210818	HDPE (no PTFE)	20 mL	00352010056658	Grey	No	

CLIENT: AECOMAU - AECOM Australia Pty Ltd

PROJECT: QLD_0229_PFASOMP_20

SITE: QLD_0229

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Other comments:

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042	0229_MW128_210818	HDPE (no PTFE)	20 mL	00352010056718	Grey	No	
042	0229_MW128_210818	HDPE (no PTFE)	20 mL	00352010056777	Grey	No	
043	0229_MW105_210818	HDPE (no PTFE)	20 mL	00352010065715	Grey	No	
043	0229_MW105_210818	HDPE (no PTFE)	20 mL	00352010065703	Grey	No	
044	0229_QC105_210818	HDPE (no PTFE)	20 mL	00352010065544	Grey	No	
044	0229_QC105_210818	HDPE (no PTFE)	20 mL	00352010065643	Grey	No	
045	0229_MW101_210818	HDPE (no PTFE)	20 mL	00352010065673	Grey	No	
045	0229_MW101_210818	HDPE (no PTFE)	20 mL	00352010065694	Grey	No	
046	0229_QC106_210818	HDPE (no PTFE)	20 mL	00352010065659	Grey	No	
046	0229_QC106_210818	HDPE (no PTFE)	20 mL	00352010065500	Grey	No	
047	0229_MW102_210818	HDPE (no PTFE)	20 mL	00352010065525	Grey	No	
047	0229_MW102_210818	HDPE (no PTFE)	20 mL	00352010056549	Grey	No	
047	0229_MW102_210818	HDPE (no PTFE)	20 mL	00352010065497	Grey	No	
047	0229_MW102_210818	HDPE (no PTFE)	20 mL	00352010056551	Grey	No	
048	0229_MW106_210818	HDPE (no PTFE)	20 mL	00352010065433	Grey	No	
048	0229_MW106_210818	HDPE (no PTFE)	20 mL	00352010065572	Grey	No	
048	0229_MW106_210818	HDPE (no PTFE)	20 mL	00352010065622	Grey	No	
048	0229_MW106_210818	HDPE (no PTFE)	20 mL	00352010065592	Grey	No	
049	0229_SD113_210818	HDPE Soil Jar	200 mL	00620219019649	Grey	No	
050	0229_MW118_210817	HDPE (no PTFE)	20 mL	00352010056784	Grey	No	
050	0229_MW118_210817	HDPE (no PTFE)	20 mL	00352010056638	Grey	No	
051	0229_MW138_210818	HDPE (no PTFE)	20 mL	00352010065696	Grey	No	
051	0229_MW138_210818	HDPE (no PTFE)	20 mL	00352010065641	Grey	No	
051	0229_MW138_210818	HDPE (no PTFE)	20 mL	00352010065586	Grey	No	
051	0229_MW138_210818	HDPE (no PTFE)	20 mL	00352010065717	Grey	No	
052	0229_SD119_210818	HDPE Soil Jar	200 mL	00620219019608	Grey	No	
053	0229_SW119_210818	HDPE (no PTFE)	20 mL	00352010065675	Grey	No	

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 PROJECT: QLD_0229_PFSOMP_20
 SITE: QLD_0229
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PROJECT MANAGER: [REDACTED]
 PRIMARY SAMPLER: [REDACTED]
 EMAIL REPORTS TO: [REDACTED]
 EMAIL INVOICES TO: [REDACTED]

TURNAROUND REQUIREMENTS : 5 Days
 Biohazard info:

CONTACT PH: [REDACTED] SAMPLER MOBILE: [REDACTED]
 QUOTE NO: TV/007/21 - Compass / ET2021AECOMAU0001

LABORATORY USE ONLY (Circle)
 Custody Seal intact? Yes No N/A
 Free ice / frozen ice bricks present upon receipt? Yes No N/A
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053	0229_SW119_210818	HDPE (no PTFE)	20 mL	00352010065714	Grey	No	
054	0229_MW220S_210818	HDPE (no PTFE)	20 mL	00352010065685	Grey	No	
054	0229_MW220S_210818	HDPE (no PTFE)	20 mL	00352010065562	Grey	No	
055	0229_QC107_210818	HDPE Soil Jar	200 mL	00620219019710	Grey	No	
056	0229_SD120_210818	HDPE Soil Jar	200 mL	00620219019708	Grey	No	
057	0229_SW135_210818	HDPE (no PTFE)	20 mL	00352010056516	Grey	No	
057	0229_SW135_210818	HDPE (no PTFE)	20 mL	00352010056666	Grey	No	
058	0229_SD135_210818	HDPE Soil Jar	200 mL	00620219019619	Grey	No	
059	0229_MW233_210818	HDPE (no PTFE)	20 mL	00352010065516	Grey	No	
059	0229_MW233_210818	HDPE (no PTFE)	20 mL	00352010065606	Grey	No	
060	0229_MW212_210818	HDPE (no PTFE)	20 mL	00352010065669	Grey	No	
060	0229_MW212_210818	HDPE (no PTFE)	20 mL	00352010065705	Grey	No	
061	0229_SW134_210818	HDPE (no PTFE)	20 mL	00352010065534	Grey	No	
061	0229_SW134_210818	HDPE (no PTFE)	20 mL	00352010065625	Grey	No	
061	0229_SW134_210818	HDPE (no PTFE)	20 mL	00352010065699	Grey	No	
061	0229_SW134_210818	HDPE (no PTFE)	20 mL	00352010065687	Grey	No	
062	0229_SD134_210818	HDPE Soil Jar	200 mL	00620219019629	Grey	No	
063	0229_QC305_210818	HDPE (no PTFE)	20 mL	00352010065596	Grey	No	
063	0229_QC305_210818	HDPE (no PTFE)	20 mL	00352010065716	Grey	No	
064	0229_MW122_210818	HDPE (no PTFE)	20 mL	00352010056619	Grey	No	
064	0229_MW122_210818	HDPE (no PTFE)	20 mL	00352010056588	Grey	No	
065	0229_MW217_210818	HDPE (no PTFE)	20 mL	00352010065677	Grey	No	
065	0229_MW217_210818	HDPE (no PTFE)	20 mL	00352010065682	Grey	No	
066	0229_MW065_210818	HDPE (no PTFE)	20 mL	00352010056617	Grey	No	
066	0229_MW065_210818	HDPE (no PTFE)	20 mL	00352010056626	Grey	No	
067	0229_MW1231_210818	HDPE (no PTFE)	20 mL	00352010056548	Grey	No	
067	0229_MW1231_210818	HDPE (no PTFE)	20 mL	00352010056511	Grey	No	

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 Other comments:

068	0229_MW		20 mL	00352010056768	Grey	No	
068	0229_MW123S_210818	HDPE (no PTFE)	20 mL	00352010056763	Grey	No	
069	0229_SD130_210818	HDPE Soil Jar	200 mL	00620719071666	Grey	No	
070	0229_MW121_210818	HDPE (no PTFE)	20 mL	00352010065499	Grey	No	
070	0229_MW121_210818	HDPE (no PTFE)	20 mL	00352010065665	Grey	No	
071	0229_MW235S_210818	HDPE (no PTFE)	20 mL	00352010065654	Grey	No	
071	0229_MW235S_210818	HDPE (no PTFE)	20 mL	00352010065448	Grey	No	
072	0229_MW139_210818	HDPE (no PTFE)	20 mL	00352010065519	Grey	No	
072	0229_MW139_210818	HDPE (no PTFE)	20 mL	00352010065583	Grey	No	
073	0229_MW120_210818	HDPE (no PTFE)	20 mL	00352010065521	Grey	No	
073	0229_MW120_210818	HDPE (no PTFE)	20 mL	00352010065495	Grey	No	
074	0229_MW003_210818	HDPE (no PTFE)	20 mL	00352010056662	Grey	No	
074	0229_MW003_210818	HDPE (no PTFE)	20 mL	00352010056676	Grey	No	
075	0229_QC306_210818	HDPE (no PTFE)	20 mL	00352010065530	Grey	No	
075	0229_QC306_210818	HDPE (no PTFE)	20 mL	00352010065646	Grey	No	
076	0229_SD129_210818	HDPE Soil Jar	200 mL	00620719019396	Grey	No	
077	0229_SD128_210818	HDPE Soil Jar	200 mL	00620219019636	Grey	No	
078	0229_SD126_210818	HDPE Soil Jar	200 mL	00620219019656	Grey	No	
079	0229_SW244_210818	HDPE (no PTFE)	20 mL	00352010056615	Grey	No	
079	0229_SW244_210818	HDPE (no PTFE)	20 mL	00352010056622	Grey	No	
080	0229_SD244_210818	HDPE Soil Jar	200 mL	00620219019707	Grey	No	
081	0229_QC102_210818	HDPE Soil Jar	200 mL	00620219019666	Grey	No	
082	0229_SW245_210818	HDPE (no PTFE)	20 mL	00352010056610	Grey	No	
082	0229_SW245_210818	HDPE (no PTFE)	20 mL	00352010056664	Grey	No	
083	0229_SD245_210818	HDPE Soil Jar	200 mL	00620719071675	Grey	No	
084	0229_QC103_210818	HDPE (no PTFE)	20 mL	00352010056681	Grey	No	
084	0229_QC103_210818	HDPE (no PTFE)	20 mL	00352010056624	Grey	No	

CLIENT: AECOMAU - AECOM Australia Pty Ltd

PROJECT: QLD_0229_PFSOMP_20

SITE: QLD_0229

ORDER NO:

PROJECT MANAGER:

PRIMARY SAMPLER:

EMAIL REPORTS TO:

EMAIL INVOICES TO:

RELINQUISHED BY:
DATE TIME:

RECEIVED BY:
DATE TIME:

RELINQUISHED BY:
DATE TIME:

RECEIVED BY:
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:

CONTACT PH: SAMPLER MOBILE:
 QUOTE NO: TV/007/21 - Compass / ET2021AECOMAU000
 1

085	0229_SW227_210818	HDPE (no PTFE)	20 mL	00352010056736	Grey	No	
085	0229_SW227_210818	HDPE (no PTFE)	20 mL	00352010056623	Grey	No	
086	0229_SD227_210818	HDPE Soil Jar	200 mL	00620219019693	Grey	No	
087	0229_QC307_210818	HDPE (no PTFE)	20 mL	00352010065647	Grey	No	
087	0229_QC307_210818	HDPE (no PTFE)	20 mL	00352010065666	Grey	No	
088	0229_MW236S_210819	HDPE (no PTFE)	20 mL	00352010065690	Grey	No	
088	0229_MW236S_210819	HDPE (no PTFE)	20 mL	00352010065549	Grey	No	
089	0229_MW131_210819	HDPE (no PTFE)	20 mL	00352010065582	Grey	No	
089	0229_MW131_210819	HDPE (no PTFE)	20 mL	00352010065468	Grey	No	
090	0229_QC108_210819	HDPE (no PTFE)	20 mL	00352010065608	Grey	No	
090	0229_QC108_210819	HDPE (no PTFE)	20 mL	00352010065506	Grey	No	
091	0229_MW074_210819	HDPE (no PTFE)	20 mL	00352010065470	Grey	No	
091	0229_MW074_210819	HDPE (no PTFE)	20 mL	00352010065540	Grey	No	
091	0229_MW074_210819	HDPE (no PTFE)	20 mL	00352010065567	Grey	No	
091	0229_MW074_210819	HDPE (no PTFE)	20 mL	00352010065610	Grey	No	
092	0229_MW002_210819	HDPE (no PTFE)	20 mL	00352010065698	Grey	No	
092	0229_MW002_210819	HDPE (no PTFE)	20 mL	00352010065672	Grey	No	
092	0229_MW002_210819	HDPE (no PTFE)	20 mL	00352010065541	Grey	No	
092	0229_MW002_210819	HDPE (no PTFE)	20 mL	00352010065707	Grey	No	
093	0229_SD205_210819	HDPE Soil Jar	200 mL	00620719071598	Grey	No	
094	0229_SD217_210819	HDPE Soil Jar	200 mL	00620719071545	Grey	No	
095	0229_MW205S_210819	HDPE (no PTFE)	20 mL	00352010065618	Grey	No	
095	0229_MW205S_210819	HDPE (no PTFE)	20 mL	00352010065543	Grey	No	
096	0229_SW217_210819	HDPE (no PTFE)	20 mL	00352010065706	Grey	No	
096	0229_SW217_210819	HDPE (no PTFE)	20 mL	00352010065570	Grey	No	
097	0229_SW205_210819	HDPE (no PTFE)	20 mL	00352010065645	Grey	No	
097	0229_SW205_210819	HDPE (no PTFE)	20 mL	00352010065721	Grey	No	



CHAIN OF CUSTODY

COC#: 26431 ALS Laboratory: ET Townsville

RELINQUISHED BY:

RECEIVED BY:

RELINQUISHED BY:

RECEIVED BY:

DATE TIME:

DATE TIME:

DATE TIME:

DATE TIME:

CLIENT: AECOMAU - AECOM Australia Pty Ltd

PROJECT: QLD_0229_PFASOMP_20

SITE: QLD_0229

ORDER NO:

PROJECT MANAGER:

PRIMARY SAMPLER:

EMAIL REPORTS TO:

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:

CONTACT PH:

SAMPLER MOBILE:

QUOTE NO: TV/007/21 - Compass

/ ET2021AECOMAU000

1

098	0229_SD203_210819	HDPE (no PTFE)	200 mL	00620719071668	Grey	No	
099	0229_SW203_210819	HDPE (no PTFE)	20 mL	00352010065668	Grey	No	
099	0229_SW203_210819	HDPE (no PTFE)	20 mL	00352010065563	Grey	No	
100	0229_QC308_210819	HDPE (no PTFE)	20 mL	00352010065548	Grey	No	
100	0229_QC308_210819	HDPE (no PTFE)	20 mL	00352010065513	Grey	No	
101	0229_QC309_210819	HDPE (no PTFE)	20 mL	00352010065667	Grey	No	
101	0229_QC309_210819	HDPE (no PTFE)	20 mL	00352010065458	Grey	No	
102	0229_QC303_210818	HDPE (no PTFE)	20 mL	00352010056503	Grey	No	
102	0229_QC303_210818	HDPE (no PTFE)	20 mL	00352010056655	Grey	No	
103	0229_QC304_210818	HDPE (no PTFE)	20 mL	00352010056587	Grey	No	
103	0229_QC304_210818	HDPE (no PTFE)	20 mL	00352010056541	Grey	No	
104	0229_MW232_210820	HDPE (no PTFE)	20 mL	00352010065670	Grey	No	
104	0229_MW232_210820	HDPE (no PTFE)	20 mL	00352010065633	Grey	No	
105	0229_MW072_210820	HDPE (no PTFE)	20 mL	00352010065686	Grey	No	
105	0229_MW072_210820	HDPE (no PTFE)	20 mL	00352010065602	Grey	No	
106	0229_QC310_210820	HDPE (no PTFE)	20 mL	00352010065489	Grey	No	
106	0229_QC310_210820	HDPE (no PTFE)	20 mL	00352010065704	Grey	No	

Total Bottle Count: ALS: 205, Non ALS: 0




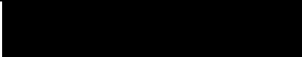
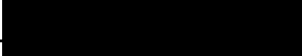

Environmental Division
Townsville
Work Order Reference
ET2103923



Telephone : -61 7 4773 0000

Custody Document for Submissions via ALS Compass App


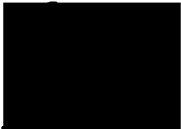
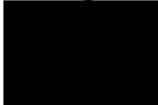
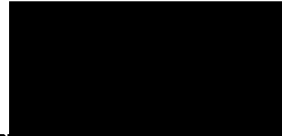
Project: QLD-0229-PFAS OMR-28 Client: AECOM

Project Manager: 
Phone: ()
Sampler: 
Phone: ()

ALS Compass COC Reference: 26598 # Samples: 4

Turnaround Requirements: Standard Urgent

Special Instructions:

Custody:			
Relinquished by: 	Received by:  ALS TSU	Relinquished by: 	Received by: 
Date / Time: 20/8/21 12:10	Date / Time: 20/8/21 12:10	Date / Time: 23/8/21 16:00	Date / Time: 24-08-21 08:25

RELINQUISHED BY:
 DATE TIME:

RECEIVED BY:
 DATE TIME:

RELINQUISHED BY:
 DATE TIME:

RECEIVED BY:
 DATE TIME:

CLIENT: AECOMAU - AECOM Australia Pty Ltd
 PROJECT: QLD_0229_PFSOMP_20
 SITE: QLD_0229
 ORDER NO:

TURNAROUND REQUIREMENTS : 0 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]
 EMAIL REPORTS TO: [REDACTED]
 EMAIL INVOICES TO: [REDACTED]

CONTACT PH: [REDACTED] SAMPLER MOBILE: [REDACTED]
 QUOTE NO: TV/007/21 - Compass / ET2021AECOMAU0001

SAMPLE DETAILS							ANALYSIS REQUIRED				
SAMPLE	NAME	DESCRIPTION	DATE / TIME	MATRIX	TOTAL BOTTLES	ON HOLD	Analysis NOT REQUIRED	Sediments SEDIMENT	Waters WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
001	0229_SW211_210819			Water	ALS: 0 Non ALS: 0	No					
002	0229_SW212_210819		19/08/2021 09:30 AM	Water	ALS: 2 Non ALS: 0	No			Partial 1/4		
003	0229_SD211_210819		19/08/2021 09:50 AM	Soil	ALS: 1 Non ALS: 0	No		Partial 1/4			
004	0229_SD212_210819		19/08/2021 09:30 AM	Soil	ALS: 1 Non ALS: 0	No		Partial 1/4			

CLIENT: AECOMAU - AECOM Australia Pty Ltd

PROJECT: QLD_0229_PFASOMP_20

SITE: QLD_0229

ORDER NO:

PROJECT MANAGER: [REDACTED]
 PRIMARY SAMPLER: [REDACTED]

CONTACT PH: [REDACTED] SAMPLER MOBILE: [REDACTED]
 QUOTE NO: TV/007/21 - Compass / ET2021AECOMAU000
 1

EMAIL REPORTS TO: [REDACTED]

EMAIL INVOICES TO:

RELINQUISHED BY:
 DATE TIME:

RECEIVED BY:
 DATE TIME:

RELINQUISHED BY:
 DATE TIME:

RECEIVED BY:
 DATE TIME:

TURNAROUND REQUIREMENTS : 0 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	0229_SW212_210819	Waters WATER	Water	- EP231X PFAS - Full Suite (28 analytes)
003	0229_SD211_210819	Sediments SEDIMENT	Soil	- EP231X (solids) PFAS - Full Suite (28 analytes)
004	0229_SD212_210819	Sediments SEDIMENT	Soil	- EP231X (solids) PFAS - Full Suite (28 analytes)

CLIENT: AECOMAU - AECOM Australia Pty Ltd

PROJECT: QLD_0229_PFASOMP_20

SITE: QLD_0229

ORDER NO:

PROJECT MANAGER: [REDACTED]

PRIMARY SAMPLER: [REDACTED]

EMAIL REPORTS TO: [REDACTED]

EMAIL INVOICES TO:

RELINQUISHED BY:

DATE TIME:

RECEIVED BY:

DATE TIME:

RELINQUISHED BY:

DATE TIME:

RECEIVED BY:

DATE TIME:

TURNAROUND REQUIREMENTS : 0 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:

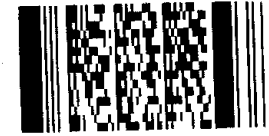
CONTACT PH: SAMPLER MOBILE:
 QUOTE NO: TV/007/21 - Compass / ET2021AECOMAU000
 1

SAMPLE	SAMPLE NAME	BOTTLE NAME	VOLUME	BARCODE	TYPE	FILTERED	REASON
002	0229_SW212_210819	HDPE (no PTFE)	20 mL	00352010065697	Grey	No	
002	0229_SW212_210819	HDPE (no PTFE)	20 mL	00352010065632	Grey	No	
003	0229_SD211_210819	HDPE Soil Jar	200 mL	00620719071564	Grey	No	
004	0229_SD212_210819	HDPE Soil Jar	200 mL	00620719071579	Grey	No	

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



Environmental Division
Townsville
Work Order Reference
ET2103889



Telephone : + 61 7 4773 0000

Custody Document for Submissions via ALS Compass App

Project: QID-0229-PFAS OMP-20 Client: AECOM Project Manager: [Redacted]
 Phone: ([Redacted])
 ALS Compass COC Reference: 26578 # Samples: 1 Sampler: [Redacted]
 Phone: ([Redacted])
 Turnaround Requirements: Standard Urgent _____

Special Instructions:

Custody:			
Relinquished by: [Redacted]	Received by: [Redacted] ALS TSU	Relinquished by: [Redacted]	Received by: [Redacted]
Date / Time: 20/8/21 12:10	Date / Time: 20/8/21 1210	Date / Time: 23/8/21 1500	Date / Time: 24-8-21 08:25

R

RELINQUISHED BY:
 DATE TIME:

RECEIVED BY:
 DATE TIME:

RELINQUISHED BY:
 DATE TIME:

RECEIVED BY:
 DATE TIME:

CLIENT: AECOMAU - AECOM Australia Pty Ltd
 PROJECT: QLD_0229_PFASOMP_20
 SITE: QLD_0229
 ORDER NO:

PROJECT MANAGER: [REDACTED]
 PRIMARY SAMPLER: [REDACTED]

EMAIL REPORTS TO: [REDACTED]

EMAIL INVOICES TO: [REDACTED]

TURNAROUND REQUIREMENTS : 0 Days
 Biohazard info:

CONTACT PH: SAMPLER MOBILE:
 QUOTE NO: TV/007/21 - Compass / ET2021AECOMAU000
 1

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	Waters WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
001	0229_MW226_210819		19/08/2021 07:34 AM	Water	ALS: 2 Non ALS: 0	No	Partial 1/4		

CHAIN OF CUSTODY
 (ALS) COC#: 26578 ALS Laboratory: ET Townsville

RELINQUISHED BY:
 DATE TIME:

RECEIVED BY:
 DATE TIME:

RELINQUISHED BY:
 DATE TIME:

RECEIVED BY:
 DATE TIME:

CLIENT: AECOMAU - AECOM Australia Pty Ltd
 PROJECT: QLD_0229_PFASOMP_20
 SITE: QLD_0229
 ORDER NO:

PROJECT MANAGER: [REDACTED]
 PRIMARY SAMPLER: [REDACTED]

EMAIL REPORTS TO: [REDACTED]

EMAIL INVOICES TO:

TURNAROUND REQUIREMENTS : 0 Days
 Biohazard info:

CONTACT PH: SAMPLER MOBILE:
 QUOTE NO: TV/007/21 - Compass / ET2021AECOMAU000
 1

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

SAMPLE	SAMPLE NAME	PARTIAL ANALYSIS GROUP NAME	MATRIX	SELECTED ANALYSIS NAME
001	0229_MW226_210819	Waters WATER	Water	- EP231X PFAS - Full Suite (28 analytes)

CHAIN OF CUSTODY
 (ALS) COC#: 26578 ALS Laboratory: ET Townsville

CLIENT: AECOMAU - AECOM Australia Pty Ltd

PROJECT: QLD_0229_PFASOMP_20

SITE: QLD_0229

ORDER NO:

PROJECT MANAGER: [REDACTED]
 PRIMARY SAMPLER: [REDACTED]

CONTACT PH: [REDACTED] SAMPLER MOBILE: [REDACTED]
 QUOTE NO: TV/007/21 - Compass / ET2021AECOMAU000
 1

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 : 0 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	0229_MW226_210819	HDPE (no PTFE)	20 mL	00352010065644	Grey	No	
001	0229_MW226_210819	HDPE (no PTFE)	20 mL	00352010065581	Grey	No	

Total Bottle Count: ALS: 2, Non ALS: 0

CHAIN OF CUSTODY DOCUMENTATION

CLIENT: **AECOM Australia**
 ADDRESS / OFFICE: AECOM Townsville, level 5,7-13 Tomlins St, South Townsville
 PROJECT MANAGER (PM): [REDACTED]
 PROJECT ID: QLD_0229_PFSOMP_20
 SITE: QLD_0229 P.O. NO.: 60612487_3.1
 ANALYSIS REQUIRED including SUITES (note - suite codes must be listed to attract suite prices)

RESULTS REQUIRED (Date): Standard TAT QUOTE NO.:
 FOR LABORATORY USE ONLY
 COOLER SEAL (circle appropriate)
 Intact: Yes No N/A
 SAMPLE TEMPERATURE
 CHILLED: Yes No
 COMMENTS / SPECIAL HANDLING / STORAGE OR DISPOSAL:
 WATER - PFAS Standard 28 analyses
 SOIL - PFAS Standard 28 analyses
 Notes: e.g. Highly contaminated samples e.g. "High PAHs expected".
 Extra volume for QC or trace LORs etc.
AECO06/210830
Dec: 16/9/21

ID	SAMPLE ID	MATRIX	DATE	Time	Type / Code	Total bottles	WATER - PFAS Standard 28 analyses	SOIL - PFAS Standard 28 analyses	HOLD	Barcode	
										Barcode 1	Barcode 2
	0229_QC200_210816	W	16.08.21	13:08	1 x P	1	X			N21/020199	
	0229_QC201_210816	S	16.08.21	13:06	1 x P	1		X		N21/020200	
	0229_QC202_210816	S	16.08.21	10:00	1 x P	1		X		N21/020201	
	0229_QC203_210816	W	16.08.21	10:00	1 x P	1	X			N21/020202	
	0229_QC204_210816	W	16.08.21	10:09	1 x P	1	X			N21/020203	
	0229_QC205_210816	W	16.08.21	11:56	1 x P	1	X			N21/020204	
	0229_QC206_210816	W	16.08.21	12:24	1 x P	1	X			N21/020205	
	0229_QC207_210816	S	16.08.21	14:47	1 x P	1		X		N21/020206	
	0229_QC208_210816	W	19.08.21	09:31	1 x P	1	X			N21/020207	

RV

RECEIVED
 30 AUG 2021
 BY: [REDACTED] 12:00

DISMISSED BY: [REDACTED] 26/8/21 0800
 RECEIVED BY: [REDACTED]
 Name: [REDACTED] Date: [REDACTED]
 Of: AECOM Time: 0800
 Name: [REDACTED] Date: [REDACTED]
 Of: [REDACTED] Time: [REDACTED]

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

Appendix E

Calibration Certificates

Oil / Water Interface Meter

Instrument **Interface Meter (60M)**
Serial No. **288052**



airmet

Air-Met Scientific Pty Ltd
1300 137 067

Item	Test	Pass	Comments
Battery	Compartment	✓	
	Capacity	✓	
	above 7.9V	✓	
Probe	Cleaned/Decon.	✓	
	Operation	✓	
Connectors	Condition	✓	
		✓	
Tape Check	Cleaned	✓	
	Connectors Checked for cuts	✓	
Instrument Test	At surface level	✓	

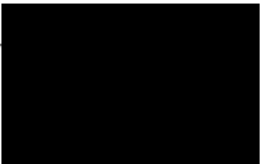
Certificate of Calibration

This is to certify that the above instrument has been cleaned and tested.

Tested by: _____

Test date: **10/08/2021**

Next Test due: **10/11/2021**



Sollinst Model 122 Interface Meter

Instrument **Interface Meter (30M)**
Serial No. **312512**



airmet

Air-Met Scientific Pty Ltd
1300 137 067

Item	Test	Pass	Comments
Battery	Compartment	✓	
	Capacity	✓	
Probe	Cleaned/Decon.	✓	
	Operation	✓	
Connectors	Condition	✓	
		✓	
Tape Check	Cleaned	✓	
	Connectors	Checked for cuts	✓
Instrument Test	At surface level	✓	

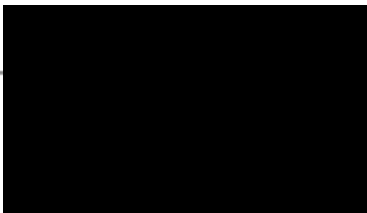
Certificate of Calibration

This is to certify that the above instrument has been cleaned and tested.

Calibrated by:

Calibration date: 10/08/2021

Next calibration due: 10/11/2021



Multi Parameter Water Meter



airmet

Air-Met Scientific Pty Ltd
1300 137 067

Instrument YSI Quatro Pro Plus
Serial No. 18J104323

Item	Test	Pass	Comments	
Battery	Charge Condition	✓		
	Fuses	✓		
	Capacity	✓		
Switch/keypad	Operation	✓		
	Display	Intensity	✓	
		Operation (segments)	✓	
Grill Filter	Condition	✓		
	Seal	✓		
PCB	Condition	✓		
Connectors	Condition	✓		
Sensor	1. pH	✓		
	2. mV	✓		
	3. EC	✓		
	4. D.O	✓		
	5. Temp	✓		
Alarms	Beeper			
	Settings			
Software	Version			
Data logger	Operation			
Download	Operation			
Other tests:				

Certificate of Calibration

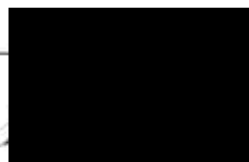
This is to certify that the above instrument has been calibrated to the following specifications:

Sensor	Serial no	Standard Solutions	Certified	Solution Bottle Number	Instrument Reading
1. pH 7.00		pH 7.02	NIST	363895	pH 7.02
2. pH 4.00		pH 4.00	NIST	368314	pH 4.00
3. mV		238.2mV	NIST	358632/357174	238.2mV
4. EC		2760uS	NIST	366823	2760uS
6. D.O		0%	NIST	10959	0%
7. Temp	5601113	20.8°C	NIST	Testominl	20.8°C

Calibrated by:

Calibration date: 10/08/2021

Next calibration due: 10/02/2022



Multi Parameter Water Meter



airmet

Air-Met Scientific Pty Ltd
1300 137 067

Instrument YSI Quatro Pro Plus
Serial No. 19D105097

Item	Test	Pass	Comments
Battery	Charge Condition	✓	
	Fuses	✓	
	Capacity	✓	
Switch/keypad	Operation	✓	
	Display	✓	
Grill Filter	Operation (segments)	✓	
	Condition	✓	
PCB	Seal	✓	
	Condition	✓	
Connectors	Condition	✓	
	Sensor	✓	
Sensor	1. pH	✓	
	2. mV	✓	
	3. EC	✓	
	4. D.O	✓	
	5. Temp	✓	
Alarms	Beeper		
	Settings		
Software	Version		
Data logger	Operation		
Download	Operation		
Other tests:			

Certificate of Calibration

This is to certify that the above instrument has been calibrated to the following specifications:

Sensor	Serial no	Standard Solutions	Certified	Solution Bottle Number	Instrument Reading
1. pH 7.00		pH 7.02	NIST	368681	pH 7.02
2. pH 4.00		pH 4.00	NIST	368314	ph 4.00
3. mV		238.0mV	NIST	358632/357174	238.0mV
4. EC		2760uS	NIST	366823	2761uS
6. D.O		0%	NIST	10959	0%
7. Temp		20.9°C	NIST	Testo Mini901	20.9°C

Calibrated by:

Calibration date:

10-Aug-21

Next calibration due:

10-Feb-22





Calibration Certificate

AirMet Scientific P/L
 135 Sydney Street
 Mackay
 QLD 4740, Australia
 Tel: 07 4951 7500
 Fax: 07 4951 7575

This document certifies that the instrument detailed has been calibrated to the parameters

Certificate Print Date: 16-Nov-2020 Call ID / Order No: 246888
 Calibration Date: 16-Nov-2020 Job No / Pack No: S2468880001
 Next Calibration Due: 16-Nov-2021

Customer: AECOM Australia Pty Ltd (Townsville)-ID **Serial No:** 18K102334
 407250
Description: Xylem ProDSS Handheld, No GPS

Calibration Summary

Frequency: 1 Years **Temp:** 24.2°C **As Found:** Out of Tolerance **Result:** Pass
Humidity: 45% **Certificate:** S2468880001

<u>Desc</u>	<u>As Found</u>		<u>As Left (Cal Status)</u>	
	<u>Actual</u>	<u>Result</u>	<u>Actual</u>	<u>Result</u>
PH4 (4.00)	3.91	Pass	4.0	Pass
PH7 (7.01)	6.85	Pass	7.01	Pass
Cond (2707uS/cm)	2773.0	Fail	2707.0	Pass
DO (0.0%)	0.0	Pass	0.0	Pass
Turbidity (100NTU)	110.73	Fail	99.42	Pass
ORP (231.9mV)	277.3	Fail	231.7	Pass

<u>Equip ID</u>	<u>Standard Used Description</u>	<u>Valid Until</u>	<u>Cert</u>
-----------------	----------------------------------	--------------------	-------------

Completed By: _____



Signed: _____



ANZ

FQM - Water Quality Meter Calibration Record

Q4AN(EV)-410-FM1

Project Name:	PFAS AMP LAMARCK		Project Number:	60612497-3.1	
Project Location:	LAMARCK BARRACKS		Client:	DEPT OF DEFENCE	
PM Name:	[REDACTED]		Fieldwork Staff Name:	[REDACTED]	
This calibration record is intended to prompt fieldwork staff to calibrate water quality meter (WQM) daily before the start of fieldworks.					
INSTRUMENT DETAILS					
Supplier:	YSI		AIAMET		
Make and Model:	1 st D105097				
Serial Number:					
CALIBRATION					
CALIBRATE WITH CALIBRATION SOLUTIONS					
Date and Time:	16/08/2018 10:15				
Parameter	Acidity		Conductivity	Dissolved Oxygen	
Units	pH 7	pH 4	µS/cm	ppm O ₂	ppm
Calibration Standard Concentration:	7.02	4.00	2662	251	100%
Calibration Reading:	6.97	3.98	2647	259.7	99.8%
Calibration Temperature:	23.1	23.1	22.2	25.6	25
ONGOING CHECKS					
BUMP TEST WITH CALIBRATION SOLUTION					
Date and Time:	17/8/21 07:56				
Parameter	Acidity		Conductivity	Radox	Dissolved Oxygen
Units	pH 7	pH 4	µS/cm	ppm	ppm
Calibration Standard Concentration:	7.0	4.0	2655	234.7	100%
Bump Test Reading:	7.06	4.05	2649	242.3	
Bump Test Temperature:	22.5	22.9	23.1	22.9	
COMMENTS					
Detail any equipment faults, minor maintenance performed, change of batteries or technical support provided.					
Approval and Distribution					
<input checked="" type="checkbox"/> Each individual instrument has been inspected and calibrated daily and bump tested as required by fieldwork staff.					
[REDACTED]			17/8/21		
Fieldwork Staff Signature			Date		
Distribution: Project Central File					

ANZ

FQM - Water Quality Meter Calibration Record

Q4AN(EV)-410-FM1

Project Name:	PTAS DWP LAVERACK	Project Number:	60612487-3.1
Project Location:	LAVERACK DAM	Client:	DEPT OF DEFENCE
PM Name:		Fieldwork Staff Name:	

This calibration record is intended to prompt fieldwork staff to calibrate water quality meter (WQM) daily before the start of fieldworks.

INSTRUMENT DETAILS

Supplier:	ARMET
Make and Model:	YSI
Serial Number:	19D105097

CALIBRATION

CALIBRATE WITH CALIBRATION SOLUTIONS

Date and Time:	18/8/21				
Parameter	Acidity		Conductivity	Dissolved Oxygen	
Units	pH	pH	µS/cm	ppm	ppm
Calibration Standard Concentration:	7	4	2848	100%	251
Calibration Reading:	7.02	4.03	2848	99.77	250.7
Calibration Temperature:	19.8	17.8	19.5	20.1	15.2

ONGOING CHECKS

BUMP TEST WITH CALIBRATION SOLUTION

Date and Time:					
Parameter	Acidity		Conductivity	Dissolved Oxygen	
Units	pH	pH	µS/cm	ppm	ppm
Calibration Standard Concentration:					
Bump Test Reading:					
Bump Test Temperature:					

COMMENTS

Detail any equipment faults, minor maintenance performed, change of batteries or technical support provided.

Approval and Distribution

Each individual instrument has been inspected and calibrated daily and bump tested as required by fieldwork staff.

_____ 18/8/21 _____
 Fieldwork Staff Signature Date

Distribution: Project Central File

ANZ

FQM - Water Quality Meter Calibration Record

Q4AN(EV)-410-FM1

Project Name:	AFAS OMC		Project Number:	60612487	
Project Location:	AVARACK		Client:	DEFENCE	
PM Name:	[REDACTED]		Fieldwork Staff Name:	[REDACTED]	
<small>This section is intended to prompt fieldwork staff to calibrate water quality meter (WQM) daily before the start of fieldwork.</small>					
INSTRUMENT DETAILS					
Supplier:	AIRMET				
Make and Model:	YSI PRO PLUS				
Serial Number:	19J104323				
CALIBRATION					
CALIBRATE WITH CALIBRATION SOLUTIONS					
Date and Time:	19/8/21		0745		
Parameter	Acidity		Conductivity	ORP	Dissolved Oxygen
Units	pH	pH	µS/cm	MV ppm	ppm %
Calibration Standard Concentration:	7.00	4.00	2602	235.5	100
Calibration Reading:	6.99	3.93	2720	222.2	81.3
Calibration Temperature:	21.7	21.9	21.8	22.4	25.3 26.2
ONGOING CHECKS					
BUMP TEST WITH CALIBRATION SOLUTION					
Date and Time:	19/8/21		0715		
Parameter	Acidity		Conductivity	ORP	Dissolved Oxygen
Units	pH	pH	µS/cm	MV ppm	ppm %
Calibration Standard Concentration:	7.00	4.00	1305	237.5	100
Bump Test Reading:	2.06	4.01	1444	237.4	124.0
Bump Test Temperature:	20.8°C	21.8°C	21.0	20.6	18.1
COMMENTS					
<small>Detail any equipment faults, minor maintenance performed, change of batteries or technical support provided.</small>					
Approval and Distribution					
<input type="checkbox"/> Each individual instrument has been inspected and calibrated daily and bump tested as required by fieldwork staff.					
_____ Fieldwork Staff Signature			_____ Date		
Distribution: Project Central File					

ANZ

FQM - Water Quality Meter Calibration Record

QIAN(EV)-410-FM1

Project Name:	PFAS Only	Project Number:	60612487		
Project Location:	LAVARACK	Client:	DEFENCE		
PM Name:	[REDACTED]	Fieldwork Staff Name:	[REDACTED]		
This calibration record is intended to prompt fieldwork staff to calibrate water quality meter (WQM) daily before the start of fieldworks.					
INSTRUMENT DETAILS					
Supplier:	AIRMET				
Make and Model:	YSI PRO PLUS				
Serial Number:	18.1104323				
CALIBRATION					
CALIBRATE WITH CALIBRATION SOLUTIONS					
Date and Time:	20/8/21 0900				
Parameter	Acidity		Conductivity	ORP	Disolved Oxygen
Units	pH	pH	µS/cm	mV	ppm %
Calibration Standard Concentration:	7.02	4.00	2444	238.4	100.2
Calibration Reading:	7.11	3.99	2724	233.8	101.5
Calibration Temperature:	19.5	19.3	19.4	19.3	19.9
ONGOING CHECKS					
BUMP TEST WITH CALIBRATION SOLUTION					
Date and Time:					
Parameter	Acidity		Conductivity	Disolved Oxygen	
Units	pH	pH	µS/cm	ppm	ppm
Calibration Standard Concentration:					
Bump Test Reading:					
Bump Test Temperature:					
COMMENTS					
Detail any equipment faults, minor maintenance performed, change of batteries or technical support provided.					
Approval and Distribution					
<input type="checkbox"/> Each individual in [REDACTED] daily and bump tested as required by fieldwork staff.					
_____ Fieldwork Staff Signature			_____ Date		
Distribution: Project Central File					

Appendix F

Laboratory Reports



CERTIFICATE OF ANALYSIS

Work Order : ET2103890
Client : AECOM Australia Pty Ltd
Contact : [Redacted]
Address : BRISBANE
Telephone : ----
Project : QLD_0229_PFASOMP_20
Order number : 60612487_3.1
C-O-C number : 26431
Sampler : [Redacted]
Site : QLD_0229
Quote number : TV/007/21 - Compass
No. of samples received : 106
No. of samples analysed : 106

Page : 1 of 47
Laboratory : Environmental Division Townsville
Contact : [Redacted]
Address : 13 Carlton Street, Kirwan Townsville QLD Australia 4815
Telephone : +61 7 3552 8616
Date Samples Received : 24-Aug-2021 08:25
Date Analysis Commenced : 26-Aug-2021
Issue Date : 02-Sep-2021 10:05



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.

Table with 3 columns: Signatories, Position, Accreditation Category. Includes roles like Senior Acid Sulfate Soil Chemist and Senior Organic Chemist.



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 Contact 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 PFAS: Sample '0229_SD139_210816' was diluted due to matrix interference. LOR adjusted accordingly.
- EP231X - Per- and Polyfluoroalkyl Substances (PFAS): Samples received in 20ml or 125ml bottles have been tested in accordance with the QSM5.3 compliant, NATA accredited method. 60mL or 250mL bottles have been tested to the legacy QSM 5.1 aligned, NATA accredited method.
- EP231X PFAS: Particular samples required dilution due to the presence of high level contaminants. LOR values have been adjusted accordingly. Surrogate recovery was not determined on sample '0229_MW128_210818'.
- EP231X PFAS: Particular samples required dilution prior to extraction due to matrix interferences. LOR values have been adjusted accordingly.
- 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.
- 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	0229_SD205_210819	0229_SD217_210819	0229_SD203_210819	----	----
Sampling date / time				19-Aug-2021 08:15	19-Aug-2021 10:40	19-Aug-2021 11:16	----	----	
Compound	CAS Number	LOR	Unit	ET2103890-093	ET2103890-094	ET2103890-098	-----	-----	
				Result	Result	Result	----	----	
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content	----	0.1	%	31.6	37.2	14.7	----	----	
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	0.0017	0.0004	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	----	----	
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	----	----	



Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)				Sample ID	0229_SD205_210819	0229_SD217_210819	0229_SD203_210819	----	----
Sampling date / time				19-Aug-2021 08:15	19-Aug-2021 10:40	19-Aug-2021 11:16	----	----	
Compound	CAS Number	LOR	Unit	ET2103890-093	ET2103890-094	ET2103890-098	-----	-----	
				Result	Result	Result	----	----	
EP231C: Perfluoroalkyl Sulfonamides - Continued									
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	0.0021	0.0004	0.0003	----	----	
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg	0.0019	0.0004	0.0003	----	----	
Sum of PFAS (WA DER List)	----	0.0002	mg/kg	0.0021	0.0004	0.0003	----	----	
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.0002	%	109	93.0	104	----	----	
13C8-PFOA	----	0.0002	%	108	108	108	----	----	



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	0229_SD144_210816	0229_SD110_210816	0229_SD109_210816	0229_SD139_210816	0229_QC101_210816
Sampling date / time				16-Aug-2021 11:27	16-Aug-2021 11:49	16-Aug-2021 11:58	16-Aug-2021 12:35	16-Aug-2021 13:06	
Compound	CAS Number	LOR	Unit	ET2103890-003	ET2103890-004	ET2103890-005	ET2103890-007	ET2103890-008	
				Result	Result	Result	Result	Result	
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content	----	0.1	%	33.7	35.2	37.5	69.7	39.3	
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	0.0013	0.0004	<0.0010	0.0002	
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	0.0012	0.0005	<0.0010	0.0003	
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	0.0002	0.0091	0.0054	0.0044	0.0036	
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	0.0010	0.0009	<0.0010	0.0006	
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	0.0058	0.0542	0.122	0.0468	0.0330	
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	0.0005	0.0018	<0.0010	0.0004	
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	<0.001	<0.001	<0.005	<0.001	
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	0.0005	0.0006	<0.0010	<0.0002	
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	0.0021	0.0014	<0.0010	0.0004	
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	0.0003	0.0005	<0.0010	<0.0002	
Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	0.0008	0.0008	<0.0010	0.0002	
Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	<0.0002	0.0003	<0.0010	<0.0002	
Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0010	<0.0002	
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	0.0002	0.0005	<0.0010	<0.0002	
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	<0.0002	0.0004	<0.0010	<0.0002	
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0007	<0.0010	<0.0002	
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	<0.0005	<0.0006	<0.0025	<0.0005	
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	0.0003	0.0031	<0.0010	<0.0002	
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	<0.0005	<0.0006	<0.0025	<0.0005	



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	0229_SD144_210816	0229_SD110_210816	0229_SD109_210816	0229_SD139_210816	0229_QC101_210816
Sampling date / time				16-Aug-2021 11:27	16-Aug-2021 11:49	16-Aug-2021 11:58	16-Aug-2021 12:35	16-Aug-2021 13:06	
Compound	CAS Number	LOR	Unit	ET2103890-003	ET2103890-004	ET2103890-005	ET2103890-007	ET2103890-008	
				Result	Result	Result	Result	Result	
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	<0.0005	<0.0006	<0.0025	<0.0005	
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	<0.0005	<0.0006	<0.0025	<0.0005	
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	<0.0005	<0.0006	<0.0025	<0.0005	
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0010	<0.0002	
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0010	<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	<0.0010	<0.0005	
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	<0.0010	<0.0005	
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	<0.0010	<0.0005	
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	<0.0010	<0.0005	
EP231P: PFAS Sums									
Sum of PFAS	----	0.0002	mg/kg	0.0060	0.0715	0.139	0.0512	0.0387	
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg	0.0060	0.0633	0.127	0.0512	0.0366	
Sum of PFAS (WA DER List)	----	0.0002	mg/kg	0.0060	0.0683	0.131	0.0512	0.0374	
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.0002	%	115	102	118	105	107	
13C8-PFOA	----	0.0002	%	108	108	97.5	100	113	



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	0229_SD140_210816	0229_SD243_210816	0229_SD242_210816	0229_SD136_210816	0229_SD121_210816
Sampling date / time				16-Aug-2021 13:07	16-Aug-2021 14:15	16-Aug-2021 14:43	16-Aug-2021 15:17	16-Aug-2021 15:36	
Compound	CAS Number	LOR	Unit	ET2103890-009	ET2103890-013	ET2103890-014	ET2103890-016	ET2103890-018	
				Result	Result	Result	Result	Result	
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content	----	0.1	%	35.2	35.6	43.1	2.4	22.1	
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	0.0002	<0.0002	<0.0002	<0.0002	0.0007	
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	0.0002	<0.0002	<0.0002	<0.0002	0.0012	
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	0.0027	<0.0002	<0.0002	0.0015	0.0097	
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	0.0004	<0.0002	<0.0002	<0.0002	0.0004	
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	0.0222	0.0003	0.0023	0.0107	0.0097	
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	0.0004	<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	0.0003	
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	0.0004	<0.0002	<0.0002	0.0005	0.0018	
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	0.0006	
Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	0.0003	
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	
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	0229_SD140_210816	0229_SD243_210816	0229_SD242_210816	0229_SD136_210816	0229_SD121_210816
Sampling date / time				16-Aug-2021 13:07	16-Aug-2021 14:15	16-Aug-2021 14:43	16-Aug-2021 15:17	16-Aug-2021 15:36	
Compound	CAS Number	LOR	Unit	ET2103890-009	ET2103890-013	ET2103890-014	ET2103890-016	ET2103890-018	
				Result	Result	Result	Result	Result	
EP231C: Perfluoroalkyl Sulfonamides - Continued									
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	0.0267	0.0003	0.0023	0.0129	0.0249	
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg	0.0249	0.0003	0.0023	0.0122	0.0194	
Sum of PFAS (WA DER List)	----	0.0002	mg/kg	0.0257	0.0003	0.0023	0.0129	0.0230	
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.0002	%	120	102	104	104	110	
13C8-PFOA	----	0.0002	%	112	106	120	118	118	



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	0229_SD133_210816	0229_SD233_210816	0229_SD220_210816	0229_SD232_210816	0229_SD113_210818
Sampling date / time				16-Aug-2021 16:00	16-Aug-2021 17:02	16-Aug-2021 15:45	16-Aug-2021 15:20	18-Aug-2021 13:33	
Compound	CAS Number	LOR	Unit	ET2103890-019	ET2103890-021	ET2103890-022	ET2103890-025	ET2103890-049	
				Result	Result	Result	Result	Result	
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content	----	0.1	%	2.6	36.5	72.8	44.3	1.2	
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	<0.0002	0.0011	<0.0002	<0.0002	
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	<0.0002	0.0007	<0.0002	<0.0002	
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	0.0011	0.0074	<0.0002	<0.0002	
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	<0.0002	0.0008	<0.0002	<0.0002	
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	0.0007	0.0104	0.0336	0.0018	0.0011	
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	0.0009	<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	0.0003	<0.0002	<0.0002	
Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	<0.0002	0.0006	<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	0.0003	<0.0002	<0.0002	
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	<0.0002	0.0004	<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	
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	0229_SD133_210816	0229_SD233_210816	0229_SD220_210816	0229_SD232_210816	0229_SD113_210818
Sampling date / time				16-Aug-2021 16:00	16-Aug-2021 17:02	16-Aug-2021 15:45	16-Aug-2021 15:20	18-Aug-2021 13:33	
Compound	CAS Number	LOR	Unit	ET2103890-019	ET2103890-021	ET2103890-022	ET2103890-025	ET2103890-049	
				Result	Result	Result	Result	Result	
EP231C: Perfluoroalkyl Sulfonamides - Continued									
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	0.0007	0.0115	0.0465	0.0018	0.0011	
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg	0.0007	0.0115	0.0410	0.0018	0.0011	
Sum of PFAS (WA DER List)	----	0.0002	mg/kg	0.0007	0.0115	0.0435	0.0018	0.0011	
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.0002	%	110	124	104	119	129	
13C8-PFOA	----	0.0002	%	114	118	106	116	110	



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	0229_SD119_210818	0229_QC107_210818	0229_SD120_210818	0229_SD135_210818	0229_SD134_210818
Sampling date / time				18-Aug-2021 14:20	18-Aug-2021 14:47	18-Aug-2021 14:47	18-Aug-2021 14:47	18-Aug-2021 15:03	18-Aug-2021 15:41
Compound	CAS Number	LOR	Unit	ET2103890-052	ET2103890-055	ET2103890-056	ET2103890-058	ET2103890-062	
				Result	Result	Result	Result	Result	
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	<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	<0.0005
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	<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	<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	<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	<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	<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	<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	<0.0005
EP231P: PFAS Sums									
Sum of PFAS	----	0.0002	mg/kg	0.0514	0.0038	0.0037	0.0009	0.0004	
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg	0.0365	0.0038	0.0037	0.0009	0.0004	
Sum of PFAS (WA DER List)	----	0.0002	mg/kg	0.0481	0.0038	0.0037	0.0009	0.0004	
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.0002	%	117	108	102	109	114	
13C8-PFOA	----	0.0002	%	118	108	110	113	112	



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	0229_SD130_210818	0229_SD129_210818	0229_SD128_210818	0229_SD126_210818	0229_SD244_210818
Sampling date / time				18-Aug-2021 16:03	18-Aug-2021 16:14	18-Aug-2021 16:22	18-Aug-2021 16:32	18-Aug-2021 10:00	
Compound	CAS Number	LOR	Unit	ET2103890-069	ET2103890-076	ET2103890-077	ET2103890-078	ET2103890-080	
				Result	Result	Result	Result	Result	
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content	----	0.1	%	0.3	0.4	4.0	0.5	20.3	
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	<0.0002	0.0004	<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	0.0007	<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	0.0011	0.0007	0.0034	<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	
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	0229_SD130_210818	0229_SD129_210818	0229_SD128_210818	0229_SD126_210818	0229_SD244_210818
Sampling date / time				18-Aug-2021 16:03	18-Aug-2021 16:14	18-Aug-2021 16:22	18-Aug-2021 16:32	18-Aug-2021 10:00	
Compound	CAS Number	LOR	Unit	ET2103890-069	ET2103890-076	ET2103890-077	ET2103890-078	ET2103890-080	
				Result	Result	Result	Result	Result	
EP231C: Perfluoroalkyl Sulfonamides - Continued									
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	0.0011	0.0007	0.0045	<0.0002	<0.0002	
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg	0.0011	0.0007	0.0041	<0.0002	<0.0002	
Sum of PFAS (WA DER List)	----	0.0002	mg/kg	0.0011	0.0007	0.0045	<0.0002	<0.0002	
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.0002	%	116	114	118	106	98.5	
13C8-PFOA	----	0.0002	%	108	110	110	112	107	



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	0229_QC102_210818	0229_SD245_210818	0229_SD227_210818	----	----
Sampling date / time				18-Aug-2021 10:00	18-Aug-2021 08:20	18-Aug-2021 11:05	----	----	
Compound	CAS Number	LOR	Unit	ET2103890-081	ET2103890-083	ET2103890-086	-----	-----	
				Result	Result	Result	----	----	
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content	----	0.1	%	18.4	41.4	45.1	----	----	
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	----	----	
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	----	----	



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	0229_QC102_210818	0229_SD245_210818	0229_SD227_210818	----	----
Sampling date / time				18-Aug-2021 10:00	18-Aug-2021 08:20	18-Aug-2021 11:05	----	----	
Compound	CAS Number	LOR	Unit	ET2103890-081	ET2103890-083	ET2103890-086	-----	-----	
				Result	Result	Result	----	----	
EP231C: Perfluoroalkyl Sulfonamides - Continued									
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	%	81.5	115	98.0	----	----	
13C8-PFOA	----	0.0002	%	106	114	106	----	----	



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	0229_QC500_210816	0229_SW144_210816	0229_SW139_210816	0229_QC100_210816	0229_SW140_210816
Sampling date / time				16-Aug-2021 11:12	16-Aug-2021 11:27	16-Aug-2021 12:34	16-Aug-2021 13:08	16-Aug-2021 13:08	16-Aug-2021 13:08
Compound	CAS Number	LOR	Unit	ET2103890-001	ET2103890-002	ET2103890-006	ET2103890-010	ET2103890-011	ET2103890-011
				Result	Result	Result	Result	Result	Result
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	<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	<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	<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	<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	<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	<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	<0.05
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L	<0.01	0.21	4.05	3.73	3.61	3.61
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	<0.01	0.18	3.06	2.76	2.69	2.69
Sum of PFAS (WA DER List)	----	0.01	µg/L	<0.01	0.21	3.80	3.50	3.39	3.39
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%	109	97.1	111	94.1	93.4	93.4
13C8-PFOA	----	0.02	%	103	103	101	102	95.5	95.5



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	0229_SW243_210816	0229_SW242_210816	0229_SW121_210816	0229_SW233_210816	0229_SW220_210816
Sampling date / time				16-Aug-2021 14:14	16-Aug-2021 14:44	16-Aug-2021 15:35	16-Aug-2021 17:01	16-Aug-2021 15:45	
Compound	CAS Number	LOR	Unit	ET2103890-012	ET2103890-015	ET2103890-017	ET2103890-020	ET2103890-023	
				Result	Result	Result	Result	Result	
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	<0.02	0.71	0.11	0.19	
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	<0.02	0.76	0.08	0.13	
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.02	µg/L	<0.02	0.02	5.52	0.57	1.23	
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	<0.02	0.13	0.03	0.04	
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.02	1.14	0.61	0.54	
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	0.2	<0.1	<0.1	
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	<0.02	0.21	0.02	0.03	
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	<0.02	1.58	0.16	0.24	
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	<0.02	0.13	0.02	0.02	
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	<0.01	0.22	0.05	0.04	
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	<0.02	0.06	<0.02	<0.02	
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02	
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02	
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02	
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02	
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05	
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02	
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05	
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05	



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	0229_SW243_210816	0229_SW242_210816	0229_SW121_210816	0229_SW233_210816	0229_SW220_210816
Sampling date / time				16-Aug-2021 14:14	16-Aug-2021 14:44	16-Aug-2021 15:35	16-Aug-2021 17:01	16-Aug-2021 15:45	
Compound	CAS Number	LOR	Unit	ET2103890-012	ET2103890-015	ET2103890-017	ET2103890-020	ET2103890-023	
				Result	Result	Result	Result	Result	
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05	
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05	
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02	
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02	
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05	
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05	
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05	
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05	
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L	<0.01	0.04	10.7	1.65	2.46	
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	<0.01	0.04	6.66	1.18	1.77	
Sum of PFAS (WA DER List)	----	0.01	µg/L	<0.01	0.04	9.71	1.54	2.29	
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%	101	99.2	97.1	96.1	95.9	
13C8-PFOA	----	0.02	%	99.3	100	98.5	101	101	



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	0229_SW232_210816	0229_QC300_210816	0229_QC301_210816	0229_MW119_210817	0229_MW125I_210817
				Sampling date / time	16-Aug-2021 15:20	16-Aug-2021 18:10	16-Aug-2021 18:11	17-Aug-2021 09:10	17-Aug-2021 11:04
Compound	CAS Number	LOR	Unit	ET2103890-024	ET2103890-026	ET2103890-027	ET2103890-028	ET2103890-029	ET2103890-029
				Result	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	0.23	0.04	
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	0.03	
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.02	µg/L	<0.02	<0.02	<0.02	0.05	0.19	
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	0.03	
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02	
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	<0.1	<0.1	0.1	<0.1	
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	<0.02	<0.02	0.22	<0.02	
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	<0.02	<0.02	0.23	0.05	
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	<0.02	<0.02	0.15	<0.02	
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	<0.01	<0.01	0.10	<0.01	
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02	
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02	
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02	
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02	
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02	
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05	
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02	
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05	
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05	



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	0229_SW232_210816	0229_QC300_210816	0229_QC301_210816	0229_MW119_210817	0229_MW125I_210817
									7
Sampling date / time				16-Aug-2021 15:20	16-Aug-2021 18:10	16-Aug-2021 18:11	17-Aug-2021 09:10	17-Aug-2021 11:04	
Compound	CAS Number	LOR	Unit	ET2103890-024	ET2103890-026	ET2103890-027	ET2103890-028	ET2103890-029	
				Result	Result	Result	Result	Result	
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	<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	<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	<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	<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	<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	<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	<0.05
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L	0.01	<0.01	<0.01	1.08	0.34	
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	0.01	<0.01	<0.01	0.05	0.22	
Sum of PFAS (WA DER List)	----	0.01	µg/L	0.01	<0.01	<0.01	1.08	0.31	
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%	96.2	111	103	105	110	
13C8-PFOA	----	0.02	%	108	108	108	113	112	



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	0229_MW125S_21081 7	0229_MW124_210817	0229_MW116_210818	0229_MW141_210817	0229_MW115_210818
Sampling date / time					17-Aug-2021 11:19	17-Aug-2021 11:50	18-Aug-2021 08:43	17-Aug-2021 13:29	18-Aug-2021 09:00
Compound	CAS Number	LOR	Unit	ET2103890-030	ET2103890-031	ET2103890-032	ET2103890-033	ET2103890-034	ET2103890-034
				Result	Result	Result	Result	Result	Result
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	0.27	<0.02	0.11	0.13	0.19	
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	0.19	<0.02	0.05	0.10	0.07	
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.02	µg/L	0.96	<0.02	0.12	0.78	0.27	
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	<0.02	<0.02	0.03	<0.02	
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	<0.01	0.01	0.37	0.34	
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	0.09	<0.02	0.02	0.05	0.02	
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	0.43	<0.02	0.05	0.23	0.13	
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	0.04	<0.01	
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02	
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02	
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02	
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02	
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02	
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05	
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02	
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05	
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05	



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	0229_MW125S_21081 7	0229_MW124_210817	0229_MW116_210818	0229_MW141_210817	0229_MW115_210818
Sampling date / time					17-Aug-2021 11:19	17-Aug-2021 11:50	18-Aug-2021 08:43	17-Aug-2021 13:29	18-Aug-2021 09:00
Compound	CAS Number	LOR	Unit		ET2103890-030	ET2103890-031	ET2103890-032	ET2103890-033	ET2103890-034
					Result	Result	Result	Result	Result
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	<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	<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	<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	<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	<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	<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	<0.05
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L	1.97	<0.01	0.36	1.73	1.02	
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	0.96	<0.01	0.13	1.15	0.61	
Sum of PFAS (WA DER List)	----	0.01	µg/L	1.78	<0.01	0.31	1.60	0.95	
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%	102	110	121	98.7	102	
13C8-PFOA	----	0.02	%	104	107	109	103	99.0	



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	0229_MW117S_21081 7	0229_MW117D_21081 7	0229_QC302_210817	0229_MW135_210818	0229_MW018_210818
Sampling date / time					17-Aug-2021 15:34	17-Aug-2021 15:47	17-Aug-2021 17:20	18-Aug-2021 09:41	18-Aug-2021 10:08
Compound	CAS Number	LOR	Unit	ET2103890-035	ET2103890-036	ET2103890-037	ET2103890-038	ET2103890-039	ET2103890-039
				Result	Result	Result	Result	Result	Result
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	1.20	<0.02	<0.02	0.14	0.44	0.44
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	1.37	<0.02	<0.02	0.14	0.46	0.46
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.02	µg/L	15.3	<0.02	<0.02	1.70	2.66	2.66
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	0.66	<0.02	<0.02	0.11	0.16	0.16
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	7.47	<0.01	<0.01	2.41	4.69	4.69
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.05	<0.02	<0.02	<0.02	<0.02	<0.02
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	0.39	<0.02	<0.02	<0.02	0.15	0.15
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	3.41	<0.02	<0.02	0.15	0.90	0.90
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	0.30	<0.02	<0.02	0.02	0.11	0.11
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	0.50	<0.01	<0.01	0.07	0.19	0.19
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.05	<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.05	<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.05	<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.05	<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.05	<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.12	<0.05	<0.05	<0.05	<0.05	<0.05
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.05	<0.02	<0.02	<0.02	<0.02	<0.02
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.12	<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.12	<0.05	<0.05	<0.05	<0.05	<0.05



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	0229_MW117S_21081 7	0229_MW117D_21081 7	0229_QC302_210817	0229_MW135_210818	0229_MW018_210818
Sampling date / time					17-Aug-2021 15:34	17-Aug-2021 15:47	17-Aug-2021 17:20	18-Aug-2021 09:41	18-Aug-2021 10:08
Compound	CAS Number	LOR	Unit		ET2103890-035	ET2103890-036	ET2103890-037	ET2103890-038	ET2103890-039
					Result	Result	Result	Result	Result
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.12	<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.12	<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.05	<0.02	<0.02	<0.02	<0.02	<0.02
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.05	<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	<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	<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	<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	<0.05
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L	30.6	<0.01	<0.01	<0.01	4.74	9.76
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	22.8	<0.01	<0.01	<0.01	4.11	7.35
Sum of PFAS (WA DER List)	----	0.01	µg/L	28.6	<0.01	<0.01	<0.01	4.49	9.14
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%	113	97.5	104	97.0	107	107
13C8-PFOA	----	0.02	%	99.3	102	109	99.3	97.4	97.4



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	0229_QC104_210818	0229_MW114_210818	0229_MW128_210818	0229_MW105_210818	0229_QC105_210818
Sampling date / time					18-Aug-2021 10:09	18-Aug-2021 10:32	18-Aug-2021 10:58	18-Aug-2021 11:56	18-Aug-2021 11:56
Compound	CAS Number	LOR	Unit	ET2103890-040	ET2103890-041	ET2103890-042	ET2103890-043	ET2103890-044	ET2103890-044
				Result	Result	Result	Result	Result	Result
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	0.38	0.50	28.9	4.13	4.22	
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	0.42	0.56	32.8	4.84	4.84	
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.02	µg/L	2.31	2.57	306	33.4	35.4	
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	0.15	0.10	21.2	1.50	1.62	
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	3.40	0.21	461	27.3	26.4	
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	<0.02	<0.81	<0.04	<0.04	
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	0.2	6.0	0.7	0.7	
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	0.14	0.22	15.6	1.62	1.59	
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	0.79	1.18	80.1	9.94	10.3	
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	0.09	0.17	8.22	0.96	0.92	
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	0.16	0.20	19.4	1.62	1.65	
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	<0.02	20.8	0.14	0.12	
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	<0.02	<0.81	<0.04	<0.04	
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	<0.02	<0.81	<0.04	<0.04	
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	<0.02	<0.81	<0.04	<0.04	
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	<0.02	<0.81	<0.04	<0.04	
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	<0.05	<2.02	<0.09	<0.09	
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	<0.02	<0.81	<0.04	<0.04	
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	<0.05	<2.02	<0.09	<0.09	
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	<0.05	<2.02	<0.09	<0.09	



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	0229_QC104_210818	0229_MW114_210818	0229_MW128_210818	0229_MW105_210818	0229_QC105_210818
Sampling date / time					18-Aug-2021 10:09	18-Aug-2021 10:32	18-Aug-2021 10:58	18-Aug-2021 11:56	18-Aug-2021 11:56
Compound	CAS Number	LOR	Unit	ET2103890-040	ET2103890-041	ET2103890-042	ET2103890-043	ET2103890-044	
				Result	Result	Result	Result	Result	
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	<0.05	<2.02	<0.09	<0.09	
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	<0.05	<2.02	<0.09	<0.09	
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	<0.02	<0.81	<0.04	<0.04	
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	<0.02	<0.81	<0.04	<0.04	
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	<0.81	<0.05	<0.05	
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	<0.05	<0.81	0.24	0.20	
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	<0.05	<0.81	<0.05	<0.05	
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	<0.05	<0.81	<0.05	<0.05	
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L	7.84	5.91	1000	86.4	88.0	
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	5.71	2.78	767	60.7	61.8	
Sum of PFAS (WA DER List)	----	0.01	µg/L	7.27	5.25	925	79.9	81.4	
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%	110	116	Not Determined	92.0	89.0	
13C8-PFOA	----	0.02	%	109	103	Not Determined	91.0	94.0	



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	0229_MW101_210818	0229_QC106_210818	0229_MW102_210818	0229_MW106_210818	0229_MW118_210817
Sampling date / time				18-Aug-2021 12:24	18-Aug-2021 12:24	18-Aug-2021 13:26	18-Aug-2021 13:26	17-Aug-2021 15:20	
Compound	CAS Number	LOR	Unit	ET2103890-045	ET2103890-046	ET2103890-047	ET2103890-048	ET2103890-050	
				Result	Result	Result	Result	Result	
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	0.26	0.31	0.60	0.06	0.06	
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	0.10	0.10	0.51	0.03	<0.02	
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.02	µg/L	0.60	0.58	2.96	0.25	0.04	
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	0.03	0.02	0.19	<0.02	<0.02	
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	0.67	0.78	1.39	0.10	<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	0.14	<0.02	<0.02	
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	0.09	0.09	0.52	0.04	<0.02	
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	<0.02	0.11	<0.02	<0.02	
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	0.03	0.03	0.20	<0.01	<0.01	
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02	
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02	
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02	
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02	
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02	
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05	
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02	
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05	
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05	



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	0229_MW101_210818	0229_QC106_210818	0229_MW102_210818	0229_MW106_210818	0229_MW118_210817
Sampling date / time				18-Aug-2021 12:24	18-Aug-2021 12:24	18-Aug-2021 13:26	18-Aug-2021 13:26	17-Aug-2021 15:20	
Compound	CAS Number	LOR	Unit	ET2103890-045	ET2103890-046	ET2103890-047	ET2103890-048	ET2103890-050	
				Result	Result	Result	Result	Result	
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05	
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05	
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02	
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02	
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05	
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05	
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05	
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05	
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L	1.78	1.91	6.72	0.48	0.10	
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	1.27	1.36	4.35	0.35	0.04	
Sum of PFAS (WA DER List)	----	0.01	µg/L	1.65	1.79	6.02	0.45	0.10	
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%	91.0	107	90.5	95.4	108	
13C8-PFOA	----	0.02	%	97.5	100	95.2	97.4	93.6	



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	0229_MW138_210818	0229_SW119_210818	0229_MW220S_21081 8	0229_SW135_210818	0229_MW233_210818
Sampling date / time				18-Aug-2021 14:02	18-Aug-2021 14:20	18-Aug-2021 14:36	18-Aug-2021 15:02	18-Aug-2021 15:07	
Compound	CAS Number	LOR	Unit	ET2103890-051	ET2103890-053	ET2103890-054	ET2103890-057	ET2103890-059	
				Result	Result	Result	Result	Result	
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	0.94	0.26	0.16	0.02	<0.02	
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	0.96	0.21	0.12	<0.02	<0.02	
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.02	µg/L	6.01	1.08	0.50	0.09	<0.02	
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	0.39	0.03	<0.02	<0.02	<0.02	
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	6.91	0.41	0.02	0.19	<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	0.2	<0.1	<0.1	<0.1	<0.1	
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	0.26	0.07	<0.02	<0.02	<0.02	
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	1.50	0.38	0.02	<0.02	<0.02	
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	0.20	0.04	<0.02	<0.02	<0.02	
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	0.40	0.04	<0.01	<0.01	<0.01	
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	0.04	<0.02	<0.02	<0.02	<0.02	
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02	
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02	
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02	
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02	
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05	
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02	
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05	
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05	



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	0229_MW138_210818	0229_SW119_210818	0229_MW220S_210818 8	0229_SW135_210818	0229_MW233_210818
Sampling date / time				18-Aug-2021 14:02	18-Aug-2021 14:20	18-Aug-2021 14:36	18-Aug-2021 15:02	18-Aug-2021 15:07	
Compound	CAS Number	LOR	Unit	ET2103890-051	ET2103890-053	ET2103890-054	ET2103890-057	ET2103890-059	
				Result	Result	Result	Result	Result	
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05	
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05	
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02	
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02	
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05	
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05	
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05	
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05	
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L	17.8	2.52	0.82	0.30	<0.01	
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	12.9	1.49	0.52	0.28	<0.01	
Sum of PFAS (WA DER List)	----	0.01	µg/L	16.4	2.28	0.70	0.30	<0.01	
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%	81.5	111	110	100	109	
13C8-PFOA	----	0.02	%	95.5	108	105	106	107	



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	0229_MW212_210818	0229_SW134_210818	0229_QC305_210818	0229_MW122_210818	0229_MW217_210818
Sampling date / time				18-Aug-2021 15:33	18-Aug-2021 15:40	18-Aug-2021 15:57	18-Aug-2021 12:10	18-Aug-2021 15:20	
Compound	CAS Number	LOR	Unit	ET2103890-060	ET2103890-061	ET2103890-063	ET2103890-064	ET2103890-065	
				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	0.10	<0.10	
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	<0.02	<0.02	0.06	<0.10	
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.02	µg/L	<0.02	<0.02	<0.02	0.39	<0.10	
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	<0.02	<0.02	0.03	<0.10	
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	<0.01	<0.01	0.85	<0.10	
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.10	
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	<0.1	<0.1	<0.1	<0.5	
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.10	
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	<0.02	<0.02	0.05	<0.10	
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.10	
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	<0.01	<0.01	0.03	<0.10	
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.10	
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.10	
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.10	
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.10	
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.10	
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.25	
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.10	
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.25	
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.25	



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	0229_MW212_210818	0229_SW134_210818	0229_QC305_210818	0229_MW122_210818	0229_MW217_210818
Sampling date / time				18-Aug-2021 15:33	18-Aug-2021 15:40	18-Aug-2021 15:57	18-Aug-2021 12:10	18-Aug-2021 15:20	
Compound	CAS Number	LOR	Unit	ET2103890-060	ET2103890-061	ET2103890-063	ET2103890-064	ET2103890-065	
				Result	Result	Result	Result	Result	
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.25	
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.25	
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.10	
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.10	
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	<0.10	
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.10	
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.10	
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.10	
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L	<0.01	<0.01	<0.01	1.51	<0.10	
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	<0.01	<0.01	<0.01	1.24	<0.10	
Sum of PFAS (WA DER List)	----	0.01	µg/L	<0.01	<0.01	<0.01	1.42	<0.10	
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%	113	106	123	110	102	
13C8-PFOA	----	0.02	%	106	105	110	106	107	



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	0229_MW065_210818	0229_MW123I_21081 8	0229_MW123S_21081 8	0229_MW121_210818	0229_MW235S_21081 8
Sampling date / time				18-Aug-2021 10:35	18-Aug-2021 09:40	18-Aug-2021 10:15	18-Aug-2021 13:10	18-Aug-2021 15:50	
Compound	CAS Number	LOR	Unit	ET2103890-066	ET2103890-067	ET2103890-068	ET2103890-070	ET2103890-071	
				Result	Result	Result	Result	Result	
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	0.42	0.20	0.75	0.04	0.03	
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	0.52	0.18	0.78	0.04	<0.02	
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.02	µg/L	7.37	0.51	7.98	0.28	0.03	
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	0.35	<0.02	1.10	<0.02	<0.02	
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	8.78	<0.01	3.24	0.06	0.12	
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.05	<0.02	<0.02	<0.02	<0.02	
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.2	<0.1	0.2	<0.1	<0.1	
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	0.24	<0.02	0.20	<0.02	<0.02	
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	1.60	0.09	1.05	<0.02	<0.02	
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	0.13	<0.02	0.16	<0.02	<0.02	
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	0.24	<0.01	0.52	<0.01	<0.02	
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.05	<0.02	<0.02	<0.02	<0.02	
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.05	<0.02	<0.02	<0.02	<0.02	
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.05	<0.02	<0.02	<0.02	<0.02	
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.05	<0.02	<0.02	<0.02	<0.02	
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.05	<0.02	<0.02	<0.02	<0.02	
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.12	<0.05	<0.05	<0.05	<0.06	
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.05	<0.02	<0.02	<0.02	<0.02	
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.12	<0.05	<0.05	<0.05	<0.06	
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.12	<0.05	<0.05	<0.05	<0.06	



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	0229_MW065_210818	0229_MW123I_21081 8	0229_MW123S_21081 8	0229_MW121_210818	0229_MW235S_21081 8
Sampling date / time				18-Aug-2021 10:35	18-Aug-2021 09:40	18-Aug-2021 10:15	18-Aug-2021 13:10	18-Aug-2021 15:50	
Compound	CAS Number	LOR	Unit	ET2103890-066	ET2103890-067	ET2103890-068	ET2103890-070	ET2103890-071	
				Result	Result	Result	Result	Result	
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.12	<0.05	<0.05	<0.05	<0.05	<0.06
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.12	<0.05	<0.05	<0.05	<0.05	<0.06
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.05	<0.02	<0.02	<0.02	<0.02	<0.02
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.05	<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	<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	<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	<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	<0.05
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L	19.6	0.98	16.0	0.42	0.18	
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	16.2	0.51	11.2	0.34	0.15	
Sum of PFAS (WA DER List)	----	0.01	µg/L	18.8	0.80	14.1	0.38	0.18	
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%	122	114	106	106	113	
13C8-PFOA	----	0.02	%	105	105	108	107	103	



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	0229_MW139_210818	0229_MW120_210818	0229_MW003_210818	0229_QC306_210818	0229_SW244_210818
Sampling date / time				18-Aug-2021 14:20	18-Aug-2021 13:45	18-Aug-2021 11:20	18-Aug-2021 16:00	18-Aug-2021 10:12	
Compound	CAS Number	LOR	Unit	ET2103890-072	ET2103890-073	ET2103890-074	ET2103890-075	ET2103890-079	
				Result	Result	Result	Result	Result	
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	0.11	0.10	<0.02	<0.02	<0.02	
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	0.15	<0.02	<0.02	<0.02	<0.02	
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.02	µg/L	1.34	0.09	<0.02	<0.02	<0.02	
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	0.07	<0.02	<0.02	<0.02	<0.02	
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	2.13	0.12	<0.01	<0.01	<0.01	
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<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	0.12	<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	0.04	<0.01	<0.01	<0.01	<0.01	
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02	
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02	
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02	
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02	
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02	
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05	
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02	
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05	
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05	



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	0229_MW139_210818	0229_MW120_210818	0229_MW003_210818	0229_QC306_210818	0229_SW244_210818
Sampling date / time					18-Aug-2021 14:20	18-Aug-2021 13:45	18-Aug-2021 11:20	18-Aug-2021 16:00	18-Aug-2021 10:12
Compound	CAS Number	LOR	Unit	ET2103890-072	ET2103890-073	ET2103890-074	ET2103890-075	ET2103890-079	
				Result	Result	Result	Result	Result	
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05	
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05	
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02	
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02	
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05	
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05	
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05	
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05	
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L	3.98	0.31	<0.01	<0.01	<0.01	
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	3.47	0.21	<0.01	<0.01	<0.01	
Sum of PFAS (WA DER List)	----	0.01	µg/L	3.76	0.31	<0.01	<0.01	<0.01	
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%	105	115	122	112	116	
13C8-PFOA	----	0.02	%	109	104	105	108	111	



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	0229_SW245_210818	0229_QC103_210818	0229_SW227_210818	0229_QC307_210818	0229_MW236S_210819
Sampling date / time					18-Aug-2021 08:20	18-Aug-2021 10:00	18-Aug-2021 11:05	18-Aug-2021 17:40	19-Aug-2021 08:54
Compound	CAS Number	LOR	Unit	ET2103890-082	ET2103890-084	ET2103890-085	ET2103890-087	ET2103890-088	ET2103890-088
				Result	Result	Result	Result	Result	Result
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05	<0.11
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05	<0.11
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02	<0.04
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02	<0.04
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	<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	<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	<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	<0.05
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L	<0.01	<0.01	<0.01	<0.01	<0.01	0.36
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	0.31
Sum of PFAS (WA DER List)	----	0.01	µg/L	<0.01	<0.01	<0.01	<0.01	<0.01	0.36
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%	105	107	107	112	103	103
13C8-PFOA	----	0.02	%	114	108	109	109	109	104



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	0229_MW131_210819	0229_QC108_210819	0229_MW074_210819	0229_MW002_210819	0229_MW205S_210819 9
Sampling date / time					19-Aug-2021 09:30	19-Aug-2021 09:31	19-Aug-2021 10:01	19-Aug-2021 10:30	19-Aug-2021 08:35
Compound	CAS Number	LOR	Unit	ET2103890-089	ET2103890-090	ET2103890-091	ET2103890-092	ET2103890-095	ET2103890-095
				Result	Result	Result	Result	Result	Result
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	0.54	0.54	6.31	0.11	<0.02	<0.02
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	0.56	0.48	8.10	0.11	<0.02	<0.02
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.02	µg/L	2.80	2.59	52.9	1.25	0.02	0.02
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	0.14	0.14	3.14	0.05	<0.02	<0.02
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	5.32	3.94	54.2	1.28	0.02	0.02
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	<0.02	<0.19	<0.02	<0.02	<0.02
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	0.1	1.4	<0.1	<0.1	<0.1
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	0.22	0.23	2.46	<0.02	<0.02	<0.02
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	1.09	1.11	12.8	0.06	<0.02	<0.02
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	0.18	0.18	1.71	<0.02	<0.02	<0.02
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	0.27	0.27	3.37	0.02	<0.01	<0.01
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	<0.02	1.69	<0.02	<0.02	<0.02
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	<0.02	<0.19	<0.02	<0.02	<0.02
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	<0.02	<0.19	<0.02	<0.02	<0.02
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	<0.02	<0.19	<0.02	<0.02	<0.02
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	<0.02	<0.19	<0.02	<0.02	<0.02
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	<0.05	<0.48	<0.05	<0.05	<0.05
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	<0.02	<0.19	<0.02	<0.02	<0.02
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	<0.05	<0.48	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	<0.05	<0.48	<0.05	<0.05	<0.05



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	0229_MW131_210819	0229_QC108_210819	0229_MW074_210819	0229_MW002_210819	0229_MW205S_210819
Sampling date / time					19-Aug-2021 09:30	19-Aug-2021 09:31	19-Aug-2021 10:01	19-Aug-2021 10:30	19-Aug-2021 08:35
Compound	CAS Number	LOR	Unit	ET2103890-089	ET2103890-090	ET2103890-091	ET2103890-092	ET2103890-095	ET2103890-095
				Result	Result	Result	Result	Result	Result
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	<0.05	<0.48	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	<0.05	<0.48	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	<0.02	<0.19	<0.02	<0.02	<0.02
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	<0.02	<0.19	<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	<0.19	<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	0.21	<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	<0.19	<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	<0.19	<0.05	<0.05	<0.05
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L	11.2	9.63	148	2.88	0.04	0.04
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	8.12	6.53	107	2.53	0.04	0.04
Sum of PFAS (WA DER List)	----	0.01	µg/L	10.5	9.01	135	2.72	0.04	0.04
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%	96.0	103	103	106	100	100
13C8-PFOA	----	0.02	%	93.2	108	110	98.0	97.2	97.2



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	0229_SW217_210819	0229_SW205_210819	0229_SW203_210819	0229_QC308_210819	0229_QC309_210819
Sampling date / time				19-Aug-2021 10:40	19-Aug-2021 08:15	19-Aug-2021 11:16	19-Aug-2021 11:25	19-Aug-2021 11:25	
Compound	CAS Number	LOR	Unit	ET2103890-096	ET2103890-097	ET2103890-099	ET2103890-100	ET2103890-101	
				Result	Result	Result	Result	Result	
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	<0.02	0.08	<0.02	<0.02	
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	<0.02	0.05	<0.02	<0.02	
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.02	µg/L	<0.02	<0.02	0.37	<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	<0.01	<0.01	0.36	<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	0.04	<0.02	<0.02	
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02	
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	<0.01	0.02	<0.01	<0.01	
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02	
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02	
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02	
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02	
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02	
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05	
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02	
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05	
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05	



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	0229_SW217_210819	0229_SW205_210819	0229_SW203_210819	0229_QC308_210819	0229_QC309_210819
Sampling date / time				19-Aug-2021 10:40	19-Aug-2021 08:15	19-Aug-2021 11:16	19-Aug-2021 11:25	19-Aug-2021 11:25	
Compound	CAS Number	LOR	Unit	ET2103890-096	ET2103890-097	ET2103890-099	ET2103890-100	ET2103890-101	
				Result	Result	Result	Result	Result	
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05	
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05	
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02	
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02	
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05	
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05	
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05	
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05	
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L	<0.01	<0.01	0.92	<0.01	<0.01	
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	<0.01	<0.01	0.73	<0.01	<0.01	
Sum of PFAS (WA DER List)	----	0.01	µg/L	<0.01	<0.01	0.87	<0.01	<0.01	
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%	115	117	107	116	107	
13C8-PFOA	----	0.02	%	111	113	112	110	109	



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	0229_QC303_210818	0229_QC304_210818	0229_MW232_210820	0229_MW072_210820	0229_QC310_210820
Sampling date / time				18-Aug-2021 12:30	18-Aug-2021 12:30	20-Aug-2021 11:18	20-Aug-2021 11:39	20-Aug-2021 11:47	
Compound	CAS Number	LOR	Unit	ET2103890-102	ET2103890-103	ET2103890-104	ET2103890-105	ET2103890-106	
				Result	Result	Result	Result	Result	
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	<0.02	0.05	5.69	<0.02	
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	<0.02	<0.04	6.91	<0.02	
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.02	µg/L	<0.02	<0.02	0.09	44.9	<0.02	
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	<0.02	<0.04	3.47	<0.02	
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	<0.01	0.06	82.8	<0.01	
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	<0.02	<0.04	<0.24	<0.02	
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	<0.1	<0.2	1.4	<0.1	
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	<0.02	<0.04	1.91	<0.02	
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	<0.02	<0.04	10.1	<0.02	
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	<0.02	<0.04	1.39	<0.02	
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	<0.01	<0.04	2.63	<0.01	
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	<0.02	<0.04	2.82	<0.02	
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	<0.02	<0.04	<0.24	<0.02	
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	<0.02	<0.04	<0.24	<0.02	
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	<0.02	<0.04	<0.24	<0.02	
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	<0.02	<0.04	<0.24	<0.02	
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	<0.05	<0.10	<0.60	<0.05	
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	<0.02	<0.04	<0.24	<0.02	
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	<0.05	<0.10	<0.60	<0.05	
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	<0.05	<0.10	<0.60	<0.05	



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	0229_QC303_210818	0229_QC304_210818	0229_MW232_210820	0229_MW072_210820	0229_QC310_210820
Sampling date / time					18-Aug-2021 12:30	18-Aug-2021 12:30	20-Aug-2021 11:18	20-Aug-2021 11:39	20-Aug-2021 11:47
Compound	CAS Number	LOR	Unit	ET2103890-102	ET2103890-103	ET2103890-104	ET2103890-105	ET2103890-106	
				Result	Result	Result	Result	Result	
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	<0.05	<0.10	<0.60	<0.05	
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	<0.05	<0.10	<0.60	<0.05	
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	<0.02	<0.04	<0.24	<0.02	
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	<0.02	<0.04	<0.24	<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	<0.24	<0.05	
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	<0.05	<0.05	<0.24	<0.05	
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	<0.05	<0.05	<0.24	<0.05	
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	<0.05	<0.05	<0.24	<0.05	
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L	<0.01	<0.01	0.20	164	<0.01	
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	<0.01	<0.01	0.15	128	<0.01	
Sum of PFAS (WA DER List)	----	0.01	µg/L	<0.01	<0.01	0.20	151	<0.01	
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%	114	112	98.9	104	105	
13C8-PFOA	----	0.02	%	108	110	108	104	108	



Surrogate Control Limits

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

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

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

Inter-Laboratory Testing

Analysis conducted by ALS Brisbane, NATA accreditation no. 825, site no. 818 (Chemistry) 18958 (Biology).

- (WATER) EP231A: Perfluoroalkyl Sulfonic Acids
- (WATER) EP231B: Perfluoroalkyl Carboxylic Acids
- (WATER) EP231C: Perfluoroalkyl Sulfonamides
- (WATER) EP231D: (n:2) Fluorotelomer Sulfonic Acids
- (WATER) EP231P: PFAS Sums
- (WATER) EP231S: PFAS Surrogate
- (SOIL) EP231S: PFAS Surrogate
- (SOIL) EA055: Moisture Content (Dried @ 105-110°C)
- (SOIL) EP231B: Perfluoroalkyl Carboxylic Acids
- (SOIL) EP231D: (n:2) Fluorotelomer Sulfonic Acids
- (SOIL) EP231C: Perfluoroalkyl Sulfonamides
- (SOIL) EP231A: Perfluoroalkyl Sulfonic Acids
- (SOIL) EP231P: PFAS Sums

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: ET2103890	Page	: 1 of 18
Client	: AECOM Australia Pty Ltd	Laboratory	: Environmental Division Townsville
Contact	[REDACTED]	Telephone	: +61 7 3552 8616
Project	: QLD_0229_PFASOMP_20	Date Samples Received	: 24-Aug-2021
Site	: QLD_0229	Issue Date	: 02-Sep-2021
Sampler	[REDACTED]	No. of samples received	: 106
Order number	: 60612487_3.1	No. of samples analysed	: 106

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: **SOIL**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
Matrix Spike (MS) Recoveries							
EP231A: Perfluoroalkyl Sulfonic Acids	ET2103890--004	0229_SD110_210816	Perfluorohexane sulfonic acid (PFHxS)	355-46-4	Not Determined	----	MS recovery not determined, background level greater than or equal to 4x spike level.
EP231A: Perfluoroalkyl Sulfonic Acids	ET2103890--004	0229_SD110_210816	Perfluorooctane sulfonic acid (PFOS)	1763-23-1	Not Determined	----	MS recovery not determined, background level greater than or equal to 4x spike level.

Matrix: **WATER**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
Matrix Spike (MS) Recoveries							
EP231A: Perfluoroalkyl Sulfonic Acids	ET2103890--030	0229_MW125S_210817	Perfluorohexane sulfonic acid (PFHxS)	355-46-4	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
	QC	Regular	Actual	Expected	
Laboratory Duplicates (DUP)					
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	7	79	8.86	10.00	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)					
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	2	79	2.53	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: **SOIL**

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

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



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) 0229_SD144_210816, 0229_SD109_210816, 0229_QC101_210816, 0229_SD243_210816, 0229_SD136_210816, 0229_SD133_210816, 0229_SD220_210816,	0229_SD110_210816, 0229_SD139_210816, 0229_SD140_210816, 0229_SD242_210816, 0229_SD121_210816, 0229_SD233_210816, 0229_SD232_210816	16-Aug-2021	----	----	----	26-Aug-2021	30-Aug-2021	✓
HDPE Soil Jar (EA055) 0229_SD113_210818, 0229_QC107_210818, 0229_SD135_210818, 0229_SD130_210818, 0229_SD128_210818, 0229_SD244_210818, 0229_SD245_210818,	0229_SD119_210818, 0229_SD120_210818, 0229_SD134_210818, 0229_SD129_210818, 0229_SD126_210818, 0229_QC102_210818, 0229_SD227_210818	18-Aug-2021	----	----	----	26-Aug-2021	01-Sep-2021	✓
HDPE Soil Jar (EA055) 0229_SD205_210819, 0229_SD203_210819	0229_SD217_210819,	19-Aug-2021	----	----	----	26-Aug-2021	02-Sep-2021	✓
EP231A: Perfluoroalkyl Sulfonic Acids								
HDPE Soil Jar (EP231X) 0229_SD144_210816, 0229_SD109_210816, 0229_QC101_210816, 0229_SD243_210816, 0229_SD136_210816, 0229_SD133_210816, 0229_SD220_210816,	0229_SD110_210816, 0229_SD139_210816, 0229_SD140_210816, 0229_SD242_210816, 0229_SD121_210816, 0229_SD233_210816, 0229_SD232_210816	16-Aug-2021	26-Aug-2021	12-Feb-2022	✓	30-Aug-2021	05-Oct-2021	✓
HDPE Soil Jar (EP231X) 0229_SD113_210818, 0229_QC107_210818, 0229_SD135_210818,	0229_SD119_210818, 0229_SD120_210818, 0229_SD134_210818	18-Aug-2021	26-Aug-2021	14-Feb-2022	✓	30-Aug-2021	05-Oct-2021	✓
HDPE Soil Jar (EP231X) 0229_SD130_210818, 0229_SD128_210818, 0229_SD244_210818, 0229_SD245_210818,	0229_SD129_210818, 0229_SD126_210818, 0229_QC102_210818, 0229_SD227_210818	18-Aug-2021	27-Aug-2021	14-Feb-2022	✓	30-Aug-2021	06-Oct-2021	✓
HDPE Soil Jar (EP231X) 0229_SD205_210819, 0229_SD203_210819	0229_SD217_210819,	19-Aug-2021	27-Aug-2021	15-Feb-2022	✓	30-Aug-2021	06-Oct-2021	✓



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	
EP231B: Perfluoroalkyl Carboxylic Acids								
HDPE Soil Jar (EP231X) 0229_SD144_210816, 0229_SD109_210816, 0229_QC101_210816, 0229_SD243_210816, 0229_SD136_210816, 0229_SD133_210816, 0229_SD220_210816,	0229_SD110_210816, 0229_SD139_210816, 0229_SD140_210816, 0229_SD242_210816, 0229_SD121_210816, 0229_SD233_210816, 0229_SD232_210816	16-Aug-2021	26-Aug-2021	12-Feb-2022	✓	30-Aug-2021	05-Oct-2021	✓
HDPE Soil Jar (EP231X) 0229_SD113_210818, 0229_QC107_210818, 0229_SD135_210818,	0229_SD119_210818, 0229_SD120_210818, 0229_SD134_210818	18-Aug-2021	26-Aug-2021	14-Feb-2022	✓	30-Aug-2021	05-Oct-2021	✓
HDPE Soil Jar (EP231X) 0229_SD130_210818, 0229_SD128_210818, 0229_SD244_210818, 0229_SD245_210818,	0229_SD129_210818, 0229_SD126_210818, 0229_QC102_210818, 0229_SD227_210818	18-Aug-2021	27-Aug-2021	14-Feb-2022	✓	30-Aug-2021	06-Oct-2021	✓
HDPE Soil Jar (EP231X) 0229_SD205_210819, 0229_SD203_210819	0229_SD217_210819,	19-Aug-2021	27-Aug-2021	15-Feb-2022	✓	30-Aug-2021	06-Oct-2021	✓
EP231C: Perfluoroalkyl Sulfonamides								
HDPE Soil Jar (EP231X) 0229_SD144_210816, 0229_SD109_210816, 0229_QC101_210816, 0229_SD243_210816, 0229_SD136_210816, 0229_SD133_210816, 0229_SD220_210816,	0229_SD110_210816, 0229_SD139_210816, 0229_SD140_210816, 0229_SD242_210816, 0229_SD121_210816, 0229_SD233_210816, 0229_SD232_210816	16-Aug-2021	26-Aug-2021	12-Feb-2022	✓	30-Aug-2021	05-Oct-2021	✓
HDPE Soil Jar (EP231X) 0229_SD113_210818, 0229_QC107_210818, 0229_SD135_210818,	0229_SD119_210818, 0229_SD120_210818, 0229_SD134_210818	18-Aug-2021	26-Aug-2021	14-Feb-2022	✓	30-Aug-2021	05-Oct-2021	✓
HDPE Soil Jar (EP231X) 0229_SD130_210818, 0229_SD128_210818, 0229_SD244_210818, 0229_SD245_210818,	0229_SD129_210818, 0229_SD126_210818, 0229_QC102_210818, 0229_SD227_210818	18-Aug-2021	27-Aug-2021	14-Feb-2022	✓	30-Aug-2021	06-Oct-2021	✓
HDPE Soil Jar (EP231X) 0229_SD205_210819, 0229_SD203_210819	0229_SD217_210819,	19-Aug-2021	27-Aug-2021	15-Feb-2022	✓	30-Aug-2021	06-Oct-2021	✓



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) 0229_SD144_210816, 0229_SD109_210816, 0229_QC101_210816, 0229_SD243_210816, 0229_SD136_210816, 0229_SD133_210816, 0229_SD220_210816,	0229_SD110_210816, 0229_SD139_210816, 0229_SD140_210816, 0229_SD242_210816, 0229_SD121_210816, 0229_SD233_210816, 0229_SD232_210816	16-Aug-2021	26-Aug-2021	12-Feb-2022	✓	30-Aug-2021	05-Oct-2021	✓
HDPE Soil Jar (EP231X) 0229_SD113_210818, 0229_QC107_210818, 0229_SD135_210818,	0229_SD119_210818, 0229_SD120_210818, 0229_SD134_210818	18-Aug-2021	26-Aug-2021	14-Feb-2022	✓	30-Aug-2021	05-Oct-2021	✓
HDPE Soil Jar (EP231X) 0229_SD130_210818, 0229_SD128_210818, 0229_SD244_210818, 0229_SD245_210818,	0229_SD129_210818, 0229_SD126_210818, 0229_QC102_210818, 0229_SD227_210818	18-Aug-2021	27-Aug-2021	14-Feb-2022	✓	30-Aug-2021	06-Oct-2021	✓
HDPE Soil Jar (EP231X) 0229_SD205_210819, 0229_SD203_210819	0229_SD217_210819,	19-Aug-2021	27-Aug-2021	15-Feb-2022	✓	30-Aug-2021	06-Oct-2021	✓
EP231P: PFAS Sums								
HDPE Soil Jar (EP231X) 0229_SD144_210816, 0229_SD109_210816, 0229_QC101_210816, 0229_SD243_210816, 0229_SD136_210816, 0229_SD133_210816, 0229_SD220_210816,	0229_SD110_210816, 0229_SD139_210816, 0229_SD140_210816, 0229_SD242_210816, 0229_SD121_210816, 0229_SD233_210816, 0229_SD232_210816	16-Aug-2021	26-Aug-2021	12-Feb-2022	✓	30-Aug-2021	05-Oct-2021	✓
HDPE Soil Jar (EP231X) 0229_SD113_210818, 0229_QC107_210818, 0229_SD135_210818,	0229_SD119_210818, 0229_SD120_210818, 0229_SD134_210818	18-Aug-2021	26-Aug-2021	14-Feb-2022	✓	30-Aug-2021	05-Oct-2021	✓
HDPE Soil Jar (EP231X) 0229_SD130_210818, 0229_SD128_210818, 0229_SD244_210818, 0229_SD245_210818,	0229_SD129_210818, 0229_SD126_210818, 0229_QC102_210818, 0229_SD227_210818	18-Aug-2021	27-Aug-2021	14-Feb-2022	✓	30-Aug-2021	06-Oct-2021	✓
HDPE Soil Jar (EP231X) 0229_SD205_210819, 0229_SD203_210819	0229_SD217_210819,	19-Aug-2021	27-Aug-2021	15-Feb-2022	✓	30-Aug-2021	06-Oct-2021	✓

Matrix: **WATER**

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

Page : 6 of 18
Work Order : ET2103890
Client : AECOM Australia Pty Ltd
Project : QLD_0229_PFASOMP_20



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		
EP231A: Perfluoroalkyl Sulfonic Acids - Continued									
0229_MW236S_210819, 0229_MW074_210819, 0229_MW205S_210819, 0229_SW205_210819, 0229_QC308_210819,	0229_MW131_210819, 0229_MW002_210819, 0229_SW217_210819, 0229_SW203_210819, 0229_QC309_210819	19-Aug-2021	31-Aug-2021	15-Feb-2022	✓	31-Aug-2021	15-Feb-2022	✓	
HDPE (no PTFE) (EP231X) 0229_MW232_210820, 0229_QC310_210820	0229_MW072_210820,	20-Aug-2021	31-Aug-2021	16-Feb-2022	✓	31-Aug-2021	16-Feb-2022	✓	



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 - Continued									
0229_MW236S_210819, 0229_MW074_210819, 0229_MW205S_210819, 0229_SW205_210819, 0229_QC308_210819,	0229_MW131_210819, 0229_MW002_210819, 0229_SW217_210819, 0229_SW203_210819, 0229_QC309_210819	19-Aug-2021	31-Aug-2021	15-Feb-2022	✓	31-Aug-2021	15-Feb-2022	✓	
HDPE (no PTFE) (EP231X) 0229_MW232_210820, 0229_QC310_210820	0229_MW072_210820,	20-Aug-2021	31-Aug-2021	16-Feb-2022	✓	31-Aug-2021	16-Feb-2022	✓	



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 - Continued									
0229_MW236S_210819, 0229_MW074_210819, 0229_MW205S_210819, 0229_SW205_210819, 0229_QC308_210819,	0229_MW131_210819, 0229_MW002_210819, 0229_SW217_210819, 0229_SW203_210819, 0229_QC309_210819	19-Aug-2021	31-Aug-2021	15-Feb-2022	✓	31-Aug-2021	15-Feb-2022	✓	
HDPE (no PTFE) (EP231X) 0229_MW232_210820, 0229_QC310_210820	0229_MW072_210820,	20-Aug-2021	31-Aug-2021	16-Feb-2022	✓	31-Aug-2021	16-Feb-2022	✓	



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 - Continued								
0229_MW236S_210819, 0229_MW074_210819, 0229_MW205S_210819, 0229_SW205_210819, 0229_QC308_210819,	0229_MW131_210819, 0229_MW002_210819, 0229_SW217_210819, 0229_SW203_210819, 0229_QC309_210819	19-Aug-2021	31-Aug-2021	15-Feb-2022	✓	31-Aug-2021	15-Feb-2022	✓
HDPE (no PTFE) (EP231X) 0229_MW232_210820, 0229_QC310_210820	0229_MW072_210820,	20-Aug-2021	31-Aug-2021	16-Feb-2022	✓	31-Aug-2021	16-Feb-2022	✓



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 - Continued									
0229_MW236S_210819, 0229_MW074_210819, 0229_MW205S_210819, 0229_SW205_210819, 0229_QC308_210819,	0229_MW131_210819, 0229_MW002_210819, 0229_SW217_210819, 0229_SW203_210819, 0229_QC309_210819	19-Aug-2021	31-Aug-2021	15-Feb-2022	✓	31-Aug-2021	15-Feb-2022	✓	
HDPE (no PTFE) (EP231X) 0229_MW232_210820, 0229_QC310_210820	0229_MW072_210820,	20-Aug-2021	31-Aug-2021	16-Feb-2022	✓	31-Aug-2021	16-Feb-2022	✓	



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	Method	Count		Rate (%)			Quality Control Specification
		QC	Regular	Actual	Expected	Evaluation	
Analytical Methods							
Laboratory Duplicates (DUP)							
Moisture Content	EA055	4	35	11.43	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

Matrix: WATER

Evaluation: ✖ = Quality Control frequency not within specification ; ✔ = Quality Control frequency within specification.

Quality Control Sample Type	Method	Count		Rate (%)			Quality Control Specification
		QC	Regular	Actual	Expected	Evaluation	
Analytical Methods							
Laboratory Duplicates (DUP)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	7	79	8.86	10.00	✖	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	6	79	7.59	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	6	79	7.59	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	79	2.53	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.
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
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.
Solid Phase Extraction (SPE) for PFAS in water	ORG72	WATER	In-house: Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to the sample container. The entire contents are transferred to a solid phase extraction (SPE) cartridge. The sample container is successively rinsed with aliquots of the elution solvent. The eluted extract is combined with an equal volume of reagent water and a portion is filtered for analysis. Method procedures conform to US DoD QSM 5.3, table B-15 requirements.

QUALITY CONTROL REPORT

Work Order	: ET2103890	Page	: 1 of 27
Client	: AECOM Australia Pty Ltd	Laboratory	: Environmental Division Townsville
Contact	: [REDACTED]	Contact	: [REDACTED]
Address	: [REDACTED]	Address	: 13 Carlton Street, Kirwan Townsville QLD Australia 4815
	: BRISBANE		
Telephone	: ----	Telephone	: +61 7 3552 8616
Project	: QLD_0229_PFASOMP_20	Date Samples Received	: 24-Aug-2021
Order number	: 60612487_3.1	Date Analysis Commenced	: 26-Aug-2021
C-O-C number	: 26431	Issue Date	: 02-Sep-2021
Sampler	: [REDACTED]		
Site	: QLD_0229		
Quote number	: TV/007/21 - Compass		
No. of samples received	: 106		
No. of samples analysed	: 106		



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 Acid Sulfate Soil Chemist	Brisbane Inorganics, Stafford, QLD
[REDACTED]	Senior Organic Chemist	Brisbane Organics, Stafford, QLD
[REDACTED]	Senior Organic Chemist - PFAS	Brisbane Inorganics, Stafford, QLD
[REDACTED]	Senior Organic Chemist - PFAS	Brisbane Organics, Stafford, QLD



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: 3867045)									
ET2103890-003	0229_SD144_210816	EA055: Moisture Content	----	0.1	%	33.7	33.8	0.0	0% - 20%
ET2103890-019	0229_SD133_210816	EA055: Moisture Content	----	0.1	%	2.6	2.6	0.0	0% - 20%
EA055: Moisture Content (Dried @ 105-110°C) (QC Lot: 3867049)									
EB2123703-067	Anonymous	EA055: Moisture Content	----	0.1	%	24.5	25.2	2.5	0% - 20%
ET2103890-083	0229_SD245_210818	EA055: Moisture Content	----	0.1	%	41.4	41.6	0.6	0% - 20%
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 3867044)									
ET2103890-003	0229_SD144_210816	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	0.0004	38.0	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	0.0058	0.0070	18.3	0% - 20%
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
ET2103890-019	0229_SD133_210816	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	0.0007	0.0006	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: 3867048)									
EB2123703-051	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	0.0004	0.0004	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	0.0007	0.0008	0.0	No Limit
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	0.0115	0.0116	1.2	0% - 20%
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	0.0011	0.0011	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: 3867048) - continued									
EB2123703-051	Anonymous	EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	0.0201	0.0208	3.5	0% - 20%
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
ET2103890-078	0229_SD126_210818	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: 3867044)									
ET2103890-003	0229_SD144_210816	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
ET2103890-019	0229_SD133_210816	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: 3867048)									
EB2123703-051	Anonymous	EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	0.0004	0.0004	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	0.0016	0.0016	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: 3867048) - continued									
EB2123703-051	Anonymous	EP231X: Perfluorotridecanoic acid (PFTTrDA)	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
ET2103890-078	0229_SD126_210818	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 (PFTTrDA)	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: 3867044)									
ET2103890-003	0229_SD144_210816	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
ET2103890-019	0229_SD133_210816	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



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: 3867048)									
EB2123703-051	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
ET2103890-078	0229_SD126_210818	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: 3867044)									
ET2103890-003	0229_SD144_210816	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
ET2103890-019	0229_SD133_210816	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



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: 3867044) - continued									
ET2103890-019	0229_SD133_210816	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: 3867048)									
EB2123703-051	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
ET2103890-078	0229_SD126_210818	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: 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: 3866264)									
ET2103890-012	0229_SW243_210816	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: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	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
ET2103890-032	0229_MW116_210818	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	0.11	0.10	10.8	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	0.05	0.05	0.0	No Limit
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.02	µg/L	0.12	0.12	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: 3866265)									
ET2103890-038	0229_MW135_210818	EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	2.41	2.90	18.5	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	0.16	14.2	No Limit
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.02	µg/L	1.70	1.87	9.7	0% - 20%
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	0.11	0.14	19.6	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: 3866265) - continued									
ET2103890-038	0229_MW135_210818	EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
ET2103890-042	0229_MW128_210818	EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	461	498	7.8	0% - 20%
		EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	28.9	30.1	4.0	0% - 20%
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	32.8	34.4	4.6	0% - 20%
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.02	µg/L	306	318	3.9	0% - 20%
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	21.2	21.1	0.3	0% - 20%
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.81	<0.83	3.2	No Limit
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 3866266)									
ET2103890-061	0229_SW134_210818	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: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	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: 3866269)									
ET2103890-092	0229_MW002_210819	EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	1.28	1.19	7.6	0% - 20%
		EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	0.11	0.11	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: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.02	µg/L	1.25	1.25	0.0	0% - 20%
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	0.05	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: 3870915)									
EB2123877-016	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: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	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: 3866264)									
ET2103890-012	0229_SW243_210816	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



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: 3866264) - continued									
ET2103890-012	0229_SW243_210816	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	<0.1	0.0	No Limit
ET2103890-032	0229_MW116_210818	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	0.05	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 (PFTTrDA)	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: 3866265)									
ET2103890-038	0229_MW135_210818	EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	0.07	0.08	13.5	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	0.15	0.16	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 (PFTTrDA)	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
ET2103890-042	0229_MW128_210818	EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	19.4	18.4	5.5	0% - 20%
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	15.6	15.5	0.5	0% - 50%
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	80.1	80.9	0.9	0% - 20%
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	8.22	7.99	2.9	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	20.8	21.5	3.2	0% - 20%
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.81	<0.83	3.2	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.81	<0.83	3.2	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.81	<0.83	3.2	No Limit
		EP231X: Perfluorotridecanoic acid (PFTTrDA)	72629-94-8	0.02	µg/L	<0.81	<0.83	3.2	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<2.02	<2.08	3.2	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	6.0	6.2	3.2	No Limit
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 3866266)									
ET2103890-061	0229_SW134_210818	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: 3866266) - continued									
ET2103890-061	0229_SW134_210818	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: 3866269)									
ET2103890-092	0229_MW002_210819	EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	0.02	0.02	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: 3870915)									
EB2123877-016	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: 3866264)									
ET2103890-012	0229_SW243_210816	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: 3866264) - continued									
ET2103890-012	0229_SW243_210816	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
ET2103890-032	0229_MW116_210818	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: 3866265)									
ET2103890-038	0229_MW135_210818	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
ET2103890-042	0229_MW128_210818	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.81	<0.83	3.2	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.81	<0.83	3.2	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.81	<0.83	3.2	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<2.02	<2.08	3.2	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: 3866265) - continued									
ET2103890-042	0229_MW128_210818	EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<2.02	<2.08	3.2	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<2.02	<2.08	3.2	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<2.02	<2.08	3.2	No Limit
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 3866266)									
ET2103890-061	0229_SW134_210818	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: 3866269)									
ET2103890-092	0229_MW002_210819	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: 3870915)									
EB2123877-016	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: 3870915) - continued									
EB2123877-016	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
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 3866264)									
ET2103890-012	0229_SW243_210816	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
ET2103890-032	0229_MW116_210818	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: 3866265)									
ET2103890-038	0229_MW135_210818	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
ET2103890-042	0229_MW128_210818	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.81	<0.83	3.2	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.81	<0.83	3.2	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.81	<0.83	3.2	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: 3866265) - continued									
ET2103890-042	0229_MW128_210818	EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.81	<0.83	3.2	No Limit
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 3866266)									
ET2103890-061	0229_SW134_210818	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: 3866269)									
ET2103890-092	0229_MW002_210819	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: 3870915)									
EB2123877-016	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: 3866264)									
ET2103890-012	0229_SW243_210816	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
ET2103890-032	0229_MW116_210818	EP231X: Sum of PFAS	----	0.01	µg/L	0.36	0.35	2.8	0% - 20%
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	0.13	0.13	0.0	0% - 50%
		EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	0.31	0.30	3.3	0% - 20%
EP231P: PFAS Sums (QC Lot: 3866265)									
ET2103890-038	0229_MW135_210818	EP231X: Sum of PFAS	----	0.01	µg/L	4.74	5.47	14.3	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 (%)
EP231P: PFAS Sums (QC Lot: 3866265) - continued									
ET2103890-038	0229_MW135_210818	EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	4.11	4.77	14.9	0% - 20%
		EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	4.49	5.17	14.1	0% - 20%
ET2103890-042	0229_MW128_210818	EP231X: Sum of PFAS	----	0.01	µg/L	1000	1050	5.1	0% - 20%
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	767	816	6.2	0% - 20%
		EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	925	975	5.2	0% - 20%
EP231P: PFAS Sums (QC Lot: 3866266)									
ET2103890-061	0229_SW134_210818	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: 3866269)									
ET2103890-092	0229_MW002_210819	EP231X: Sum of PFAS	----	0.01	µg/L	2.88	2.79	3.2	0% - 20%
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	2.53	2.44	3.6	0% - 20%
		EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	2.72	2.63	3.4	0% - 20%
EP231P: PFAS Sums (QC Lot: 3870915)									
EB2123877-016	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: **SOIL**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report				
				Result	Spike Concentration	Spike Recovery (%)		Acceptable Limits (%)	
						LCS	Low	High	
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 3867044)									
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	0.0011 mg/kg	76.4	72.0	128	
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	0.00117 mg/kg	82.5	73.0	123	
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	0.00118 mg/kg	75.0	67.0	130	
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	0.00119 mg/kg	80.2	70.0	132	
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	0.00116 mg/kg	77.2	68.0	136	
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	0.0012 mg/kg	74.2	59.0	134	
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 3867048)									
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	0.0011 mg/kg	80.0	72.0	128	
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	0.00117 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	77.1	67.0	130	
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	0.00119 mg/kg	79.4	70.0	132	
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	0.00116 mg/kg	75.9	68.0	136	
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	0.0012 mg/kg	75.0	59.0	134	
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 3867044)									
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	0.00625 mg/kg	76.8	71.0	135	
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	0.00125 mg/kg	74.8	69.0	132	
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	0.00125 mg/kg	81.2	70.0	132	
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	0.00125 mg/kg	78.4	71.0	131	
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	76.8	69.0	133	
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	77.2	72.0	129	
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	0.00125 mg/kg	72.8	69.0	133	
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	75.6	64.0	136	
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	76.0	69.0	135	
EP231X: Perfluorotridecanoic acid (PFTTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	76.0	66.0	139	
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	0.00312 mg/kg	83.0	69.0	133	
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 3867048)									
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	0.00625 mg/kg	76.0	71.0	135	
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	0.00125 mg/kg	72.4	69.0	132	
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	0.00125 mg/kg	72.4	70.0	132	
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	0.00125 mg/kg	72.4	71.0	131	
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	72.0	69.0	133	
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	76.0	72.0	129	
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	0.00125 mg/kg	73.6	69.0	133	
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	74.4	64.0	136	



Sub-Matrix: **SOIL**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report Result	Laboratory Control Spike (LCS) Report				
					Spike Concentration	Spike Recovery (%)		Acceptable Limits (%)	
						LCS	Low	High	
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 3867048) - continued									
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	75.6	69.0	135	
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	78.8	66.0	139	
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	0.00312 mg/kg	76.9	69.0	133	
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 3867044)									
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	0.00125 mg/kg	76.4	67.0	137	
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	0.00312 mg/kg	80.8	59.6	143	
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	0.00312 mg/kg	79.6	62.8	140	
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	0.00312 mg/kg	77.2	61.5	139	
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	0.00312 mg/kg	77.9	61.9	137	
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	0.00125 mg/kg	88.0	63.0	144	
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	0.00125 mg/kg	88.0	61.0	139	
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 3867048)									
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	0.00125 mg/kg	72.4	67.0	137	
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	0.00312 mg/kg	80.1	59.6	143	
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	0.00312 mg/kg	84.4	62.8	140	
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	0.00312 mg/kg	74.0	61.5	139	
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	0.00312 mg/kg	78.8	61.9	137	
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	0.00125 mg/kg	79.6	63.0	144	
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	0.00125 mg/kg	77.2	61.0	139	
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 3867044)									
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	0.00117 mg/kg	67.5	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	86.0	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	84.6	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	77.9	54.8	124	
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 3867048)									
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	0.00117 mg/kg	78.6	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	82.6	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	81.7	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	88.3	54.8	124	

Sub-Matrix: **WATER**

Method Blank (MB) Report	Laboratory Control Spike (LCS) Report		
	Spike	Spike Recovery (%)	Acceptable Limits (%)



Sub-Matrix: WATER

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
				Result	Spike	Spike Recovery (%)	Acceptable Limits (%)	
					Concentration	LCS	Low	High
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 3866264)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.2218 µg/L	97.6	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	0.02	µg/L	<0.02	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	97.7	69.0	134
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.232 µg/L	95.2	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: 3866265)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.2218 µg/L	88.4	72.0	130
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.2352 µg/L	91.4	71.0	127
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.02	µg/L	<0.02	0.2373 µg/L	90.8	68.0	131
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.238 µg/L	90.1	69.0	134
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.232 µg/L	90.9	65.0	140
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.241 µg/L	91.5	53.0	142
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 3866266)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.2218 µg/L	106	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	0.02	µg/L	<0.02	0.2373 µg/L	98.6	68.0	131
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.238 µg/L	109	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	112	53.0	142
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 3866269)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.2218 µg/L	98.3	72.0	130
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.2352 µg/L	124	71.0	127
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.02	µg/L	<0.02	0.2373 µg/L	120	68.0	131
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.238 µg/L	118	69.0	134
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.232 µg/L	108	65.0	140
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.241 µg/L	115	53.0	142
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 3870915)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.2218 µg/L	110	72.0	130
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.2352 µg/L	109	71.0	127
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.02	µg/L	<0.02	0.2373 µg/L	105	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	108	65.0	140
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.241 µg/L	102	53.0	142
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 3875218)								
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	98.2	71.0	127
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.02	µg/L	<0.02	0.2373 µg/L	83.6	68.0	131



Sub-Matrix: WATER

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report				
				Result	Spike	Spike Recovery (%)		Acceptable Limits (%)	
					Concentration	LCS	Low	High	
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 3875218) - continued									
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.238 µg/L	85.9	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	85.7	53.0	142	
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 3866264)									
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	97.4	72.0	129	
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	0.25 µg/L	97.2	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	99.4	71.0	133	
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	0.25 µg/L	93.6	69.0	130	
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	0.25 µg/L	89.0	71.0	129	
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	0.25 µg/L	99.0	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	108	65.0	144	
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	0.625 µg/L	99.4	71.0	132	
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 3866265)									
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	92.6	72.0	129	
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	0.25 µg/L	94.8	72.0	129	
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	0.25 µg/L	94.4	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	93.2	69.0	130	
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	0.25 µg/L	84.2	71.0	129	
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	0.25 µg/L	99.2	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	89.6	65.0	144	
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	0.625 µg/L	95.7	71.0	132	
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 3866266)									
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	1.25 µg/L	91.2	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	102	72.0	129	
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	0.25 µg/L	106	72.0	130	
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	0.25 µg/L	106	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	108	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	104	72.0	134	
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	0.25 µg/L	109	65.0	144	



Sub-Matrix: WATER

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report				
				Result	Spike Concentration	Spike Recovery (%)		Acceptable Limits (%)	
						LCS	Low	High	
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 3866266) - continued									
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	0.625 µg/L	94.4	71.0	132	
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 3866269)									
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	1.25 µg/L	111	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	104	72.0	129	
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	0.25 µg/L	109	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	94.8	69.0	130	
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	0.25 µg/L	100	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	102	72.0	134	
EP231X: Perfluorotridecanoic acid (PFTTrDA)	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	0.625 µg/L	104	71.0	132	
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 3870915)									
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	1.25 µg/L	110	73.0	129	
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	0.25 µg/L	108	72.0	129	
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	0.25 µg/L	113	72.0	129	
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	0.25 µg/L	108	72.0	130	
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	0.25 µg/L	113	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	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	107	72.0	134	
EP231X: Perfluorotridecanoic acid (PFTTrDA)	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	0.625 µg/L	107	71.0	132	
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 3875218)									
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	1.25 µg/L	80.8	73.0	129	
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	0.25 µg/L	80.0	72.0	129	
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	0.25 µg/L	94.6	72.0	129	
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	0.25 µg/L	98.2	72.0	130	
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	0.25 µg/L	99.0	71.0	133	
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	0.25 µg/L	88.4	69.0	130	
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	0.25 µg/L	92.0	71.0	129	
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	0.25 µg/L	99.6	69.0	133	
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	0.25 µg/L	91.2	72.0	134	
EP231X: Perfluorotridecanoic acid (PFTTrDA)	72629-94-8	0.02	µg/L	<0.02	0.25 µg/L	95.4	65.0	144	
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	0.625 µg/L	84.6	71.0	132	
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 3866264)									



Sub-Matrix: WATER

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
				Result	Spike Concentration	Spike Recovery (%)	Acceptable Limits (%)	
					LCS	Low	High	
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 3866264) - continued								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.25 µg/L	95.2	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	111	60.5	138
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	0.625 µg/L	97.0	68.3	134
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	0.625 µg/L	108	62.6	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	102	61.0	135
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 3866265)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.25 µg/L	95.2	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	0.625 µg/L	83.6	68.0	141
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	0.625 µg/L	93.7	60.5	138
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	0.625 µg/L	86.9	68.3	134
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	0.625 µg/L	98.3	62.6	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	112	61.0	135
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 3866266)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.25 µg/L	95.8	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	0.625 µg/L	118	68.0	141
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	0.625 µg/L	98.2	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	62.6	138
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	0.25 µg/L	105	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: 3866269)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.25 µg/L	102	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	0.625 µg/L	110	68.0	141
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	0.625 µg/L	94.2	60.5	138



Sub-Matrix: WATER

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report				
				Result	Spike	Spike Recovery (%)		Acceptable Limits (%)	
					Concentration	LCS	Low	High	
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 3866269) - continued									
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	0.625 µg/L	97.4	68.3	134	
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	0.625 µg/L	111	62.6	138	
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	0.25 µg/L	107	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	
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 3870915)									
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	118	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	115	68.3	134	
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	0.625 µg/L	119	62.6	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	110	61.0	135	
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 3875218)									
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	98.6	68.0	141	
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	0.625 µg/L	93.3	60.5	138	
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	0.625 µg/L	93.2	68.3	134	
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	0.625 µg/L	87.1	62.6	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	79.4	61.0	135	
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 3866264)									
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.2343 µg/L	97.7	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	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	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	91.3	64.2	133	
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 3866265)									
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.2343 µg/L	80.0	63.0	143	



Sub-Matrix: WATER

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report Result	Laboratory Control Spike (LCS) Report			
					Spike Concentration	Spike Recovery (%)	Acceptable Limits (%)	
						LCS	Low	High
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 3866265) - continued								
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	0.2378 µg/L	98.2	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	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	105	64.2	133
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 3866266)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.2343 µg/L	91.3	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	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	106	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	108	64.2	133
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 3866269)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.2343 µg/L	88.1	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	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	117	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	107	64.2	133
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 3870915)								
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	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	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	97.7	64.2	133
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 3875218)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.2343 µg/L	86.0	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	94.2	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	95.4	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	96.7	64.2	133
EP231P: PFAS Sums (QCLot: 3866264)								
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: 3866265)								
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: 3866266)								
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	Spike Recovery (%)	Acceptable Limits (%)	
						LCS	Low	High
EP231P: PFAS Sums (QCLot: 3866269)								
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: 3870915)								
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: 3875218)								
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: **SOIL**

Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report			
				Spike Concentration	Spike Recovery(%)	Acceptable Limits (%)	
				Concentration	MS	Low	High
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 3867044)							
ET2103890-004	0229_SD110_210816	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0011 mg/kg	93.6	72.0	128
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.00117 mg/kg	107	73.0	123
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.00118 mg/kg	# Not Determined	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	# Not Determined	68.0	136
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0012 mg/kg	80.0	59.0	134
		EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 3867048)					
EB2123703-064	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0011 mg/kg	80.4	72.0	128
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.00117 mg/kg	83.3	73.0	123
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.00118 mg/kg	76.3	67.0	130
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.00119 mg/kg	80.2	70.0	132
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.00116 mg/kg	73.7	68.0	136
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0012 mg/kg	75.4	59.0	134



Sub-Matrix: SOIL

Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report			
				Spike Concentration	SpikeRecovery(%) MS	Acceptable Limits (%)	
						Low	High
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 3867044)							
ET2103890-004	0229_SD110_210816	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.00625 mg/kg	77.7	71.0	135
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.00125 mg/kg	82.0	69.0	132
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.00125 mg/kg	110	70.0	132
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.00125 mg/kg	80.4	71.0	131
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.00125 mg/kg	76.0	69.0	133
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.00125 mg/kg	85.6	72.0	129
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.00125 mg/kg	78.0	69.0	133
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.00125 mg/kg	75.6	64.0	136
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.00125 mg/kg	73.2	69.0	135
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.00125 mg/kg	76.0	66.0	139
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.00312 mg/kg	78.5	69.0	133
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 3867048)							
EB2123703-064	Anonymous	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.00625 mg/kg	72.8	71.0	135
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.00125 mg/kg	72.0	69.0	132
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.00125 mg/kg	74.8	70.0	132
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.00125 mg/kg	71.2	71.0	131
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.00125 mg/kg	74.8	69.0	133
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.00125 mg/kg	72.8	72.0	129
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.00125 mg/kg	74.4	69.0	133
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.00125 mg/kg	74.0	64.0	136
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.00125 mg/kg	73.6	69.0	135
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.00125 mg/kg	80.0	66.0	139
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.00312 mg/kg	77.2	69.0	133
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 3867044)							
ET2103890-004	0229_SD110_210816	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.00125 mg/kg	70.8	48.0	128
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.00312 mg/kg	93.4	70.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.00312 mg/kg	80.8	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.00312 mg/kg	77.7	70.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.00312 mg/kg	77.7	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.00125 mg/kg	82.0	63.0	144
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.00125 mg/kg	100	61.0	139
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 3867048)							
EB2123703-064	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.00125 mg/kg	75.2	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: 3867048) - continued							
EB2123703-064	Anonymous	EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.00312 mg/kg	78.7	70.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.00312 mg/kg	73.1	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.00312 mg/kg	72.3	70.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.00312 mg/kg	76.1	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.00125 mg/kg	71.6	63.0	144
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.00125 mg/kg	74.0	61.0	139
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 3867044)							
ET2103890-004	0229_SD110_210816	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.00117 mg/kg	72.2	62.0	145
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.00118 mg/kg	86.9	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0012 mg/kg	89.2	65.0	137
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0012 mg/kg	73.3	70.0	130
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 3867048)							
EB2123703-064	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.00117 mg/kg	73.9	62.0	145
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.00118 mg/kg	80.9	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0012 mg/kg	77.9	65.0	137
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0012 mg/kg	80.4	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
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 3866264)							
ET2103890-030	0229_MW125S_210817	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.2218 µg/L	91.6	72.0	130
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.235 µg/L	100	71.0	127
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.2352 µg/L	# Not Determined	68.0	131
		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	86.9	65.0	140
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.241 µg/L	97.0	53.0	142
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 3866265)							
ET2103890-048	0229_MW106_210818	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.2218 µg/L	95.5	72.0	130
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.235 µg/L	105	71.0	127
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.2352 µg/L	109	68.0	131
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.238 µg/L	116	69.0	134
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.232 µg/L	114	65.0	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
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 3866265) - continued							
ET2103890-048	0229_MW106_210818	EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.241 µg/L	108	53.0	142
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 3866264)							
ET2103890-030	0229_MW125S_210817	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	1.25 µg/L	89.1	73.0	129
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.25 µg/L	85.9	72.0	129
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.25 µg/L	77.0	72.0	129
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.25 µg/L	91.4	72.0	130
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.25 µg/L	93.5	71.0	133
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.25 µg/L	86.2	69.0	130
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.25 µg/L	89.6	71.0	129
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.25 µg/L	92.0	69.0	133
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.25 µg/L	93.8	72.0	134
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.25 µg/L	92.0	65.0	144
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.625 µg/L	93.4	71.0	132
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 3866265)							
ET2103890-048	0229_MW106_210818	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	1.25 µg/L	102	73.0	129
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.25 µg/L	114	72.0	129
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.25 µg/L	112	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	107	71.0	133
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.25 µg/L	103	69.0	130
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.25 µg/L	98.8	71.0	129
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.25 µg/L	107	69.0	133
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.25 µg/L	98.6	72.0	134
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.25 µg/L	92.6	65.0	144
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.625 µg/L	106	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 3866264)							
ET2103890-030	0229_MW125S_210817	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.25 µg/L	91.0	59.0	135
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.625 µg/L	105	70.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.625 µg/L	80.3	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.625 µg/L	92.6	70.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.625 µg/L	97.9	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.25 µg/L	100	65.0	136
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.25 µg/L	96.8	61.0	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: 3866265)							
ET2103890-048	0229_MW106_210818	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	114	70.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.625 µg/L	97.0	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	107	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.25 µg/L	110	65.0	136
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.25 µg/L	106	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 3866264)							
ET2103890-030	0229_MW125S_210817	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.234 µg/L	81.8	63.0	143
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.2378 µg/L	96.3	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.24 µg/L	88.3	67.0	138
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.2415 µg/L	83.4	70.0	130
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 3866265)							
ET2103890-048	0229_MW106_210818	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.234 µg/L	107	63.0	143
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.2378 µg/L	117	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.24 µg/L	122	67.0	138
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.2415 µg/L	108	70.0	130



SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : ET2103890

Client	: AECOM Australia Pty Ltd	Laboratory	: Environmental Division Townsville
Contact	: [REDACTED]	Contact	: [REDACTED]
Address	: [REDACTED]	Address	: 13 Carlton Street, Kirwan Townsville QLD Australia 4815
	BRISBANE		
E-mail	: [REDACTED]	E-mail	: [REDACTED]
Telephone	: [REDACTED]	Telephone	: +61 7 3552 8616
Facsimile	: [REDACTED]	Facsimile	: [REDACTED]
Project	: QLD_0229_PFASOMP_20	Page	: 1 of 5
Order number	: [REDACTED]	Quote number	: ET2021AECOMAU0001 (TV/007/21 - Compass)
C-O-C number	: 26431	QC Level	: NEPM 2013 B3 & ALS QC Standard
Site	: QLD_0229		
Sampler	: [REDACTED]		

Dates

Date Samples Received	: 24-Aug-2021 08:25	Issue Date	: 26-Aug-2021
Client Requested Due Date	: 01-Sep-2021	Scheduled Reporting Date	: 01-Sep-2021

Delivery Details

Mode of Delivery	: Carrier	Security Seal	: Intact.
No. of coolers/boxes	: 4	Temperature	: 1.4><->3.8°C - Ice present
Receipt Detail	: HARD ESKIES	No. of samples received / analysed	: 106 / 106

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
- ***Samples were originally received by ALS Townsville on 20/8/21, and forwarded to ALS Brisbane for analysis.**
- Discounted Package Prices apply only when specific ALS Group Codes ('W', 'S', 'NT' suites) are referenced on COCs.
- Please direct any turn around / technical queries to the laboratory contact designated above.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months ± 1 week) from receipt of samples.
- **Analysis will be conducted by ALS Environmental, Brisbane, NATA accreditation no. 825, Site No. 818 (Micro site no. 18958).**
- 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.
- **Please refer to the Proactive Holding Time Report table below which summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory. The laboratory will process these samples unless instructions are received from you indicating you do not wish to proceed. The absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.**



Sample 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)
ET2103890-003	16-Aug-2021 11:27	0229_SD144_210816	✓	✓
ET2103890-004	16-Aug-2021 11:49	0229_SD110_210816	✓	✓
ET2103890-005	16-Aug-2021 11:58	0229_SD109_210816	✓	✓
ET2103890-007	16-Aug-2021 12:35	0229_SD139_210816	✓	✓
ET2103890-008	16-Aug-2021 13:06	0229_QC101_210816	✓	✓
ET2103890-009	16-Aug-2021 13:07	0229_SD140_210816	✓	✓
ET2103890-013	16-Aug-2021 14:15	0229_SD243_210816	✓	✓
ET2103890-014	16-Aug-2021 14:43	0229_SD242_210816	✓	✓
ET2103890-016	16-Aug-2021 15:17	0229_SD136_210816	✓	✓
ET2103890-018	16-Aug-2021 15:36	0229_SD121_210816	✓	✓
ET2103890-019	16-Aug-2021 16:00	0229_SD133_210816	✓	✓
ET2103890-021	16-Aug-2021 17:02	0229_SD233_210816	✓	✓
ET2103890-022	16-Aug-2021 15:45	0229_SD220_210816	✓	✓
ET2103890-025	16-Aug-2021 15:20	0229_SD232_210816	✓	✓
ET2103890-049	18-Aug-2021 13:33	0229_SD113_210818	✓	✓
ET2103890-052	18-Aug-2021 14:20	0229_SD119_210818	✓	✓
ET2103890-055	18-Aug-2021 14:47	0229_QC107_210818	✓	✓
ET2103890-056	18-Aug-2021 14:47	0229_SD120_210818	✓	✓
ET2103890-058	18-Aug-2021 15:03	0229_SD135_210818	✓	✓
ET2103890-062	18-Aug-2021 15:41	0229_SD134_210818	✓	✓
ET2103890-069	18-Aug-2021 16:03	0229_SD130_210818	✓	✓
ET2103890-076	18-Aug-2021 16:14	0229_SD129_210818	✓	✓
ET2103890-077	18-Aug-2021 16:22	0229_SD128_210818	✓	✓
ET2103890-078	18-Aug-2021 16:32	0229_SD126_210818	✓	✓
ET2103890-080	18-Aug-2021 10:00	0229_SD244_210818	✓	✓
ET2103890-081	18-Aug-2021 10:00	0229_QC102_210818	✓	✓
ET2103890-083	18-Aug-2021 08:20	0229_SD245_210818	✓	✓
ET2103890-086	18-Aug-2021 11:05	0229_SD227_210818	✓	✓
ET2103890-093	19-Aug-2021 08:15	0229_SD205_210819	✓	✓
ET2103890-094	19-Aug-2021 10:40	0229_SD217_210819	✓	✓
ET2103890-098	19-Aug-2021 11:16	0229_SD203_210819	✓	✓



Matrix: **WATER**

Laboratory sample ID	Sampling date / time	Sample ID	WATER - EP231X PFAS - Full Suite (28 analytes)
ET2103890-001	16-Aug-2021 11:12	0229_QC500_210816	✓
ET2103890-002	16-Aug-2021 11:27	0229_SW144_210816	✓
ET2103890-006	16-Aug-2021 12:34	0229_SW139_210816	✓
ET2103890-010	16-Aug-2021 13:08	0229_QC100_210816	✓
ET2103890-011	16-Aug-2021 13:08	0229_SW140_210816	✓
ET2103890-012	16-Aug-2021 14:14	0229_SW243_210816	✓
ET2103890-015	16-Aug-2021 14:44	0229_SW242_210816	✓
ET2103890-017	16-Aug-2021 15:35	0229_SW121_210816	✓
ET2103890-020	16-Aug-2021 17:01	0229_SW233_210816	✓
ET2103890-023	16-Aug-2021 15:45	0229_SW220_210816	✓
ET2103890-024	16-Aug-2021 15:20	0229_SW232_210816	✓
ET2103890-026	16-Aug-2021 18:10	0229_QC300_210816	✓
ET2103890-027	16-Aug-2021 18:11	0229_QC301_210816	✓
ET2103890-028	17-Aug-2021 09:10	0229_MW119_210817	✓
ET2103890-029	17-Aug-2021 11:04	0229_MW125L_210817	✓
ET2103890-030	17-Aug-2021 11:19	0229_MW125S_210817	✓
ET2103890-031	17-Aug-2021 11:50	0229_MW124_210817	✓
ET2103890-032	18-Aug-2021 08:43	0229_MW116_210818	✓
ET2103890-033	17-Aug-2021 13:29	0229_MW141_210817	✓
ET2103890-034	18-Aug-2021 09:00	0229_MW115_210818	✓
ET2103890-035	17-Aug-2021 15:34	0229_MW117S_210817	✓
ET2103890-036	17-Aug-2021 15:47	0229_MW117D_210817	✓
ET2103890-037	17-Aug-2021 17:20	0229_QC302_210817	✓
ET2103890-038	18-Aug-2021 09:41	0229_MW135_210818	✓
ET2103890-039	18-Aug-2021 10:08	0229_MW018_210818	✓
ET2103890-040	18-Aug-2021 10:09	0229_QC104_210818	✓
ET2103890-041	18-Aug-2021 10:32	0229_MW114_210818	✓
ET2103890-042	18-Aug-2021 10:58	0229_MW128_210818	✓
ET2103890-043	18-Aug-2021 11:56	0229_MW105_210818	✓
ET2103890-044	18-Aug-2021 11:56	0229_QC105_210818	✓
ET2103890-045	18-Aug-2021 12:24	0229_MW101_210818	✓
ET2103890-046	18-Aug-2021 12:24	0229_QC106_210818	✓
ET2103890-047	18-Aug-2021 13:26	0229_MW102_210818	✓
ET2103890-048	18-Aug-2021 13:26	0229_MW106_210818	✓
ET2103890-050	17-Aug-2021 15:20	0229_MW118_210817	✓
ET2103890-051	18-Aug-2021 14:02	0229_MW138_210818	✓
ET2103890-053	18-Aug-2021 14:20	0229_SW119_210818	✓
ET2103890-054	18-Aug-2021 14:36	0229_MW220S_210818	✓
ET2103890-057	18-Aug-2021 15:02	0229_SW135_210818	✓
ET2103890-059	18-Aug-2021 15:07	0229_MW233_210818	✓
ET2103890-060	18-Aug-2021 15:33	0229_MW212_210818	✓



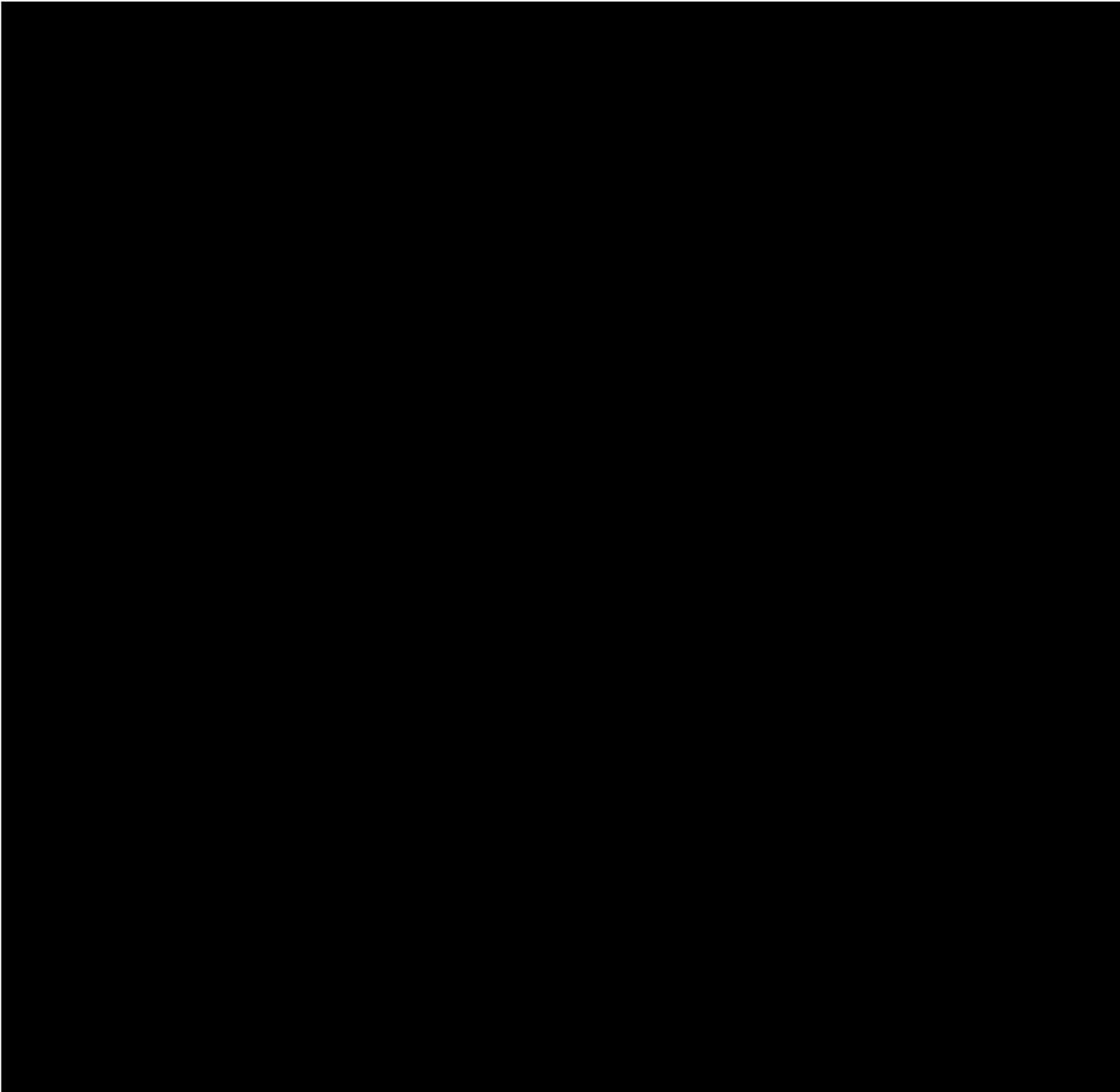
				WATER - EP231X PFAS - Full Suite (28 analytes)
ET2103890-061	18-Aug-2021 15:40	0229_SW134_210818		✓
ET2103890-063	18-Aug-2021 15:57	0229_QC305_210818		✓
ET2103890-064	18-Aug-2021 12:10	0229_MW122_210818		✓
ET2103890-065	18-Aug-2021 15:20	0229_MW217_210818		✓
ET2103890-066	18-Aug-2021 10:35	0229_MW065_210818		✓
ET2103890-067	18-Aug-2021 09:40	0229_MW123I_210818		✓
ET2103890-068	18-Aug-2021 10:15	0229_MW123S_210818		✓
ET2103890-070	18-Aug-2021 13:10	0229_MW121_210818		✓
ET2103890-071	18-Aug-2021 15:50	0229_MW235S_210818		✓
ET2103890-072	18-Aug-2021 14:20	0229_MW139_210818		✓
ET2103890-073	18-Aug-2021 13:45	0229_MW120_210818		✓
ET2103890-074	18-Aug-2021 11:20	0229_MW003_210818		✓
ET2103890-075	18-Aug-2021 16:00	0229_QC306_210818		✓
ET2103890-079	18-Aug-2021 10:12	0229_SW244_210818		✓
ET2103890-082	18-Aug-2021 08:20	0229_SW245_210818		✓
ET2103890-084	18-Aug-2021 10:00	0229_QC103_210818		✓
ET2103890-085	18-Aug-2021 11:05	0229_SW227_210818		✓
ET2103890-087	18-Aug-2021 17:40	0229_QC307_210818		✓
ET2103890-088	19-Aug-2021 08:54	0229_MW236S_210819		✓
ET2103890-089	19-Aug-2021 09:30	0229_MW131_210819		✓
ET2103890-090	19-Aug-2021 09:31	0229_QC108_210819		✓
ET2103890-091	19-Aug-2021 10:01	0229_MW074_210819		✓
ET2103890-092	19-Aug-2021 10:30	0229_MW002_210819		✓
ET2103890-095	19-Aug-2021 08:35	0229_MW205S_210819		✓
ET2103890-096	19-Aug-2021 10:40	0229_SW217_210819		✓
ET2103890-097	19-Aug-2021 08:15	0229_SW205_210819		✓
ET2103890-099	19-Aug-2021 11:16	0229_SW203_210819		✓
ET2103890-100	19-Aug-2021 11:25	0229_QC308_210819		✓
ET2103890-101	19-Aug-2021 11:25	0229_QC309_210819		✓
ET2103890-102	18-Aug-2021 12:30	0229_QC303_210818		✓
ET2103890-103	18-Aug-2021 12:30	0229_QC304_210818		✓
ET2103890-104	20-Aug-2021 11:18	0229_MW232_210820		✓
ET2103890-105	20-Aug-2021 11:39	0229_MW072_210820		✓
ET2103890-106	20-Aug-2021 11:47	0229_QC310_210820		✓

Proactive Holding Time Report

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



Requested Deliverables



CERTIFICATE OF ANALYSIS

Work Order : **ET2103889**
Client : **AECOM Australia Pty Ltd**
Contact : [REDACTED]
Address :
 BRISBANE
Telephone : ----
Project : QLD_0229_PFASOMP_20
Order number : 60612487_3.1
C-O-C number : 26578
Sampler : [REDACTED]
Site : QLD_0229
Quote number : TV/007/21 - Compass
No. of samples received : 1
No. of samples analysed : 1

Page : 1 of 5
Laboratory : Environmental Division Townsville
Contact : [REDACTED]
Address : 13 Carlton Street, Kirwan Townsville QLD Australia 4815
Telephone : +61 7 3552 8616
Date Samples Received : 24-Aug-2021 08:25
Date Analysis Commenced : 26-Aug-2021
Issue Date : 27-Aug-2021 17:21



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

Senior Organic Chemist - PFAS

Brisbane Organics, Stafford, QLD



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 Contact 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.
- 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.
- EP231: Stable isotope enriched internal standards are added to samples prior to extraction. Target compounds have a direct analogous internal standard with the exception of PFPeS, PFHpA, PFDS, PFTrDA and 10:2 FTS. These compounds use an internal standard that is chemically related and has a retention time close to that of the target compound. The DQO for internal standard response is 50-150% of that established at initial calibration. PFOS is quantified using a certified, traceable standard consisting of linear and branched PFOS isomers. These practices are in line with recommendations in the National Environmental Management Plan for PFAS (Australian HEPA) and also conform to QSM 5.3 (US DoD) requirements.



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)		Sample ID		0229_MW226_210819	----	----	----	----
Sampling date / time		19-Aug-2021 07:34		----	----	----	----	----
Compound	CAS Number	LOR	Unit	ET2103889-001	-----	-----	-----	-----
				Result	----	----	----	----
EP231A: Perfluoroalkyl Sulfonic Acids								
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	0.15	----	----	----	----
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	0.07	----	----	----	----
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.02	µg/L	0.43	----	----	----	----
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	----	----	----	----
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	0.11	----	----	----	----
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	0.08	----	----	----	----
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	----	----	----	----



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)		Sample ID	0229_MW226_210819	----	----	----	----
		Sampling date / time	19-Aug-2021 07:34	----	----	----	----
Compound	CAS Number	LOR	Unit	ET2103889-001	-----	-----	-----
				Result	----	----	----
EP231C: Perfluoroalkyl Sulfonamides - Continued							
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	0.86	----	----	----
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	0.54	----	----	----
Sum of PFAS (WA DER List)	----	0.01	µg/L	0.79	----	----	----
EP231S: PFAS Surrogate							
13C4-PFOS	----	0.02	%	82.7	----	----	----
13C8-PFOA	----	0.02	%	95.8	----	----	----



Surrogate Control Limits

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

Inter-Laboratory Testing

Analysis conducted by ALS Brisbane, NATA accreditation no. 825, site no. 818 (Chemistry) 18958 (Biology).

(WATER) EP231A: Perfluoroalkyl Sulfonic Acids

(WATER) EP231B: Perfluoroalkyl Carboxylic Acids

(WATER) EP231C: Perfluoroalkyl Sulfonamides

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

(WATER) EP231P: PFAS Sums

(WATER) EP231S: PFAS Surrogate

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: ET2103889	Page	: 1 of 4
Client	: AECOM Australia Pty Ltd	Laboratory	: Environmental Division Townsville
Contact	: [REDACTED]	Telephone	: [REDACTED]
Project	: QLD_0229_PFASOMP_20	Date Samples Received	: 24-Aug-2021
Site	: QLD_0229	Issue Date	: 27-Aug-2021
Sampler	: [REDACTED]	No. of samples received	: 1
Order number	: 60612487_3.1	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.
- 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							
EP231B: Perfluoroalkyl Carboxylic Acids	EB2123968--007	Anonymous	Perfluoropentanoic acid (PFPeA)	2706-90-3	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
EP231A: Perfluoroalkyl Sulfonic Acids							
HDPE (no PTFE) (EP231X) 0229_MW226_210819	19-Aug-2021	26-Aug-2021	15-Feb-2022	✔	26-Aug-2021	15-Feb-2022	✔
EP231B: Perfluoroalkyl Carboxylic Acids							
HDPE (no PTFE) (EP231X) 0229_MW226_210819	19-Aug-2021	26-Aug-2021	15-Feb-2022	✔	26-Aug-2021	15-Feb-2022	✔
EP231C: Perfluoroalkyl Sulfonamides							
HDPE (no PTFE) (EP231X) 0229_MW226_210819	19-Aug-2021	26-Aug-2021	15-Feb-2022	✔	26-Aug-2021	15-Feb-2022	✔
EP231D: (n:2) Fluorotelomer Sulfonic Acids							
HDPE (no PTFE) (EP231X) 0229_MW226_210819	19-Aug-2021	26-Aug-2021	15-Feb-2022	✔	26-Aug-2021	15-Feb-2022	✔
EP231P: PFAS Sums							
HDPE (no PTFE) (EP231X) 0229_MW226_210819	19-Aug-2021	26-Aug-2021	15-Feb-2022	✔	26-Aug-2021	15-Feb-2022	✔



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	Method	Count		Rate (%)			Quality Control Specification
		QC	Regular	Actual	Expected	Evaluation	
Analytical Methods							
Laboratory Duplicates (DUP)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	12	16.67	10.00	✔	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	12	8.33	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	12	8.33	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	12	8.33	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.

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

QUALITY CONTROL REPORT

Work Order : ET2103889 Client : AECOM Australia Pty Ltd Contact : [REDACTED] Address : BRISBANE Telephone : ---- Project : QLD_0229_PFASOMP_20 Order number : 60612487_3.1 C-O-C number : 26578 Sampler : [REDACTED] Site : QLD_0229 Quote number : TV/007/21 - Compass No. of samples received : 1 No. of samples analysed : 1	Page : 1 of 7 Laboratory : Environmental Division Townsville Contact : [REDACTED] Address : 13 Carlton Street, Kirwan Townsville QLD Australia 4815 Telephone : [REDACTED] Date Samples Received : 24-Aug-2021 Date Analysis Commenced : 26-Aug-2021 Issue Date : 27-Aug-2021
---	--



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.

<i>Signatories</i>	<i>Position</i>	<i>Accreditation Category</i>
[REDACTED]	Senior Organic Chemist - PFAS	Brisbane Organics, Stafford, QLD



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: 3866184)									
EB2123968-002	Anonymous	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: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	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
EB2123968-017	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: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	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: 3866184)									
EB2123968-002	Anonymous	EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	0.70	0.74	4.5	0% - 20%
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	3.32	3.33	0.0	0% - 20%
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	2.52	2.54	0.6	0% - 20%
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	1.20	1.22	1.7	0% - 20%
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	0.10	0.09	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	0.03	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	<0.06	<0.06	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	0.6	0.7	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: 3866184) - continued									
EB2123968-017	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: 3866184)									
EB2123968-002	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	<0.06	<0.06	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.06	<0.06	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.06	<0.06	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.06	<0.06	0.0	No Limit
EB2123968-017	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: 3866184)									
EB2123968-002	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: 3866184) - continued									
EB2123968-002	Anonymous	EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	7.81	8.22	5.1	0% - 20%
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	1.05	1.23	15.8	0% - 20%
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EB2123968-017	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: 3866184)									
EB2123968-002	Anonymous	EP231X: Sum of PFAS	----	0.01	µg/L	17.4	18.1	4.3	0% - 20%
		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	17.2	18.0	4.4	0% - 20%
EB2123968-017	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: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
				Result	Spike Concentration	Spike Recovery (%)	Acceptable Limits (%)	
						LCS	Low	High
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 3866184)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.2218 µg/L	125	72.0	130
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.2352 µg/L	124	71.0	127
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.02	µg/L	<0.02	0.2373 µg/L	116	68.0	131
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.238 µg/L	110	69.0	134
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.232 µg/L	110	65.0	140
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.241 µg/L	112	53.0	142
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 3866184)								
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	113	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	118	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	119	69.0	130
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	0.25 µg/L	115	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	115	72.0	134
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	0.25 µg/L	109	65.0	144
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	0.625 µg/L	104	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 3866184)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.25 µg/L	109	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	0.625 µg/L	130	68.0	141
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	0.625 µg/L	112	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	113	62.6	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	106	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 3866184)								
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	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	112	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 (%)	Acceptable Limits (%)	
						LCS	Low	High
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 3866184) - continued								
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: 3866184)								
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	Spike Recovery(%)	Acceptable Limits (%)		
					MS	Low	High	
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 3866184)								
EB2123968-007	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.2218 µg/L	124	72.0	130	
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.235 µg/L	114	71.0	127	
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.2352 µg/L	118	68.0	131	
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.238 µg/L	115	69.0	134	
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.232 µg/L	120	65.0	140	
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.241 µg/L	128	53.0	142	
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 3866184)								
EB2123968-007	Anonymous	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	1.25 µg/L	79.6	73.0	129	
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.25 µg/L	# Not Determined	72.0	129	
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.25 µg/L	120	72.0	129	
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.25 µg/L	130	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	115	69.0	130	
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.25 µg/L	113	71.0	129	
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.25 µg/L	115	69.0	133	
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.25 µg/L	116	72.0	134	
		EP231X: Perfluorotridecanoic acid (PFTTrDA)	72629-94-8	0.25 µg/L	129	65.0	144	
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.625 µg/L	111	71.0	132	
		EP231C: Perfluoroalkyl Sulfonamides (QCLot: 3866184)						
		EB2123968-007	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.25 µg/L	118	59.0
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8			0.625 µg/L	121	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: 3866184) - continued							
EB2123968-007	Anonymous	EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.625 µg/L	106	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.625 µg/L	115	70.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.625 µg/L	127	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.25 µg/L	116	65.0	136
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.25 µg/L	112	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 3866184)							
EB2123968-007	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.234 µg/L	102	63.0	143
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.2378 µg/L	132	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.24 µg/L	118	67.0	138
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.2415 µg/L	119	70.0	130



SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : ET2103889

Client : AECOM Australia Pty Ltd
Contact : [REDACTED]
Address : BRISBANE

Laboratory : Environmental Division Townsville
Contact : [REDACTED]
Address : 13 Carlton Street, Kirwan Townsville
QLD Australia 4815

E-mail : [REDACTED]
Telephone : [REDACTED]
Facsimile : [REDACTED]

E-mail : [REDACTED]
Telephone : [REDACTED]
Facsimile : [REDACTED]

Project : QLD_0229_PFASOMP_20
Order number :

Page : 1 of 3
Quote number : ET2021AECOMAU0001 (TV/007/21 -
Compass)

C-O-C number : 26578

QC Level : NEPM 2013 B3 & ALS QC Standard

Site : QLD 0229

Sampler : [REDACTED]

Dates

Date Samples Received : 24-Aug-2021 08:25
Client Requested Due : 30-Aug-2021
Date

Issue Date : 25-Aug-2021
Scheduled Reporting Date : 30-Aug-2021

Delivery Details

Mode of Delivery : Carrier
No. of coolers/boxes : 4
Receipt Detail : HARD ESKIES

Security Seal : Intact.
Temperature : 1.4<->3.8°C - Ice present
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
- ***Samples were originally received by ALS Townsville on 20/8/21, and forwarded to ALS Brisbane for analysis.**
- Discounted Package Prices apply only when specific ALS Group Codes ('W', 'S', 'NT' suites) are referenced on COCs.
- Please direct any turn around / technical queries to the laboratory contact designated above.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months ± 1 week) from receipt of samples.
- Analysis will be conducted by ALS Environmental, Brisbane, NATA accreditation no. 825, Site No. 818 (Micro site no. 18958).
- 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.
- **Please refer to the Proactive Holding Time Report table below which summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory. The laboratory will process these samples unless instructions are received from you indicating you do not wish to proceed. The absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.**



Sample 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**

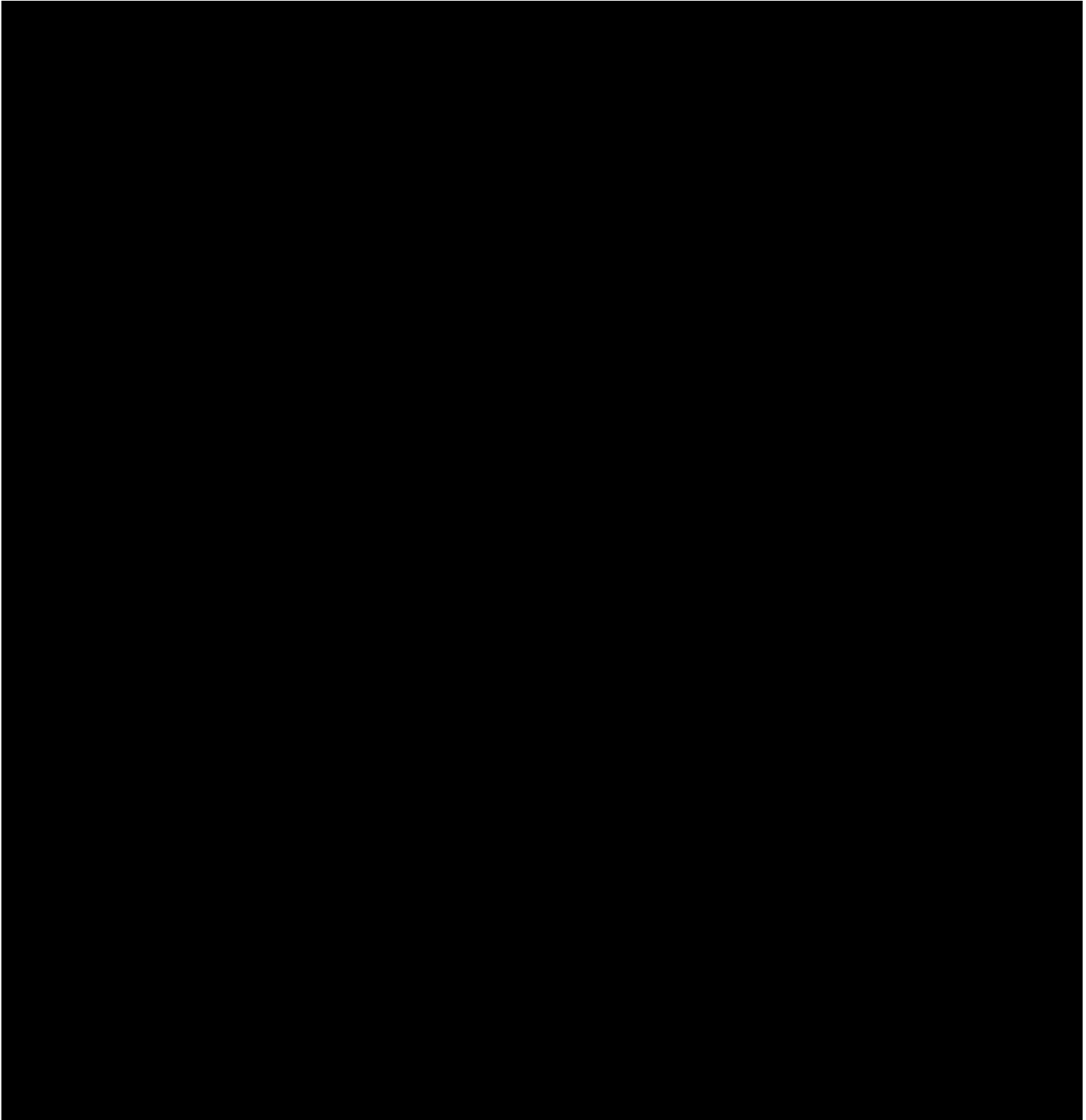
Laboratory sample ID	Sampling date / time	Sample ID	WATER - EP231X PFAS - Full Suite (28 analytes)
ET2103889-001	19-Aug-2021 07:34	0229_MW226_210819	✓

Proactive Holding Time Report

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



Requested Deliverables





CERTIFICATE OF ANALYSIS

Work Order : ET2103923
Client : AECOM Australia Pty Ltd
Contact : [Redacted]
Address : [Redacted] BRISBANE
Telephone : ----
Project : QLD_0229_PFASOMP_20
Order number : 60612487_3.1
C-O-C number : 26598
Sampler : [Redacted]
Site : QLD_0229
Quote number : TV/007/21 - Compass
No. of samples received : 4
No. of samples analysed : 4

Page : 1 of 7
Laboratory : Environmental Division Townsville
Contact : [Redacted]
Address : 13 Carlton Street, Kirwan Townsville QLD Australia 4815
Telephone : [Redacted]
Date Samples Received : 24-Aug-2021 08:25
Date Analysis Commenced : 26-Aug-2021
Issue Date : 30-Aug-2021 14:57



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.

Table with 3 columns: Signatories, Position, Accreditation Category. Row 1: [Redacted], Senior Inorganic Chemist, Brisbane Inorganics, Stafford, QLD. Row 2: [Redacted], Assistant Laboratory Manager, Brisbane Organics, Stafford, QLD.



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 Contact 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.
- 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.
- 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		0229_SD211_210819	0229_SD212_210819	----	----	----
		Sampling date / time		19-Aug-2021 09:50	19-Aug-2021 09:30	----	----	----
Compound	CAS Number	LOR	Unit	ET2103923-003	ET2103923-004	-----	-----	-----
				Result	Result	----	----	----
EA055: Moisture Content (Dried @ 105-110°C)								
Moisture Content	----	0.1	%	32.0	31.6	----	----	----
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	0.0005	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	----	----	----
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	<0.0005	----	----	----



Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)				Sample ID	0229_SD211_210819	0229_SD212_210819	----	----	----
Sampling date / time				19-Aug-2021 09:50	19-Aug-2021 09:30	----	----	----	
Compound	CAS Number	LOR	Unit	ET2103923-003	ET2103923-004	-----	-----	-----	
				Result	Result	----	----	----	
EP231C: Perfluoroalkyl Sulfonamides - Continued									
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	0.0005	0.0002	----	----	----	
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg	0.0005	0.0002	----	----	----	
Sum of PFAS (WA DER List)	----	0.0002	mg/kg	0.0005	0.0002	----	----	----	
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.0002	%	94.0	93.5	----	----	----	
13C8-PFOA	----	0.0002	%	96.5	96.5	----	----	----	



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	0229_SW211_210819	0229_SW212_210819	----	----	----
Sampling date / time				19-Aug-2021 09:50	19-Aug-2021 09:30	----	----	----	
Compound	CAS Number	LOR	Unit	ET2103923-001	ET2103923-002	-----	-----	-----	
				Result	Result	----	----	----	
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.08	----	----	----	
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	<0.02	----	----	----	
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.02	µg/L	<0.02	0.04	----	----	----	
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	0.07	----	----	----	
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	0.02	----	----	----	
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	----	----	----	



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	0229_SW211_210819	0229_SW212_210819	----	----	----
Sampling date / time				19-Aug-2021 09:50	19-Aug-2021 09:30	----	----	----	
Compound	CAS Number	LOR	Unit	ET2103923-001	ET2103923-002	-----	-----	-----	
				Result	Result	----	----	----	
EP231C: Perfluoroalkyl Sulfonamides - Continued									
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	0.21	----	----	----	
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	<0.01	0.11	----	----	----	
Sum of PFAS (WA DER List)	----	0.01	µg/L	<0.01	0.21	----	----	----	
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%	101	90.9	----	----	----	
13C8-PFOA	----	0.02	%	99.9	95.0	----	----	----	



Surrogate Control Limits

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

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

Inter-Laboratory Testing

Analysis conducted by ALS Brisbane, NATA accreditation no. 825, site no. 818 (Chemistry) 18958 (Biology).

- (WATER) EP231A: Perfluoroalkyl Sulfonic Acids
- (WATER) EP231B: Perfluoroalkyl Carboxylic Acids
- (WATER) EP231C: Perfluoroalkyl Sulfonamides
- (WATER) EP231D: (n:2) Fluorotelomer Sulfonic Acids
- (WATER) EP231P: PFAS Sums
- (WATER) EP231S: PFAS Surrogate
- (SOIL) EP231B: Perfluoroalkyl Carboxylic Acids
- (SOIL) EP231D: (n:2) Fluorotelomer Sulfonic Acids
- (SOIL) EP231C: Perfluoroalkyl Sulfonamides
- (SOIL) EP231A: Perfluoroalkyl Sulfonic Acids
- (SOIL) EP231P: PFAS Sums
- (SOIL) EP231S: PFAS Surrogate
- (SOIL) EA055: Moisture Content (Dried @ 105-110°C)

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: ET2103923	Page	: 1 of 5
Client	: AECOM Australia Pty Ltd	Laboratory	: Environmental Division Townsville
Contact	[REDACTED]	Telephone	[REDACTED]
Project	: QLD_0229_PFASOMP_20	Date Samples Received	: 24-Aug-2021
Site	: QLD_0229	Issue Date	: 30-Aug-2021
Sampler	[REDACTED]	No. of samples received	: 4
Order number	: 60612487_3.1	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							
EP231B: Perfluoroalkyl Carboxylic Acids	EB2123968--007	Anonymous	Perfluoropentanoic acid (PFPeA)	2706-90-3	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) 0229_SD211_210819,	0229_SD212_210819	19-Aug-2021	----	----	----	26-Aug-2021	02-Sep-2021	✓
EP231A: Perfluoroalkyl Sulfonic Acids								
HDPE Soil Jar (EP231X) 0229_SD211_210819,	0229_SD212_210819	19-Aug-2021	26-Aug-2021	15-Feb-2022	✓	27-Aug-2021	05-Oct-2021	✓
EP231B: Perfluoroalkyl Carboxylic Acids								
HDPE Soil Jar (EP231X) 0229_SD211_210819,	0229_SD212_210819	19-Aug-2021	26-Aug-2021	15-Feb-2022	✓	27-Aug-2021	05-Oct-2021	✓
EP231C: Perfluoroalkyl Sulfonamides								
HDPE Soil Jar (EP231X) 0229_SD211_210819,	0229_SD212_210819	19-Aug-2021	26-Aug-2021	15-Feb-2022	✓	27-Aug-2021	05-Oct-2021	✓
EP231D: (n:2) Fluorotelomer Sulfonic Acids								
HDPE Soil Jar (EP231X) 0229_SD211_210819,	0229_SD212_210819	19-Aug-2021	26-Aug-2021	15-Feb-2022	✓	27-Aug-2021	05-Oct-2021	✓
EP231P: PFAS Sums								
HDPE Soil Jar (EP231X) 0229_SD211_210819,	0229_SD212_210819	19-Aug-2021	26-Aug-2021	15-Feb-2022	✓	27-Aug-2021	05-Oct-2021	✓

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
EP231A: Perfluoroalkyl Sulfonic Acids							
HDPE (no PTFE) (EP231X) 0229_SW212_210819	19-Aug-2021	26-Aug-2021	15-Feb-2022	✓	26-Aug-2021	15-Feb-2022	✓
HDPE (no PTFE) (EP231X) 0229_SW211_210819	19-Aug-2021	26-Aug-2021	15-Feb-2022	✓	27-Aug-2021	15-Feb-2022	✓
EP231B: Perfluoroalkyl Carboxylic Acids							
HDPE (no PTFE) (EP231X) 0229_SW212_210819	19-Aug-2021	26-Aug-2021	15-Feb-2022	✓	26-Aug-2021	15-Feb-2022	✓
HDPE (no PTFE) (EP231X) 0229_SW211_210819	19-Aug-2021	26-Aug-2021	15-Feb-2022	✓	27-Aug-2021	15-Feb-2022	✓
EP231C: Perfluoroalkyl Sulfonamides							
HDPE (no PTFE) (EP231X) 0229_SW212_210819	19-Aug-2021	26-Aug-2021	15-Feb-2022	✓	26-Aug-2021	15-Feb-2022	✓
HDPE (no PTFE) (EP231X) 0229_SW211_210819	19-Aug-2021	26-Aug-2021	15-Feb-2022	✓	27-Aug-2021	15-Feb-2022	✓
EP231D: (n:2) Fluorotelomer Sulfonic Acids							
HDPE (no PTFE) (EP231X) 0229_SW212_210819	19-Aug-2021	26-Aug-2021	15-Feb-2022	✓	26-Aug-2021	15-Feb-2022	✓
HDPE (no PTFE) (EP231X) 0229_SW211_210819	19-Aug-2021	26-Aug-2021	15-Feb-2022	✓	27-Aug-2021	15-Feb-2022	✓
EP231P: PFAS Sums							
HDPE (no PTFE) (EP231X) 0229_SW212_210819	19-Aug-2021	26-Aug-2021	15-Feb-2022	✓	26-Aug-2021	15-Feb-2022	✓
HDPE (no PTFE) (EP231X) 0229_SW211_210819	19-Aug-2021	26-Aug-2021	15-Feb-2022	✓	27-Aug-2021	15-Feb-2022	✓



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	Method	Count		Rate (%)			Quality Control Specification
		QC	Regular	Actual	Expected	Evaluation	
Analytical Methods							
Laboratory Duplicates (DUP)							
Moisture Content	EA055	1	2	50.00	10.00	✔	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	2	50.00	10.00	✔	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	2	50.00	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	2	50.00	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	2	50.00	5.00	✔	NEPM 2013 B3 & ALS QC Standard

Matrix: WATER

Evaluation: ✖ = Quality Control frequency not within specification ; ✔ = Quality Control frequency within specification.

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



Brief Method Summaries

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

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

QUALITY CONTROL REPORT

Work Order	: ET2103923	Page	: 1 of 11
Client	: AECOM Australia Pty Ltd	Laboratory	: Environmental Division Townsville
Contact	: [REDACTED]	Contact	: [REDACTED]
Address	: [REDACTED]	Address	: 13 Carlton Street, Kirwan Townsville QLD Australia 4815
	: BRISBANE	Telephone	: [REDACTED]
Telephone	: ----	Date Samples Received	: 24-Aug-2021
Project	: QLD_0229_PFASOMP_20	Date Analysis Commenced	: 26-Aug-2021
Order number	: 60612487_3.1	Issue Date	: 30-Aug-2021
C-O-C number	: 26598		
Sampler	: [REDACTED]		
Site	: QLD_0229		
Quote number	: TV/007/21 - Compass		
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 Inorganic Chemist	Brisbane Inorganics, Stafford, QLD
[REDACTED]	Assistant Laboratory Manager	Brisbane Organics, Stafford, QLD



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: 3868042)									
ET2103923-003	0229_SD211_210819	EA055: Moisture Content	----	0.1	%	32.0	31.1	2.7	0% - 20%
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 3868041)									
ET2103923-003	0229_SD211_210819	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	0.0002	63.8	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: 3868041)									
ET2103923-003	0229_SD211_210819	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: 3868041)							
ET2103923-003	0229_SD211_210819	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	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 (%)
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 3868041) - continued									
ET2103923-003	0229_SD211_210819	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: 3868041)									
ET2103923-003	0229_SD211_210819	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: 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: 3866184)									
EB2123968-002	Anonymous	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: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	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
EB2123968-017	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: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	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: 3866184)									
EB2123968-002	Anonymous	EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	0.70	0.74	4.5	0% - 20%
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	3.32	3.33	0.0	0% - 20%
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	2.52	2.54	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 (%)
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 3866184) - continued									
EB2123968-002	Anonymous	EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	1.20	1.22	1.7	0% - 20%
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	0.10	0.09	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	0.03	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	<0.06	<0.06	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	0.6	0.7	0.0	No Limit
EB2123968-017	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: 3866184)							
EB2123968-002	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	<0.06	<0.06	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.06	<0.06	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.06	<0.06	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.06	<0.06	0.0	No Limit
EB2123968-017	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 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: 3866184) - continued									
EB2123968-017	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
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 3866184)									
EB2123968-002	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	7.81	8.22	5.1	0% - 20%
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	1.05	1.23	15.8	0% - 20%
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EB2123968-017	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: 3866184)									
EB2123968-002	Anonymous	EP231X: Sum of PFAS	----	0.01	µg/L	17.4	18.1	4.3	0% - 20%
		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	17.2	18.0	4.4	0% - 20%
EB2123968-017	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: **SOIL**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report				
				Result	Spike Concentration	Spike Recovery (%)		Acceptable Limits (%)	
						LCS	Low	High	
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 3868041)									
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	0.0011 mg/kg	90.4	72.0	128	
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	0.00117 mg/kg	95.3	73.0	123	
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	0.00118 mg/kg	95.3	67.0	130	
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	0.00119 mg/kg	97.9	70.0	132	
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	0.00116 mg/kg	84.5	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: 3868041)									
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	0.00625 mg/kg	93.7	71.0	135	
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	0.00125 mg/kg	90.4	69.0	132	
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	0.00125 mg/kg	94.8	70.0	132	
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	0.00125 mg/kg	82.4	71.0	131	
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	100	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	96.0	69.0	133	
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	97.2	64.0	136	
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	94.8	69.0	135	
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	93.6	66.0	139	
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	0.00312 mg/kg	97.3	69.0	133	
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 3868041)									
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	0.00125 mg/kg	98.8	67.0	137	
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	0.00312 mg/kg	90.2	59.6	143	
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	0.00312 mg/kg	94.6	62.8	140	
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	0.00312 mg/kg	97.9	61.5	139	
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	0.00312 mg/kg	89.3	61.9	137	
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	0.00125 mg/kg	94.4	63.0	144	
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	0.00125 mg/kg	100	61.0	139	
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 3868041)									
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	0.00117 mg/kg	90.6	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	102	65.0	137	



Sub-Matrix: **SOIL**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report Result	Laboratory Control Spike (LCS) Report				
					Spike Concentration	Spike Recovery (%)		Acceptable Limits (%)	
						LCS	Low	High	
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 3868041) - continued									
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	0.0012 mg/kg	96.7	54.8	124	

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report Result	Laboratory Control Spike (LCS) Report				
					Spike Concentration	Spike Recovery (%)		Acceptable Limits (%)	
						LCS	Low	High	
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 3866184)									
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.2218 µg/L	125	72.0	130	
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.2352 µg/L	124	71.0	127	
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.02	µg/L	<0.02	0.2373 µg/L	116	68.0	131	
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.238 µg/L	110	69.0	134	
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.232 µg/L	110	65.0	140	
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.241 µg/L	112	53.0	142	
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 3867926)									
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.2218 µg/L	72.6	72.0	130	
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.2352 µg/L	74.2	71.0	127	
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.02	µg/L	<0.02	0.2373 µg/L	76.0	68.0	131	
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.238 µg/L	75.1	69.0	134	
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.232 µg/L	70.6	65.0	140	
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.241 µg/L	72.7	53.0	142	
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 3866184)									
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	113	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	118	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	119	69.0	130	
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	0.25 µg/L	115	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	115	72.0	134	
EP231X: Perfluorotridecanoic acid (PFTTrDA)	72629-94-8	0.02	µg/L	<0.02	0.25 µg/L	109	65.0	144	
EP231X: Perfluorotetradecanoic acid (PFTTeDA)	376-06-7	0.05	µg/L	<0.05	0.625 µg/L	104	71.0	132	
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 3867926)									
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	1.25 µg/L	85.4	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	72.4	72.0	129	
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	0.25 µg/L	73.3	72.0	130	
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	0.25 µg/L	80.0	71.0	133	
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	0.25 µg/L	70.5	69.0	130	
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	0.25 µg/L	73.0	71.0	129	



Sub-Matrix: WATER

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report Result	Laboratory Control Spike (LCS) Report				
					Spike Concentration	Spike Recovery (%)		Acceptable Limits (%)	
						LCS	Low	High	High
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 3867926) - continued									
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	0.25 µg/L	76.4	69.0	133	
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	0.25 µg/L	75.1	72.0	134	
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	0.25 µg/L	70.6	65.0	144	
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	0.625 µg/L	71.6	71.0	132	
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 3866184)									
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.25 µg/L	109	67.0	137	
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	0.625 µg/L	130	68.0	141	
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	0.625 µg/L	112	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	113	62.6	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	106	61.0	135	
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 3867926)									
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.25 µg/L	73.4	67.0	137	
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	0.625 µg/L	70.1	68.0	141	
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	0.625 µg/L	72.6	60.5	138	
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	0.625 µg/L	72.4	68.3	134	
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	0.625 µg/L	78.6	62.6	138	
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	0.25 µg/L	87.5	65.0	136	
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	0.25 µg/L	66.6	61.0	135	
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 3866184)									
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	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	112	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: 3867926)									
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.2343 µg/L	71.3	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	75.6	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	92.1	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	70.1	64.2	133	
EP231P: PFAS Sums (QCLot: 3866184)									



Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report Result	Laboratory Control Spike (LCS) Report			
					Spike Concentration	Spike Recovery (%)	Acceptable Limits (%)	
						LCS	Low	High
EP231P: PFAS Sums (QCLot: 3866184) - continued								
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: 3867926)								
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: **SOIL**

Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report			
				Spike Concentration	Spike Recovery (%) MS	Acceptable Limits (%) Low High	
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 3868041)							
ET2103923-004	0229_SD212_210819	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.00117 mg/kg	100	72.0	128
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.00117 mg/kg	95.7	73.0	123
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.00118 mg/kg	94.1	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	81.5	68.0	136
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0012 mg/kg	102	59.0	134
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 3868041)							
ET2103923-004	0229_SD212_210819	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.00625 mg/kg	103	71.0	135
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.00125 mg/kg	96.8	69.0	132
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.00125 mg/kg	95.2	70.0	132
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.00125 mg/kg	93.2	71.0	131
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.00125 mg/kg	99.2	69.0	133
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.00125 mg/kg	88.0	72.0	129
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.00125 mg/kg	86.4	69.0	133
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.00125 mg/kg	94.8	64.0	136
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.00125 mg/kg	94.4	69.0	135
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.00125 mg/kg	93.6	66.0	139
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.00312 mg/kg	95.8	69.0	133
		EP231C: Perfluoroalkyl Sulfonamides (QCLot: 3868041)					
ET2103923-004	0229_SD212_210819	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.00125 mg/kg	91.2	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: 3868041) - continued							
ET2103923-004	0229_SD212_210819	EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.00312 mg/kg	86.7	70.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.00312 mg/kg	89.6	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.00312 mg/kg	106	70.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.00312 mg/kg	101	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.00125 mg/kg	103	63.0	144
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.00125 mg/kg	94.8	61.0	139
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 3868041)							
ET2103923-004	0229_SD212_210819	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.00117 mg/kg	85.0	62.0	145
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.00118 mg/kg	98.3	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0012 mg/kg	93.3	65.0	137
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0012 mg/kg	86.7	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
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 3866184)							
EB2123968-007	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.2218 µg/L	124	72.0	130
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.235 µg/L	114	71.0	127
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.2352 µg/L	118	68.0	131
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.238 µg/L	115	69.0	134
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.232 µg/L	120	65.0	140
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.241 µg/L	128	53.0	142
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 3866184)							
EB2123968-007	Anonymous	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	1.25 µg/L	79.6	73.0	129
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.25 µg/L	# Not Determined	72.0	129
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.25 µg/L	120	72.0	129
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.25 µg/L	130	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	115	69.0	130
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.25 µg/L	113	71.0	129
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.25 µg/L	115	69.0	133
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.25 µg/L	116	72.0	134
		EP231X: Perfluorotridecanoic acid (PFTTrDA)	72629-94-8	0.25 µg/L	129	65.0	144



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: 3866184) - continued							
EB2123968-007	Anonymous	EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.625 µg/L	111	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 3866184)							
EB2123968-007	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.25 µg/L	118	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	106	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.625 µg/L	115	70.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.625 µg/L	127	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.25 µg/L	116	65.0	136
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.25 µg/L	112	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 3866184)							
EB2123968-007	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.234 µg/L	102	63.0	143
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.2378 µg/L	132	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.24 µg/L	118	67.0	138
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.2415 µg/L	119	70.0	130



SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : ET2103923

Client	: AECOM Australia Pty Ltd	Laboratory	: Environmental Division Townsville
Contact	: [REDACTED]	Contact	: [REDACTED]
Address	: [REDACTED]	Address	: 13 Carlton Street, Kirwan Townsville QLD Australia 4815
	: BRISBANE		
E-mail	: [REDACTED]	E-mail	: [REDACTED]
Telephone	: [REDACTED]	Telephone	: [REDACTED]
Facsimile	: [REDACTED]	Facsimile	: [REDACTED]
Project	: QLD_0229_PFASOMP_20	Page	: 1 of 3
Order number	:	Quote number	: ET2021AECOMAU0001 (TV/007/21 - Compass)
C-O-C number	: 26598	QC Level	: NEPM 2013 B3 & ALS QC Standard
Site	: QLD 0229		
Sampler	: [REDACTED]		

Dates

Date Samples Received	: 24-Aug-2021 08:25	Issue Date	: 26-Aug-2021
Client Requested Due Date	: 30-Aug-2021	Scheduled Reporting Date	: 30-Aug-2021

Delivery Details

Mode of Delivery	: Carrier	Security Seal	: Intact.
No. of coolers/boxes	: 4	Temperature	: 1.4><->3.8°C - Ice present
Receipt Detail	: HARD ESKIES	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
- ***Samples were originally received by ALS Townsville on 20/8/21, and forwarded to ALS Brisbane for analysis.**
- Discounted Package Prices apply only when specific ALS Group Codes ('W', 'S', 'NT' suites) are referenced on COCs.
- Please direct any turn around / technical queries to the laboratory contact designated above.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months ± 1 week) from receipt of samples.
- **Analysis will be conducted by ALS Environmental, Brisbane, NATA accreditation no. 825, Site No. 818 (Micro site no. 18958).**
- 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.
- **Please refer to the Proactive Holding Time Report table below which summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory. The laboratory will process these samples unless instructions are received from you indicating you do not wish to proceed. The absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.**



Sample 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)
ET2103923-003	19-Aug-2021 09:50	0229_SD211_210819	✓	✓
ET2103923-004	19-Aug-2021 09:30	0229_SD212_210819	✓	✓

Matrix: **WATER**

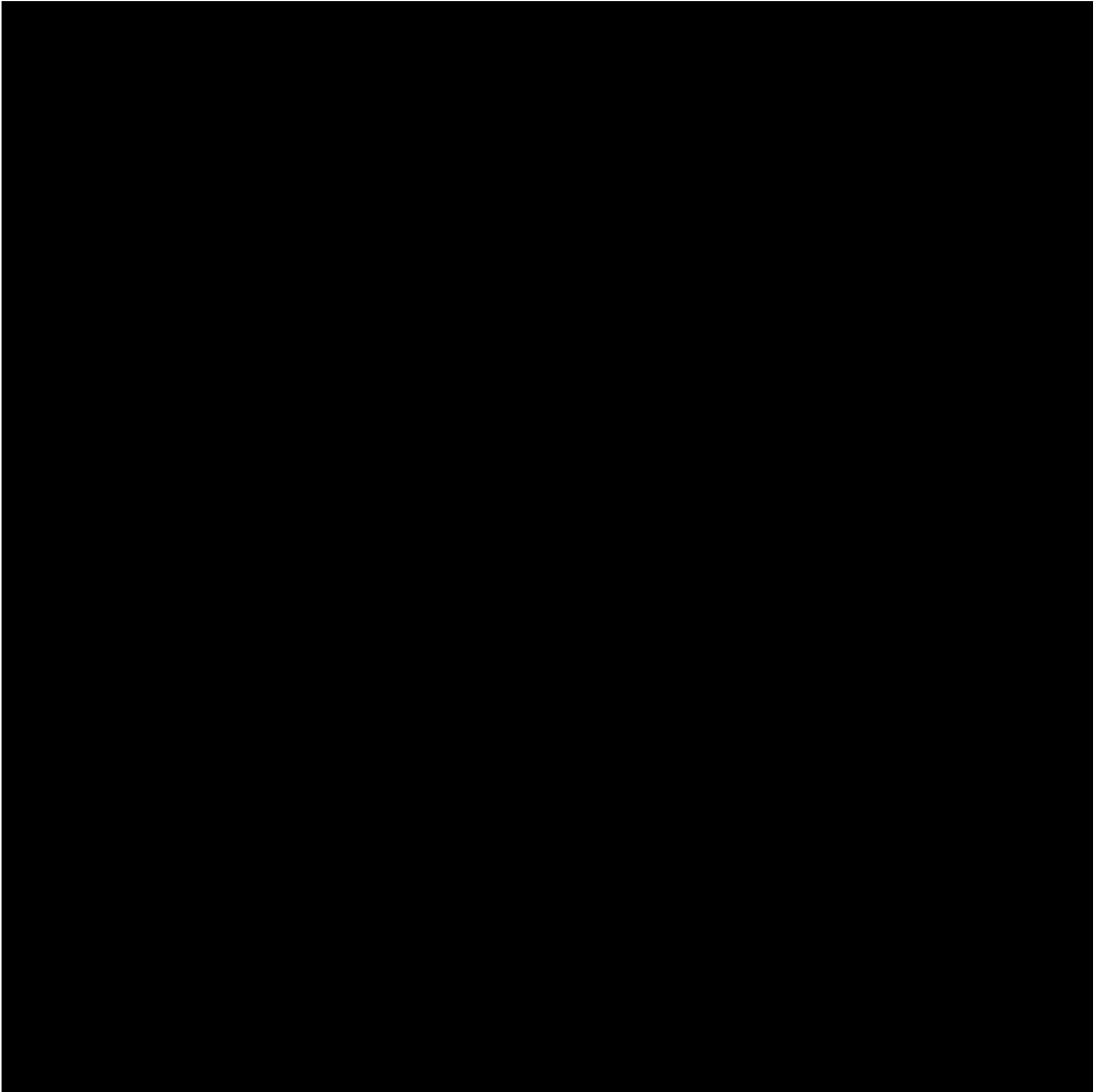
Laboratory sample ID	Sampling date / time	Sample ID	WATER - EP231X PFAS - Full Suite (28 analytes)
ET2103923-001	19-Aug-2021 09:50	0229_SW211_210819	✓
ET2103923-002	19-Aug-2021 09:30	0229_SW212_210819	✓

Proactive Holding Time Report

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



Requested Deliverables





REPORT OF ANALYSIS

Client :	AECOM AUSTRALIA PTY LTD	Job No. :	AECO06/210830
		Quote No. :	QT-02018
Attention :		Order No. :	60612487_3_1
Project Name :	QLD_0229_PFASOMP_20	Date Received :	30-AUG-2021
Your Client Services Manager		Sampled By :	CLIENT
		Phone	

Lab Reg No.	Sample Ref	Sample Description
N21/020200	0229_QC201_210816	SOIL 16/08/21 13:06
N21/020201	0229_QC202_210818	SOIL 18/08/21 10:00
N21/020206	0229_QC207_210818	SOIL 18/08/21 14:47

Lab Reg No.		N21/020200	N21/020201	N21/020206		
Date Sampled		16-AUG-2021	18-AUG-2021	18-AUG-2021		
	Units					Method
PFAS (per-and poly-fluoroalkyl substances)						
PFBA (375-22-4)	mg/kg	<0.002	<0.002	<0.002		NR70
PFPeA (2706-90-3)	mg/kg	<0.002	<0.002	<0.002		NR70
PFHxA (307-24-4)	mg/kg	<0.001	<0.001	<0.001		NR70
PFHpA (375-85-9)	mg/kg	<0.001	<0.001	<0.001		NR70
PFOA (335-67-1)	mg/kg	<0.001	<0.001	<0.001		NR70
PFNA (375-95-1)	mg/kg	<0.001	<0.001	<0.001		NR70
PFDA (335-76-2)	mg/kg	<0.001	<0.001	<0.001		NR70
PFUdA (2058-94-8)	mg/kg	<0.002	<0.002	<0.002		NR70
PFDoA (307-55-1)	mg/kg	<0.002	<0.002	<0.002		NR70
PFTrDA (72629-94-8)	mg/kg	<0.002	<0.002	<0.002		NR70
PFTeDA (376-06-7)	mg/kg	<0.002	<0.002	<0.002		NR70
PFHxDA (67905-19-5)	mg/kg	<0.002	<0.002	<0.002		NR70
PFODA (16517-11-6)	mg/kg	<0.005	<0.005	<0.005		NR70
FOUEA (70887-84-2)	mg/kg	<0.001	<0.001	<0.001		NR70
PFBS (375-73-5)	mg/kg	<0.001	<0.001	<0.001		NR70
PFPeS (2706-91-4)	mg/kg	<0.001	<0.001	<0.001		NR70
PFHxS (355-46-4)	mg/kg	0.0019	<0.001	<0.001		NR70
PFHpS (375-92-8)	mg/kg	<0.001	<0.001	<0.001		NR70
PFOS (1763-23-1)	mg/kg	0.015	<0.002	0.0060		NR70
PFNS (68259-12-1)	mg/kg	<0.001	<0.001	<0.001		NR70
PFDS (335-77-3)	mg/kg	<0.001	<0.001	<0.001		NR70
PFOSA (754-91-6)	mg/kg	<0.001	<0.001	<0.001		NR70
N-MeFOSA (31506-32-8)	mg/kg	<0.002	<0.002	<0.002		NR70
N-EtFOSA (4151-50-2)	mg/kg	<0.002	<0.002	<0.002		NR70
N-MeFOSAA (2355-31-9)	mg/kg	<0.002	<0.002	<0.002		NR70
N-EtFOSAA(2991-50-6)	mg/kg	<0.002	<0.002	<0.002		NR70
N-MeFOSE (24448-09-7)	mg/kg	<0.005	<0.005	<0.005		NR70
N-EtFOSE (1691-99-2)	mg/kg	<0.005	<0.005	<0.005		NR70

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Lab Reg No.		N21/020200	N21/020201	N21/020206		
Date Sampled		16-AUG-2021	18-AUG-2021	18-AUG-2021		
	Units					Method
PFAS (per-and poly-fluoroalkyl substances)						
4:2 FTS (757124-72-4)	mg/kg	<0.001	<0.001	<0.001		NR70
6:2 FTS (27619-97-2)	mg/kg	<0.001	<0.001	<0.001		NR70
8:2 FTS (39108-34-4)	mg/kg	<0.001	<0.001	<0.001		NR70
10:2 FTS (120226-60-0)	mg/kg	<0.002	<0.002	<0.002		NR70
8:2 diPAP (678-41-1)	mg/kg	<0.002	<0.002	<0.002		NR70
PFBA (Surrogate Recovery)	%	112	126	108		NR70
PFPeA (Surrogate Recovery)	%	119	96	93		NR70
PFHxA (Surrogate Recovery)	%	112	105	93		NR70
PFHpA (Surrogate Recovery)	%	117	100	104		NR70
PFOA (Surrogate Recovery)	%	124	113	110		NR70
PFNA (Surrogate Recovery)	%	100	121	100		NR70
PFDA (Surrogate Recovery)	%	115	120	95		NR70
PFUdA (Surrogate Recovery)	%	103	112	108		NR70
PFDoA (Surrogate Recovery)	%	115	118	108		NR70
PFTeDA (Surrogate Recovery)	%	119	123	115		NR70
PFHxDA (Surrogate Recovery)	%	117	104	108		NR70
FOUEA (Surrogate Recovery)	%	63	53	46		NR70
PFBS (Surrogate Recovery)	%	117	95	102		NR70
PFHxS (Surrogate Recovery)	%	127	101	106		NR70
PFOS (Surrogate Recovery)	%	118	109	128		NR70
PFOSA (Surrogate Recovery)	%	104	117	103		NR70
N-MeFOSA (Surrogate Recovery)	%	100	89	99		NR70
N-EtFOSA (Surrogate Recovery)	%	103	113	116		NR70
N-MeFOSAA (Surrogate Recovery)	%	97	105	92		NR70
N-EtFOSAA (Surrogate Recovery)	%	97	94	82		NR70
N-MeFOSE (Surrogate Recovery)	%	104	114	103		NR70
N-EtFOSE (Surrogate Recovery)	%	92	111	105		NR70
4:2 FTS (Surrogate Recovery)	%	84	60	63		NR70
6:2 FTS (Surrogate Recovery)	%	88	90	82		NR70
8:2 FTS (Surrogate Recovery)	%	75	74	74		NR70
8:2 diPAP (Surrogate Recovery)	%	233	117	104		NR70
Dates						
Date extracted		2-SEP-2021	2-SEP-2021	2-SEP-2021		
Date analysed		2-SEP-2021	2-SEP-2021	2-SEP-2021		

N21/020200
to
N21/020206

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

Selected PFAS surrogate recoveries are biased due to matrix effects.
High PFAS surrogate recoveries accepted - results corrected for recovery.
Surrogate recoveries low for selected analytes - PFAS LORs not raised since S/N > 10.

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Lab Reg No.		N21/020200	N21/020201	N21/020206		
Date Sampled		16-AUG-2021	18-AUG-2021	18-AUG-2021		
	Units					Method
Trace Elements						
Total Solids	%	63.3	77.7	95.3		NT2_49
Dates						
Date extracted		31-AUG-2021	31-AUG-2021	31-AUG-2021		
Date analysed		1-SEP-2021	1-SEP-2021	1-SEP-2021		

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All results are expressed on a dry weight basis.

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Client : AECOM AUSTRALIA PTY LTD <div style="background-color: black; width: 150px; height: 40px; margin: 5px 0;"></div> Attention : Project Name : QLD_0229_PFASOMP_20 Your Client Services Manager :	Job No. : AECO06/210830 Quote No. : QT-02018 Order No. : 60612487_3_1 Date Received : 30-AUG-2021 Sampled By : CLIENT Phone :
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Lab Reg No.	Sample Ref	Sample Description
N21/020199	0229_QC200_210816	WATER 16/08/21 13:08
N21/020202	0229_QC203_210818	WATER 18/08/21 10:00
N21/020203	0229_QC204_210818	WATER 18/08/21 10:09
N21/020204	0229_QC205_210818	WATER 18/08/21 11:56

Lab Reg No.	Date Sampled	Units	N21/020199	N21/020202	N21/020203	N21/020204	Method
			16-AUG-2021	18-AUG-2021	18-AUG-2021	18-AUG-2021	
PFAS (per-and poly-fluoroalkyl substances)							
PFBA (375-22-4)	ug/L		0.070	<0.05	0.10	0.72	NR70
PFPeA (2706-90-3)	ug/L		0.056	<0.02	0.097	1.4	NR70
PFHxA (307-24-4)	ug/L		0.30	<0.01	0.56	8.5	NR70
PFHpA (375-85-9)	ug/L		0.029	<0.01	0.069	0.82	NR70
PFOA (335-67-1)	ug/L		0.063	<0.01	0.11	1.2	NR70
PFNA (375-95-1)	ug/L		<0.01	<0.01	<0.01	0.12	NR70
PFDA (335-76-2)	ug/L		<0.01	<0.01	<0.01	<0.01	NR70
PFUdA (2058-94-8)	ug/L		<0.01	<0.01	<0.01	0.015	NR70
PFDaA (307-55-1)	ug/L		<0.01	<0.01	<0.01	<0.01	NR70
PFTrDA (72629-94-8)	ug/L		<0.02	<0.02	<0.02	<0.02	NR70
PFTeDA (376-06-7)	ug/L		<0.02	<0.02	<0.02	<0.02	NR70
PFHxDA (67905-19-5)	ug/L		<0.02	<0.02	<0.02	<0.02	NR70
PFODA (16517-11-6)	ug/L		<0.05	<0.05	<0.05	<0.05	NR70
FOUEA (70887-84-2)	ug/L		<0.01	<0.01	<0.01	<0.01	NR70
PFDS (335-77-3)	ug/L		<0.01	<0.01	<0.01	<0.01	NR70
PFPeS (2706-91-4)	ug/L		0.11	<0.01	0.27	3.4	NR70
PFHxS (355-46-4)	ug/L		0.82	<0.01	1.8	30	NR70
PFHpS (375-92-8)	ug/L		0.042	<0.01	0.097	0.84	NR70
PFOS (1763-23-1)	ug/L		1.3	<0.02	3.1	21	NR70
PFNS (68259-12-1)	ug/L		<0.01	<0.01	<0.01	0.010	NR70
PFBS (375-73-5)	ug/L		0.15	<0.01	0.31	3.4	NR70
PFOSA (754-91-6)	ug/L		<0.01	<0.01	<0.01	<0.01	NR70
N-MeFOSA (31506-32-8)	ug/L		<0.02	<0.02	<0.02	<0.02	NR70
N-EtFOSA (4151-50-2)	ug/L		<0.02	<0.02	<0.02	<0.02	NR70
N-MeFOSAA (2355-31-9)	ug/L		<0.01	<0.01	<0.01	<0.01	NR70
N-EtFOSAA(2991-50-6)	ug/L		<0.01	<0.01	<0.01	<0.01	NR70
N-MeFOSE (24448-09-7)	ug/L		<0.05	<0.05	<0.05	<0.05	NR70

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Lab Reg No.			N21/020199	N21/020202	N21/020203	N21/020204	
Date Sampled			16-AUG-2021	18-AUG-2021	18-AUG-2021	18-AUG-2021	
		Units					Method
PFAS (per-and poly-fluoroalkyl substances)							
N-EtFOSE (1691-99-2)	ug/L	<0.05	<0.05	<0.05	<0.05	<0.05	NR70
4:2 FTS (757124-72-4)	ug/L	<0.01	<0.01	<0.01	<0.01	<0.01	NR70
6:2 FTS (27619-97-2)	ug/L	<0.01	<0.01	<0.01	<0.01	0.20	NR70
8:2 FTS (39108-34-4)	ug/L	<0.01	<0.01	<0.01	<0.01	0.039	NR70
10:2 FTS (120226-60-0)	ug/L	<0.01	<0.01	<0.01	<0.01	<0.01	NR70
8:2 diPAP (678-41-1)	ug/L	<0.02	<0.02	<0.02	<0.02	<0.02	NR70
PFBA (Surrogate Recovery)	%	95	107	101	98		NR70
PFPeA (Surrogate Recovery)	%	83	95	96	109		NR70
PFHxA (Surrogate Recovery)	%	71	85	84	67		NR70
PFHpA (Surrogate Recovery)	%	96	103	91	99		NR70
PFOA (Surrogate Recovery)	%	110	110	109	116		NR70
PFNA (Surrogate Recovery)	%	72	96	81	76		NR70
PFDA (Surrogate Recovery)	%	81	88	91	104		NR70
PFUdA (Surrogate Recovery)	%	71	80	90	102		NR70
PFDoA (Surrogate Recovery)	%	52	69	82	104		NR70
PFTeDA (Surrogate Recovery)	%	55	79	89	102		NR70
PFHxDA (Surrogate Recovery)	%	88	97	103	141		NR70
FOUEA (Surrogate Recovery)	%	80	78	99	120		NR70
PFBS (Surrogate Recovery)	%	88	96	91	96		NR70
PFHxS (Surrogate Recovery)	%	88	100	75	55		NR70
PFOS (Surrogate Recovery)	%	90	104	116	108		NR70
PFOSA (Surrogate Recovery)	%	44	56	79	92		NR70
N-MeFOSA (Surrogate Recovery)	%	41	83	88	107		NR70
N-EtFOSA (Surrogate Recovery)	%	52	74	77	116		NR70
N-MeFOSAA (Surrogate Recovery)	%	42	59	80	94		NR70
N-EtFOSAA (Surrogate Recovery)	%	49	67	89	94		NR70
N-MeFOSE (Surrogate Recovery)	%	58	59	74	85		NR70
N-EtFOSE (Surrogate Recovery)	%	67	63	71	126		NR70
4:2 FTS (Surrogate Recovery)	%	70	91	45	49		NR70
6:2 FTS (Surrogate Recovery)	%	67	76	61	89		NR70
8:2 FTS (Surrogate Recovery)	%	54	58	60	107		NR70
8:2 diPAP (Surrogate Recovery)	%	76	102	92	128		NR70
Dates							
Date extracted		15-SEP-2021	15-SEP-2021	15-SEP-2021	15-SEP-2021		
Date analysed		15-SEP-2021	15-SEP-2021	15-SEP-2021	15-SEP-2021		

N21/020199
to
N21/020207

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

Selected PFAS surrogate recoveries are biased due to matrix effects.^δ
Surrogate recoveries low for selected analytes - PFAS LORs not raised since S/N > 10.



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16-SEP-2021

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Client : AECOM AUSTRALIA PTY LTD <div style="background-color: black; width: 150px; height: 20px; margin: 5px 0;"></div> Attention <div style="background-color: black; width: 100px; height: 15px; display: inline-block;"></div> Project Name : QLD_0229_PFASOMP 20 Your Client Services Manager <div style="background-color: black; width: 100px; height: 15px; display: inline-block;"></div>	Job No. : AECO06/210830 Quote No. : QT-02018 Order No. : 60612487_3_1 Date Received : 30-AUG-2021 Sampled By : CLIENT Phone <div style="background-color: black; width: 100px; height: 15px; display: inline-block;"></div>
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Lab Reg No.	Sample Ref	Sample Description
N21/020205	0229_QC206_210818	WATER 18/08/21 12:24
N21/020207	0229_QC208_210819	WATER 19/08/21 09:31

Lab Reg No.			N21/020205	N21/020207		
Date Sampled			18-AUG-2021	19-AUG-2021		
		Units				Method
PFAS (per-and poly-fluoroalkyl substances)						
PFBA (375-22-4)	ug/L	<0.05	0.13			NR70
PFPeA (2706-90-3)	ug/L	<0.02	0.17			NR70
PFHxA (307-24-4)	ug/L	0.061	0.90			NR70
PFHpA (375-85-9)	ug/L	<0.01	0.13			NR70
PFOA (335-67-1)	ug/L	0.016	0.18			NR70
PFNA (375-95-1)	ug/L	<0.01	<0.01			NR70
PFDA (335-76-2)	ug/L	<0.01	<0.01			NR70
PFUdA (2058-94-8)	ug/L	<0.01	<0.01			NR70
PFDoA (307-55-1)	ug/L	<0.01	<0.01			NR70
PFTrDA (72629-94-8)	ug/L	<0.02	<0.02			NR70
PFTeDA (376-06-7)	ug/L	<0.02	<0.02			NR70
PFHxDA (67905-19-5)	ug/L	<0.02	<0.02			NR70
PFODA (16517-11-6)	ug/L	<0.05	<0.05			NR70
FOUEA (70887-84-2)	ug/L	<0.01	<0.01			NR70
PFDS (335-77-3)	ug/L	<0.01	<0.01			NR70
PFPeS (2706-91-4)	ug/L	0.062	0.39			NR70
PFHxS (355-46-4)	ug/L	0.50	2.1			NR70
PFHpS (375-92-8)	ug/L	0.013	0.10			NR70
PFOS (1763-23-1)	ug/L	0.50	3.8			NR70
PFNS (68259-12-1)	ug/L	<0.01	<0.01			NR70
PFBS (375-73-5)	ug/L	0.19	0.47			NR70
PFOSA (754-91-6)	ug/L	<0.01	<0.01			NR70
N-MeFOSA (31506-32-8)	ug/L	<0.02	<0.02			NR70
N-EtFOSA (4151-50-2)	ug/L	<0.02	<0.02			NR70
N-MeFOSAA (2355-31-9)	ug/L	<0.01	<0.01			NR70
N-EtFOSAA(2991-50-6)	ug/L	<0.01	<0.01			NR70
N-MeFOSE (24448-09-7)	ug/L	<0.05	<0.05			NR70
N-EtFOSE (1691-99-2)	ug/L	<0.05	<0.05			NR70
4:2 FTS (757124-72-4)	ug/L	<0.01	<0.01			NR70

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Report No. RN1328463

Lab Reg No.			N21/020205	N21/020207		
Date Sampled			18-AUG-2021	19-AUG-2021		
		Units				Method
PFAS (per- and poly-fluoroalkyl substances)						
6:2 FTS (27619-97-2)	ug/L	<0.01	0.047			NR70
8:2 FTS (39108-34-4)	ug/L	<0.01	<0.01			NR70
10:2 FTS (120226-60-0)	ug/L	<0.01	<0.01			NR70
8:2 diPAP (678-41-1)	ug/L	<0.02	<0.02			NR70
PFBA (Surrogate Recovery)	%	109	96			NR70
PFPeA (Surrogate Recovery)	%	98	96			NR70
PFHxA (Surrogate Recovery)	%	79	75			NR70
PFHpA (Surrogate Recovery)	%	97	99			NR70
PFOA (Surrogate Recovery)	%	113	108			NR70
PFNA (Surrogate Recovery)	%	93	83			NR70
PFDA (Surrogate Recovery)	%	100	105			NR70
PFUdA (Surrogate Recovery)	%	89	98			NR70
PFDoA (Surrogate Recovery)	%	72	88			NR70
PFTeDA (Surrogate Recovery)	%	81	92			NR70
PFHxDA (Surrogate Recovery)	%	102	100			NR70
FOUEA (Surrogate Recovery)	%	92	95			NR70
PFBS (Surrogate Recovery)	%	96	84			NR70
PFHxS (Surrogate Recovery)	%	97	74			NR70
PFOS (Surrogate Recovery)	%	108	120			NR70
PFOSA (Surrogate Recovery)	%	56	81			NR70
N-MeFOSA (Surrogate Recovery)	%	53	67			NR70
N-EtFOSA (Surrogate Recovery)	%	54	70			NR70
N-MeFOSAA (Surrogate Recovery)	%	77	83			NR70
N-EtFOSAA (Surrogate Recovery)	%	72	90			NR70
N-MeFOSE (Surrogate Recovery)	%	61	83			NR70
N-EtFOSE (Surrogate Recovery)	%	60	94			NR70
4:2 FTS (Surrogate Recovery)	%	66	66			NR70
6:2 FTS (Surrogate Recovery)	%	73	70			NR70
8:2 FTS (Surrogate Recovery)	%	68	91			NR70
8:2 diPAP (Surrogate Recovery)	%	92	89			NR70
Dates						
Date extracted		15-SEP-2021	15-SEP-2021			
Date analysed		15-SEP-2021	15-SEP-2021			

Organics - NSW
Accreditation No. 198

16-SEP-2021

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National Measurement Institute

REPORT OF ANALYSIS

Page: 9 of 9
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ACCREDITED FOR
**TECHNICAL
COMPETENCE**

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Results relate only to the sample(s) as received and tested.

This Report supersedes reports: *RN1328446*

Measurement Uncertainty is available upon request.

Chemical Accreditation 198: 105 Delhi Road, North Ryde, NSW, 2113



Australian Government
National Measurement Institute

QUALITY ASSURANCE REPORT

Client: AECOM AUSTRALIA PTY LTD

NMI QA Report No: AECO06/210830

Sample Matrix: Liquid

Analyte	Method	LOR	Blank	Sample Duplicates			Recoveries	
				Sample	Duplicate	RPD	LCS	Matrix Spike
				ug/L	ug/L	%	%	%
		ug/L	ug/L	ug/L	ug/L	%	%	%
				N21/020207				
PFBA (375-22-4)	NR70	0.05	<0.05	0.13	0.13	0	113	NA
PFPeA (2706-90-3)	NR70	0.02	<0.02	0.17	0.17	0	103	NA
PFHxA (307-24-4)	NR70	0.01	<0.01	0.9	0.86	5.0	99	NA
PFHpA (375-85-9)	NR70	0.01	<0.01	0.13	0.13	0	98	NA
PFOA (335-67-1)	NR70	0.01	<0.01	0.18	0.18	0	95	NA
PFNA (375-95-1)	NR70	0.01	<0.01	<0.01	<0.01	-	104	NA
PFDA (335-76-2)	NR70	0.01	<0.01	<0.01	<0.01	-	101	NA
PFUdA (2058-94-8)	NR70	0.01	<0.01	<0.01	<0.01	-	96	NA
PFDoA (307-55-1)	NR70	0.01	<0.01	<0.01	<0.01	-	98	NA
PFTrDA (72629-94-8)	NR70	0.02	<0.02	<0.02	<0.02	-	100	NA
PFTeDA (376-06-7)	NR70	0.02	<0.02	<0.02	<0.02	-	113	NA
PFHxDA (67905-19-5)	NR70	0.02	<0.02	<0.02	<0.02	-	101	NA
PFOA (16517-11-6)	NR70	0.05	<0.05	<0.05	<0.05	-	94	NA
FOUEA (70887-84-2)	NR70	0.01	<0.01	<0.01	<0.01	-	102	NA
PFBS (375-73-5)	NR70	0.01	<0.01	0.47	0.44	7.0	105	NA
PFPeS (2706-91-4)	NR70	0.01	<0.01	0.39	0.37	5.0	100	NA
PFHxS (355-46-4)	NR70	0.01	<0.01	2.1	2.2	5.0	96	NA
PFHpS (375-92-8)	NR70	0.01	<0.01	0.1	0.099	1.0	103	NA
PFOS (1763-23-1)	NR70	0.02	<0.02	3.8	4.7	21	95	NA
PFNS (68259-12-1)	NR70	0.01	<0.01	<0.01	<0.01	-	91	NA
PFDS (335-77-3)	NR70	0.01	<0.01	<0.01	<0.01	-	95	NA
PFOA (754-91-6)	NR70	0.01	<0.01	<0.01	<0.01	-	102	NA
N-MeFOA (31506-32-8)	NR70	0.02	<0.02	<0.02	<0.02	-	114	NA
N-EtFOA (4151-50-2)	NR70	0.02	<0.02	<0.02	<0.02	-	115	NA
N-MeFOAA (2355-31-9)	NR70	0.01	<0.01	<0.01	<0.01	-	101	NA
N-EtFOAA (2991-50-6)	NR70	0.01	<0.01	<0.01	<0.01	-	113	NA
N-MeFOSE (24448-09-7)	NR70	0.05	<0.05	<0.05	<0.05	-	98	NA
N-EtFOSE (1691-99-2)	NR70	0.05	<0.05	<0.05	<0.05	-	85	NA
4:2 FTS (757124-72-4)	NR70	0.01	<0.01	<0.01	<0.01	-	125	NA
6:2 FTS (27619-97-2)	NR70	0.01	<0.01	0.047	0.04	16	107	NA
8:2 FTS (39108-34-4)	NR70	0.01	<0.01	<0.01	0.011	-	105	NA
10:2 FTS (120226-60-0)	NR70	0.01	<0.01	<0.01	<0.01	-	75	NA
8:2 diPAP (678-41-1)	NR70	0.02	<0.02	<0.02	<0.02	-	98	NA

Results expressed in percentage (%) or ug/L wherever appropriate.

Acceptable Spike recovery is 50-150%.

Maximum acceptable RPDs on spikes and duplicates is 40%.

'NA' = Not Applicable.

RPD= Relative Percentage Difference.

Signed:



Organics Manager, NMI-North Ryde
16/09/2021

Date:



Australian Government
National Measurement Institute

QUALITY ASSURANCE REPORT

Client: AECOM AUSTRALIA PTY LTD

NMI QA Report No: AECO06/210830

Sample Matrix: Solid

Analyte	Method	LOR	Blank	Sample Duplicates			Recoveries	
		mg/kg	mg/kg	Sample mg/kg	Duplicate mg/kg	RPD %	LCS %	Matrix Spike %
PFBA (375-22-4)	NR70	0.002	<0.002	NA	NA	NA	128	NA
PFPeA (2706-90-3)	NR70	0.002	<0.002	NA	NA	NA	107	NA
PFHxA (307-24-4)	NR70	0.001	<0.001	NA	NA	NA	104	NA
PFHpA (375-85-9)	NR70	0.001	<0.001	NA	NA	NA	104	NA
PFOA (335-67-1)	NR70	0.001	<0.001	NA	NA	NA	108	NA
PFNA (375-95-1)	NR70	0.001	<0.001	NA	NA	NA	102	NA
PFDA (335-76-2)	NR70	0.001	<0.001	NA	NA	NA	118	NA
PFUdA (2058-94-8)	NR70	0.002	<0.002	NA	NA	NA	106	NA
PFDoA (307-55-1)	NR70	0.002	<0.002	NA	NA	NA	119	NA
PFTrDA (72629-94-8)	NR70	0.002	<0.002	NA	NA	NA	150	NA
PFTeDA (376-06-7)	NR70	0.002	<0.002	NA	NA	NA	99	NA
PFHxDA (67905-19-5)	NR70	0.002	<0.002	NA	NA	NA	112	NA
PFODA (16517-11-6)	NR70	0.005	<0.005	NA	NA	NA	111	NA
FOUEA (70887-84-2)	NR70	0.001	<0.001	NA	NA	NA	114	NA
PFBS (375-73-5)	NR70	0.001	<0.001	NA	NA	NA	105	NA
PFPeS (2706-91-4)	NR70	0.001	<0.001	NA	NA	NA	106	NA
PFHxS (355-46-4)	NR70	0.001	<0.001	NA	NA	NA	108	NA
PFHpS (375-92-8)	NR70	0.001	<0.001	NA	NA	NA	104	NA
PFOS (1763-23-1)	NR70	0.002	<0.002	NA	NA	NA	126	NA
PFNS (68259-12-1)	NR70	0.001	<0.001	NA	NA	NA	110	NA
PFDS (335-77-3)	NR70	0.001	<0.001	NA	NA	NA	108	NA
PFOSA (754-91-6)	NR70	0.001	<0.001	NA	NA	NA	96	NA
N-MeFOSA (31506-32-8)	NR70	0.002	<0.002	NA	NA	NA	103	NA
N-EtFOSA (4151-50-2)	NR70	0.002	<0.002	NA	NA	NA	104	NA
N-MeFOSAA (2355-31-9)	NR70	0.002	<0.002	NA	NA	NA	82	NA
N-EtFOSAA(2991-50-6)	NR70	0.002	<0.002	NA	NA	NA	102	NA
N-MeFOSE (24448-09-7)	NR70	0.005	<0.005	NA	NA	NA	140	NA
N-EtFOSE (1691-99-2)	NR70	0.005	<0.005	NA	NA	NA	80	NA
4:2 FTS (757124-72-4)	NR70	0.001	<0.001	NA	NA	NA	120	NA
6:2 FTS (27619-97-2)	NR70	0.001	<0.001	NA	NA	NA	115	NA
8:2 FTS (39108-34-4)	NR70	0.001	<0.001	NA	NA	NA	125	NA
10:2 FTS (120226-60-0)	NR70	0.002	<0.002	NA	NA	NA	118	NA
8:2 diPAP (678-41-1)	NR70	0.002	<0.002	NA	NA	NA	102	NA

Results expressed in percentage (%) or mg/kg wherever appropriate.

Acceptable Spike recovery is 50-150%.

Maximum acceptable RPDs on spikes and duplicates is 40%.

'NA' = Not Applicable.

RPD= Relative Percentage Difference.

Signed:

Organics Manager, NMI-North Ryde
3/09/2021

Date:



Australian Government
Department of Industry,
Innovation and Science

National Measurement Institute

SAMPLE RECEIPT NOTIFICATION

CUSTOMER DETAILS

Attention: [REDACTED]
Customer: AECOM AUSTRALIA PTY LTD
Address: LEVEL 8
FORTITUDE VALLEY QLD 4006
Email: [REDACTED]
Telephone:
Fax:

LABORATORY DETAILS

Lab: National Measurement Institute
Contact: [REDACTED]
Address: 105 Delhi Road, North Ryde, NSW
NSW 2113
Email: [REDACTED]
Telephone: [REDACTED]
Fax:

SAMPLE DETAILS

NMI Job Name: AECO06/210830
Total No. of Samples: 9

LRNs	Estimated Report Date	Customer Sample ID	Lab Sample Description
N21/020199	16-SEP-2021	0229_QC200_210816	WATER 16/08/21 13:08

105 Delhi Road, North Ryde, NSW 2113 Tel: +61 2 9449 0111 www.measurement.gov.au

N a t i o n a l M e a s u r e m e n t I n s t i t u t e

N21/020200	16-SEP-2021	0229_QC201_210816	SOIL 16/08/21 13:06
N21/020201	16-SEP-2021	0229_QC202_210818	SOIL 18/08/21 10:00
N21/020202	16-SEP-2021	0229_QC203_210818	WATER 18/08/21 10:00
N21/020203	16-SEP-2021	0229_QC204_210818	WATER 18/08/21 10:09
N21/020204	16-SEP-2021	0229_QC205_210818	WATER 18/08/21 11:56
N21/020205	16-SEP-2021	0229_QC206_210818	WATER 18/08/21 12:24
N21/020206	16-SEP-2021	0229_QC207_210818	SOIL 18/08/21 14:47
N21/020207	16-SEP-2021	0229_QC208_210819	WATER 19/08/21 09:31

SAMPLE RECEIVED CONDITION

Date samples received: 30-AUG-2021

Sample received in good order: Yes

NMI Quotation no. provided:

Client purchase order number: 60612487_3_1

Temperature of samples: Chilled

Comments: ALL OK

Mode of Delivery: Courier

Additional Terms and Conditions

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

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

The lodgement of an order or receipt of samples for NMI services referenced in this Sample Receipt Notification constitutes an acceptance of the current version of NMI Terms and Conditions or other applicable Terms referenced in the NMI Quotation.

NMI Terms and Conditions are available on the web at

<https://www.industry.gov.au/client-services/testing-and-analysis-services/chemical-and-biological-analysis-services-terms-and-conditions>

Wet Season Sampling Factual Report, February to April 2022

PFAS OMP - Lavarack Barracks Townsville

13-Sep-2022

PFAS Ongoing Monitoring Program - Lavarack Barracks Townsville

Doc No. 60612487_RP66_20220913_2

Wet Season Sampling Factual Report, February to April 2022

PFAS OMP - Lavarack Barracks Townsville

Client: Department of Defence

ABN: 68 706 814 312

Prepared by

AECOM Australia Pty Ltd

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13-Sep-2022

Job No.: 60612487

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

Quality Information

Document Wet Season Sampling Factual Report, February to April 2022

Ref 60612487

Date 13-Sep-2022

Prepared by [REDACTED]

Reviewed by [REDACTED]

Revision History

Rev	Revision Date	Details	Authorised	
			Name/Position	Signature
0	01-Jun-2022	Draft for Review	[REDACTED]	
1	01-Sep-2022	Draft for Review	[REDACTED]	
2	13-Sep-2022	Final for issue	[REDACTED]	[REDACTED]

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Abbreviations

Term	Description
AECOM	AECOM Australia Pty Ltd
AFFF	Aqueous film forming foam
ALS	Australian Laboratory Services
ANZG	Australian and New Zealand Guidelines for Fresh and Marine Water Quality (2018)
ASC NEPM	National Environment Protection (Assessment of Site Contamination) Measure, as amended (2013)
DCMM	Defence Contamination Management Manual
Defence	Department of Defence
DO	Dissolved oxygen
EC	Electrical conductivity
HEPA	Heads of Environmental Protection Agencies
LOR	Limit of reporting
NEMP	National Environmental Management Plan
NHMRC	National Health and Medical Research Council
NMI	National Measurement Institute
NSW	New South Wales
OMP	Ongoing Monitoring Plan
ORP	Oxidation-reduction potential
PFAS	Per- and poly-fluoroalkyl substances
PFHxS	Perfluorohexane sulfonic acid
PFOA	Perfluorooctanoic acid
PFOS	Perfluorooctane sulfonate
PMAP	PFAS Management Area Plan
QA/QC	Quality Assurance/Quality Control
QLD	Queensland
SAQP	Sampling Analysis Quality Plan
SD	Sediment
SW	Surface Water

Unit	Definition	Unit	Definition
°C	Degrees Celsius	mg	Milligrams
L	Litre	mm	Millimetre
µS	Microsiemens	cm	Centimetre
kg	Kilogram	mV	Millivolts
m	Metre	µg	Micrograms

1.0 Introduction

1.1 General

AECOM Australia Pty Ltd (AECOM) was engaged by the Department of Defence (Defence) to implement the per- and poly-fluoroalkyl substances (PFAS) Ongoing Monitoring Plan (OMP) outlined in the PFAS Management Area Plan (PMAP) (Department of Defence, 2020) at Lavarack Barracks Townsville (the 'Base') located in the North Queensland Region. The location of the Base and the PFAS Source Areas are shown in **Figure 1** in **Appendix A**, PFAS Source Areas are identified and defined in the PMAP (Department of Defence, 2020). The OMP (Department of Defence, 2020) for Lavarack Barracks includes biannual groundwater, surface water, and sediment sampling events in October 2020, March/April 2021, August 2021, February to April 2022, August 2022 and February/March 2023.

These sampling events include:

- Groundwater sampling of 31 on-Base wells at Lavarack Barracks and nine off-Base wells in the suburbs of Annandale, Idalia and Wulguru.
- Sediment sampling at 18 on-Base locations at Lavarack Barracks and 13 off-Base locations in the Ross River and waterways in Annandale and Idalia with co-located surface water sampling when water is present.

A sampling and analysis quality plan (SAQP Rev 5, AECOM, 2022) was prepared to provide details of the sampling event.

This sampling event factual report has been prepared to report the results of the 2022 Wet Season Sampling Event, which was completed over three months - February, March and April 2022. This report specifically highlights first-time detections and/or new exceedances of human health or ecological guideline values.

This report has been prepared in accordance with the *PFAS OMP Factual Report Guidance*, v0.2, May 2021 (Department of Defence, 2021).

1.2 Objectives

The objective of the OMP is to "*set out a program of ongoing sampling to assess changes in the nature and extent of PFAS concentration within the environment, where Defence's historical use of legacy [Aqueous Film Forming Foam] AFFF has led to an identified potential risk to a receptor, or potential future risk to a receptor*" (Department of Defence, 2020).

The objectives of the SAQP (AECOM, 2022) are to:

- Implement the OMP prepared as part of the PMAP (Department of Defence, 2020); and
- Collect data that will enable Defence to maintain an up to date understanding of the distribution, concentration and transport of PFAS at the Base.

The data will assist in the timely identification of risks and inform Defence's approach to the management of PFAS to protect human health and the environment, including updates and revisions to the PMAP.

The objective of this phase of works is to implement the 2022 wet season sampling event scope of works in accordance with the SAQP (AECOM, 2022).

2.0 Scope of Work

The sampling event at the Base was completed in general accordance with the SAQP (AECOM, 2022). In summary, the scope of works for this sampling event included:

- Review of the SAQP prior to the monitoring event to ensure compliance with relevant Australia guidance.
- *February 2022* – Collection of groundwater samples at three wells (MW117D, MW118 and MW119) located in construction areas. Due to the construction work, these wells were sampled two weeks early to ensure groundwater samples were collected from these wells. Deviations from the SAQP are discussed in **Section 3.7**.
- *March 2022* - Collection of sediment and co-located surface water samples (where water was present) at 31 locations including 18 on-Base and 13 off-Base locations (refer to **Figure 2** and **3, Appendix A**). Collection of groundwater samples at 36 locations. One monitoring well, MW117S, was not sampled as it has been destroyed during construction works, refer to **Section 3.7**.
- *April 2022* - Collection of three sediment and eight co-located surface water samples (where water was present) at on-Base locations (refer to **Figure 2** and **3, Appendix A**). Due to anomalous PFAS detections in the groundwater sample from MW217, a replicate groundwater sample was collected, refer to **Section 3.7**.
- Collection of groundwater gauging data and water quality parameter data for surface water and groundwater sample locations (where water was present).
- Analysis of all samples for the PFAS suite (28 analytes) at the standard limit of reporting (LOR).
- Collection of field duplicate and triplicate samples at a rate of 1 in 10 primary samples, one rinsate sample per fieldwork day, and one trip blank per batch analysed for PFAS suite (28 analytes).
- Data management of all OMP field and laboratory data in the Defence ESdat database.
- Preparation of this Sampling Event Factual Report.

Table 1 Groundwater Sampling Locations

Source Area	Monitoring Well ID
Eastern PFAS Contamination Area	MW018, MW114, MW115, MW116, MW139
Former B Squadron	MW135
Former Fire Station	MW105, MW128
Former Fire Training Area	MW131
Former Helicopter Squadron	MW102
Lavarack Golf Course and Sporting Fields	MW065, MW120, MW121, MW122, MW123I, MW123S
Monocell	MW072, MW074, MW106
Stockpile Designated Area 2	MW141
Suspected Aqueous Film Forming Foam (AFFF) Disposal Area	MW101
Top, Middle and Lower Dams	MW138
Base Boundary – On-Base	MW002, MW003, MW117D ¹ , MW117S ¹ , MW118 ¹ , MW119 ¹ , MW124, MW125I, MW125S
Off-Base	MW205S, MW212, MW217 ² , MW220S, MW226, MW232, MW233, MW235S, MW236S

¹ Monitoring wells are currently in a construction area and were accessed for sample collection two weeks before the main sampling event. Samples were collected from MW117D, MW118 and MW119 only. Monitoring wells MW117S and MW117D were damaged or destroyed by construction works however a sample was able to be recovered from MW117D prior to destruction. As the sample was collected after the well had been damaged, and the sample was not collected in accordance with the SAQP requirements, MW117D results should be assessed with caution. No sample was able to be recovered from MW117S

² Supplementary sample collected in April 2022 to confirm results.

Table 2 Surface Water Sampling Locations

Source Area	Surface Water Location ID
Eastern PFAS Contamination Area	SW119, SW121
Former Fire Station	SW109, SW110 ²
Lavarack Golf Course and Sporting Fields	SW129 ¹ , SW130 ¹
Top Middle and Lower Dams ¹	SW139, SW140, SW144
Remaining on-Base	SW113, SW120 ²
Base Boundary	SW126 ¹ , SW128 ¹ , SW132, SW133 ¹ , SW134 ¹ , SW135, SW136
Off-Base	SW203, SW205, SW211, SW212, SW217, SW220, SW227, SW232, SW233, SW242, SW243, SW244, SW245

¹ Locations were dry in March 2022, sample was collected in April 2022.

² Sample was collected in March 2022 and confirmed in April 2022 with supplementary sampling.

Table 3 Sediment Sampling Locations

Source Area	Sediment Location ID
Eastern PFAS Contamination Area	SD119, SD121 ¹
Former Fire Station	SD109, SD110
Lavarack Golf Course and Sporting Fields	SD129, SD130
Top Middle and Lower Dams ¹	SD139, SD140, SD144
Remaining on-Base	SD113, SD120
Base Boundary	SD126, SD128, SD132 ¹ , SD133, SD134, SD135, SD136
Off-Base	SD203, SD205, SD211, SD212, SD217, SD220, SD227, SD232, SD233, SD242 ¹ , SD243, SD244, SD245

¹ Sediment was not present in March 2022, sample was collected in April 2022.

3.0 Methodology

The methodology used for 2022 wet season sampling event was in general accordance with the SAQP (AECOM, 2022) and is summarised in **Sections 3.1-3.3**.

3.1 Groundwater Sampling Methodology

The groundwater sampling methodology is outlined in **Table 4** below.

Table 4 Groundwater Sampling Methodology

Item	Details
Groundwater Gauging	<p>Depth to groundwater was measured at the beginning of the sampling round to facilitate gauging all wells within the shallow aquifer on the same day.</p> <p>The depth to groundwater was also measured in each monitoring well immediately prior to the collection of groundwater samples.</p>
Water Quality Parameters	<p>Temperature, electrical conductivity (EC), dissolved oxygen (DO), oxidation reduction potential (ORP), pH and observations of water quality were recorded using a calibrated water quality meter (results detailed in Table T1). Equipment calibration certificates for the water quality meter are provided in Appendix F.</p>
Sampling Methodology	<p>Groundwater samples were collected from all monitoring wells using no-purge methodology HydraSleeves™, which were installed within the screened interval of each well (based on a review of the well construction log) for a minimum of 24 hours prior to the sampling round (as detailed in Table T1, Appendix B).</p> <p>For wells without available construction details, HydraSleeves™ were installed at the bottom of the well, consistent with the screened interval for wells installed in the same aquifer. Once sampling was completed, new HydraSleeves™ were deployed in preparation for the next sampling round, with the exception of those wells noted in Table T1, Appendix B.</p>

3.2 Surface Water Sampling Methodology

The surface water sampling methodology is outlined in **Table 5** below.

Table 5 Surface Water Sampling Methodology

Item	Details
Water Quality Parameters	Temperature, electrical conductivity (EC), dissolved oxygen (DO), oxidation reduction potential (ORP), pH and observations of water quality were recorded using a calibrated water quality meter. Equipment calibration certificates for the water quality meter are provided in Appendix F .
Sampling Methodology	Samples were collected from immediately below the water surface, with either a sampling pole or directly into laboratory supplied sample containers, to minimise collection of sediment or floating materials in the samples. At each location, a new, laboratory-supplied container was lowered into the water with the cap immediately applied once the container was full. Where the waterway could not be accessed from the bank a telescopic sampler with a decontaminated stainless-steel scoop was used to collect the sample. The sample was immediately transferred into the new laboratory supplied container.

3.3 Sediment Sampling Methodology

The sediment sampling methodology is outlined in **Table 6** below.

Table 6 Sediment Sampling Methodology

Item	Details
Sampling Methodology	Samples representative of potentially deposited sediments were collected from within the water body (if possible) using a piston sediment sampler or with a trowel from the base of drains (where possible). Samples were collected from the surface of the sediment up to a depth of 0.1 m, where this depth was achievable. At each location, a new laboratory supplied container was used for each sample.
Logging	Sediment characteristics were recorded for each sample and are summarised in Table T5, Appendix B .

3.4 Quality Assurance/Quality Control and Analysis

The Quality Assurance/Quality Control (QA/QC) requirements and analysis completed for the OMP sampling event are summarised in **Table 7**, below.

Table 7 QAQC and Analysis for OMP

Item	Details
QA/QC Samples	Field QA/QC samples collected included intra-laboratory duplicate and inter-laboratory duplicate samples (i.e. splits), trip blank samples and rinsate samples. Intra- and inter-laboratory samples were collected at a rate of one per ten primary samples. Trip blanks were prepared in the laboratory by filling sampling containers with laboratory supplied PFAS-free deionised water and were included at a rate of one per batch of samples (excluding private property sampling). Rinsate samples were collected at a rate of one per day of sampling when non-dedicated equipment was used by pouring laboratory supplied PFAS-free deionised water over the decontaminated sampling equipment. Refer to Appendix C for assessment of QA/QC sample data.

Item	Details
Sample Analysis	<p>All primary samples were submitted for PFAS suite analysis using the standard levels of detection.</p> <p>Australian Laboratory Services (ALS) Environmental Pty Ltd Brisbane, Queensland was used as the primary laboratory. The National Measurement Institute (NMI) of Sydney, NSW was used as the secondary laboratory. ALS and NMI methods for analyses of PFAS in are certified by the National Association of Testing Authorities (NATA).</p> <p>Chain of Custody Forms are presented in Appendix D. Laboratory certificates are presented in Appendix E.</p>

3.5 Adopted Screening Criteria

Adopted screening criteria references national guidance in the form of the PFAS National Environmental Management Plan (NEMP), Defence estate and environmental strategies, and Defence PFAS-specific strategies and guidance. Guidance documents used to assess the dataset include the following:

- PFAS NEMP, (HEPA 2020).
- Department of Health, 2019. *Health Based Guidance Values for PFAS for use in site investigations in Australia*. April 2017 [updated September 2019].
- National Health and Medical Research Council (NHMRC), 2019. *Guidance on PFAS in Recreational Water*. August 2019 (NHMRC 2019).
- *National Environment Protection (Assessment of Site Contamination) Measure 1999, Schedule B1, as amended in 2013* (ASC NEPM, 2013).

In accordance with the OMP (Defence, 2020) and SAQP (AECOM, 2022), the adopted PFAS screening criteria to assess the data generated as part of the OMP are presented in **Table 8** below.

Table 8 Summary of Adopted Screening Criteria

Pathway	Compound	Criteria	Comment / Reference
Human Health Receptors			
Drinking Water	PFOS + PFHxS	0.07 µg/L	The values are from the PFAS NEMP (HEPA, 2020). Where the guideline value refers to the sum of PFOS + PFHxS, this includes PFOS only, PFHxS only and the sum of the two (HEPA, 2020). <i>All off base groundwater results will be compared to these criteria. as well as one surface water location (SW245) which is within Townsville's emergency drinking water supply.</i>
	PFOA	0.56 µg/L	
Recreational use – surface water	PFOS + PFHxS	2 µg/L	The values are from the PFAS NEMP (HEPA, 2020). <i>All surface water results will be compared to these criteria.</i>
	PFOA	10 µg/L	
Ecological Receptors			
Freshwater and marine water (95% species protection values)	PFOS	0.13 µg/L	The values are from the PFAS NEMP (HEPA, 2020). <i>All surface water and groundwater results will be compared to these criteria.</i>
	PFOA	220 µg/L	

3.6 Data Quality Objectives and Data Validation

The data quality objectives (DQO) and data quality indicators (DQI) adopted for these works are presented in the SAQP (AECOM, 2022).

In accordance with Step 5 of the DQO process (AECOM, 2022), resampling of a groundwater location (MW217) outside of the main sampling event was completed to verify an anomalous detection of PFAS. This is further discussed in **Table 9, Section 3.7**.

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

Data validation procedures employed in the assessment of the field and laboratory QA/QC data indicated that the reported analytical results are representative of the sample locations and that the overall quality of the analytical data produced is acceptably reliable for the purpose of this report.

All data collected during this event have been reviewed and uploaded to the Defence ESdat database in accordance with Defence Contamination Management Manual (DCMM) (Defence, 2018 as amended 2021) Annex L requirements.

3.7 Deviations from the SAQP

Table 9 lists the deviations from the SAQP (AECOM, 2022) during this sampling round.

Table 9 Deviations from the SAQP during 2022 Wet Season Sampling Event

SAQP	2022 Wet Season Sampling Event	Impact of Deviation
Collection of surface water at SW120, SW126, SW128, SW129, SW130, SW133, SW134	No surface water present at time of initial sampling round in March 2022 at SW120, SW126, SW128, SW129, SW130, SW133, SW134. Sampling completed in April 2022, following rainfall when surface water was present.	Minor – data set is considered representative of broader Base conditions.
Collection of sediment at SD121, SD132, SD242	No sediment was present in the March 2022 sampling event and was therefore collected following rainfall in April 2022.	Nil – data set is considered representative of broader Base conditions.
Collection of groundwater samples from MW117S, MW117D, MW118 and MW119 as part of 2022 wet season.	Monitoring wells were accessed for sampling two weeks before the main sampling event as the wells are located in a construction zone, some of which were set to be destroyed during the construction works. MW117S was not sampled as it had already been destroyed. The HydraSleeve™ at MW117D was removed by construction workers prior to destruction and was observed to have a high sediment load.	No data were available from MW117S as the well was destroyed. Interpret results from MW117D with caution as sample collection was not completed in accordance with the SAQP. Assess the state of the two remaining wells upon completion of construction works and determine if MW118 and MW119 are still serviceable and suitable for OMP sampling.
Collection of groundwater sample from MW217.	Laboratory analytical results for the sample collected at MW217 on 3 March 2022 indicated anomalous PFAS detections (including 0.06 µg/L 6:2 FTS, 0.02 µg/L PFHxS and 0.08 µg/L PFOS). Due to the anomaly, the well was resampled in April 2022 to verify the detections. Resampling confirmed that only PFHxS was present at detectable concentrations (0.01 µg/L).	Resampling of the well indicated PFOS concentrations were below the limit reporting and consistent with historical results, therefore results for MW217 collected on 3 March 2022 were not verified, not considered representative of PFAS concentrations and discarded.

4.0 Well Network Maintenance

Maintenance on wells within the Lavarack Barracks PFAS OMP network was completed by AECOM between 4 September 2021 and 1 March 2022. This work involved maintenance of three existing monitoring wells. Refer to **Appendix G** for survey data for MW003.

Table 10 below provides a summary of the work completed.

Table 10 Summary of maintenance works completed by AECOM on the well network.

Well ID	Description of Work
MW003	Cut off well at bend below ground level and install replacement monument. Resurvey well.
MW121	Repaired concrete plinth to stabilise well.
MW226	Replaced well cap.
MW232	Replaced rusted bolts.
MW233	Ground reinstated to stabilise well.

Prior to the works at MW003 a service locator was engaged to ensure avoidance of services for safety and property protection purposes during digging around the headworks of the well.

5.0 Field Observations and Results

The 2022 wet season sampling event was completed between 28 February and 4 March 2022 with supplementary sampling completed between 22 and 26 April 2022. Groundwater gauging and deployment of HydraSleeves™ was conducted at the beginning of the sampling round.

The results are summarised in the following sections.

Details on weather conditions and estate management works or training activities during the sampling event are recorded in **Table 11**.

Table 11 Weather Conditions and Estate Activities at Time of Sampling

Item	Observations
Weather Conditions	<p>The Bureau of Meteorology (BOM) (BOM, 2022) reported the following monthly rainfall data leading up to and during the 2022 wet season sampling event:</p> <ul style="list-style-type: none"> January 2022: 338.2 mm February 2022: 120.2 mm March 2022: 39.6 mm April 2022: 293.4 mm <p>Weather was warm and sunny during the sampling program in February and March 2022. Light rain was experienced during the sampling program in April 2022.</p>
Estate Management Works or Training Activities	<p>Construction associated with the Land 400 project was underway during the sampling event, on the corner of Lachlan Wilson Drive and Gallipoli Drive. This did not impact access to sample locations, however, earthworks in this area have the potential to impact PFAS concentrations in surface water and sediment samples down gradient of the project, near the Base boundary.</p> <p>Monitoring wells MW117S, MW117D, MW118 and MW119 are currently in a construction area and were sampled two weeks before the main sampling event. These monitoring locations have since been recorded as destroyed.</p> <p>No other estate management works, or training exercises impacted access to sample groundwater, surface water and sediment locations.</p>

The results of the sampling event are summarised in **Sections 5.1-5.3**.

5.1 Groundwater

5.1.1 Observations and Field Measurements

Table 12 Groundwater Observations and Field Measurements

Item	Observations
Access	<p>All monitoring wells were accessible, with the exception of monitoring well MW117S, which was destroyed during construction works. Monitoring wells MW117D, MW118 and MW119 were also within a construction compound and were sampled two weeks prior to the main wet season sampling event based on availability of access to these areas.</p>
Monitoring Well Network	<p>The headworks at the following monitoring wells were noted to be damaged during the 2022 Wet Season Sampling Event:</p> <ul style="list-style-type: none"> Monitoring wells MW117S and MW117D have been destroyed by construction works. MW117D was able to be sampled however due to disturbance of the well, the results are potentially not representative of actual conditions and should be viewed with caution. Concrete around the monument of MW125S was cracked. Well casing was unaffected, and the well was able to be sampled in this sampling event.

Item	Observations
	<ul style="list-style-type: none"> Data loggers were present in MW205S, MW232 and MW236S. <ul style="list-style-type: none"> Data loggers were removed to deploy HydraSleeves™ and replaced in the well immediately, on top of the HydraSleeve™. The data loggers were removed a second time during retrieval of the HydraSleeves™ and immediately replaced.
Field Observations	<p>Groundwater from five monitoring well locations (MW101, MW121, MW128, MW212 and MW235S) had a sulphurous odour. A slight organic odour was recorded during the sampling of monitoring well MW124.</p> <p>Groundwater colour was typically recorded as turbid brown/grey, to clear or low turbidity.</p> <p>No visible or olfactory indications of contamination were observed during the sampling of the other monitoring wells.</p> <p>Field observations are presented Table T1 in Appendix B.</p>
Depth to Groundwater	<p>Depth to groundwater ranged between 0.561 (MW232) and 5.373 (MW205S) metres below top of casing (mBTOC). It is noted that multiple groundwater systems are present across the Management Area. Groundwater elevations within the shallow (alluvial) aquifer were between 1.027 (MW205S) and 13.70 metres Australian Height Datum (mAHD). Groundwater elevations within the deeper (rock) aquifer were between 18.848 (MW128) and 25.705 (MW141) mAHD.</p> <p>Groundwater gauging data are presented in Table T1 in Appendix B.</p>
Groundwater Flow Direction	<p>Groundwater contours and inferred groundwater flow directions in April 2022 are shown on Figure 4 in Appendix A. The inferred local groundwater flow direction is to the north across the western portion of the Site and north east in the eastern portion of the Site, consistent with previous monitoring rounds. Monitoring wells which are tidally influenced have been removed from the contours as have wells MW105 and MW128 which were identified to have incorrect survey data.</p>
Water Quality Parameters	<p>Groundwater quality parameters were measured at the time of sampling. The readings are presented in Table T1 in Appendix B and are summarised below, covering all sampling completed:</p> <ul style="list-style-type: none"> DO results ranged between 0.25 mg/L (MW139) to 6.94 mg/L (MW018) indicating poorly to well oxygenated conditions. EC ranged from 79.3 µS/cm (MW018) to 51,132 µS/cm (MW232) indicating fresh to saline conditions. pH ranged from 5.72 (MW217) to 7.6 (MW065). pH results generally indicated slightly acidic to slightly alkaline conditions. ORP ranged from -194.2 mV (MW115) to 222.6 mV (MW236S) indicating moderately to strongly reducing conditions. Temperature ranged from 26.3°C (MW217) to 37.0°C (MW117D). <p>These results are generally consistent with the groundwater quality parameters from the previous three monitoring rounds since dry season 2020.</p>

5.1.2 Groundwater Analytical Results

Of the 38 groundwater wells sampled during this event, 34 samples reported concentrations of PFAS compounds above the laboratory LOR. The PFAS groundwater analytical results from this sampling event are presented in **Table T2** in **Appendix B**. Four of the nine samples collected off-Base, exceeded the adopted drinking water guideline for PFOS+PFHxS.

One exceedance of the ecological guideline for PFOS was observed in off-Base well (MW236S). A total of 18 on-Base and boundary samples exceeded the ecological guideline (for PFOS). No on or off Base samples exceeded the PFOA ecological guideline.

Historical groundwater results are presented in **Table T7, Appendix B**. There were no first-time detections of PFOS, PFOA or PFHxS in any samples during this sampling event, with the exception of PFOS in the March 2022 sample collected from MW217 (0.08 µg/L). Supplementary sampling at MW217 did not confirm the detection of PFOS (<0.001 µg/L), with replicate results consistent with the historical range of concentrations. The supplementary sampling results have therefore been adopted as representative of PFOS concentrations at MW217 and no first-time detections of PFOS have been recorded for Wet Season 2022.

There were no new exceedances of the human health or ecological guidelines during the sampling. Groundwater sampling results were generally within the same order of magnitude as historically reported concentrations.

It is noted that concentrations of PFOS, PFHxS, 6:2 FtS and PFHxA at MW117D were higher than historically reported; historically the Sum of PFAS concentrations were not reported greater than 0.1 µg/L, however during the 2022 wet season sampling event the Sum of PFAS was reported as 0.38 µg/L. MW117D was disturbed prior to sampling due to construction activities that led to the destruction of the monitoring well, the sample was recorded as turbid with a grey / brown colour which may suggest that soil from construction activities entered the HydraSleeve™ prior to sample collection. As the construction activities may have impacted sample integrity at MW117D, reported results are not considered to be representative of the groundwater conditions at this location.

5.2 Surface Water

5.2.1 Observations and Field Measurements

Table 13 Surface Water Observations and Field Measurements

Item	Observations
Access	All surface water locations were accessible during the sampling event. SW120, SW126, SW128, SW129, SW130, SW133 and SW134 were dry in March 2022 and following rainfall, they were sampled in April 2022 during a supplementary sampling round.
Field Observations	Surface water at SW139 had a slight organic odour. Surface water at two locations (SW121 and SW205) had a slight biological sheen on the surface. High algal load was noted in surface water at SW135. Surface water at sample location SW211 was observed to be slowly flowing. All other surface water sample locations were visually observed to be not flowing. No other visible or olfactory indications of contamination were observed during the sampling of the surface water locations. Field observations are presented Table T3 in Appendix B .
Water Quality Parameters	Surface water quality parameters were measured at the time of sampling. Readings are presented in Table T3 in Appendix B and are summarised below: <ul style="list-style-type: none"> • DO results ranged between 0.92 mg/L (SW211) and 11.71 mg/L (SW232) indicating moderately to well oxygenated conditions. • EC ranged from 39.1 µS/cm (SW110) to 49,925 µS/cm (SW243) fresh to saline conditions. • pH ranged from 6.67 (SW212) to 8.91 (SW227). pH results generally indicated near neutral to alkaline conditions. • ORP ranged from -12.9 mV (SW109) to 192 mV (SW205) indicating moderately to strongly reducing conditions. • Temperature ranged from 25°C (SW119) to 37.3°C (SW232).

5.2.2 PFAS Surface Water Analytical Results

Samples collected from 25 locations reported concentrations of PFAS compounds above the laboratory LOR. The PFAS surface water analytical results from this sampling event are presented in **Table T4** in **Appendix B**. PFOS concentrations in 13 samples exceeded the adopted ecological guidelines for PFOS. No samples exceeded the ecological guideline for PFOA. Sum of PFOS+PFHxS concentrations in two on-Base samples (SW109 and SW110) exceeded the adopted recreational use guidelines (**Table T4, Appendix B**).

New historical maximum concentrations were initially identified in the March 2022 sampling round however supplementary sampling at SW109 and SW120 did not confirm new historical maximums, with replicate results consistent with the historical range of concentrations.

Historical surface water results are presented in **Table T8, Appendix B** and were all reported within the historical range of concentrations. There were no confirmed first-time detections of PFOS, PFOA or sum of PFOS+PFHxS and no new exceedances of the human health or ecological guidelines during the sampling event.

5.3 Sediment

5.3.1 Observations and Field Measurements

Table 14 Sediment Observations

Item	Observations
Access	All sediment sampling locations were accessible. During the March 2022 sampling event, locations SD121, SD132 and SD242 consisted of large cobbles and no sediment was present. The sediment sample at these locations was collected in April 2022 following rainfall.
Field Observations	No visible or olfactory indications of contamination were observed during the sampling of sediment locations. Organic odours were detected at sample locations SD139 and SD205. Sediment logging and observation data are presented in Table T5, Appendix B .

5.3.2 PFAS Sediment Analytical Results

Of the 31 sediment samples collected, 22 samples reported concentrations of PFAS compounds above the laboratory LOR. The PFAS sediment analytical results from this sampling event are presented in **Table T6** in **Appendix B**.

Historical sediment results presented in **Table T9, Appendix B**. There were no first-time detections of PFOA or PFOS+PFHxS in sediment. Sediment sampling results were generally within the historical range of concentrations.

There are no endorsed human health or ecological guideline values available for sediment.

6.0 Summary and Next Sampling Event

6.1 Summary of Sampling Event

The routine OMP Wet Season Sampling Event was undertaken at the Base between 28 February and 4 March 2022. Some sampling was completed on 18 February 2022, prior to the main sampling event due to access restrictions at selected locations. Supplementary sampling to confirm first-time detections and new exceedances and to collect the remaining samples was completed between 22 and 26 April 2022. This wet season sampling event included sampling from 38 groundwater monitoring locations, 25 surface water monitoring locations and 31 sediment monitoring locations.

Table 15 summarises the findings of both the March 2022 and April 2022 sampling events and the recommended actions.

Table 15 Summary of Sampling Event

Item	Comment	Recommended Actions
Groundwater: Access to sampling locations	Access constraints necessitated that four monitoring locations, MW117S, MW117D, MW118 and MW119, were accessed for sampling two weeks early. MW117S and MW117D were not accessible as they have been destroyed. MW117S was unable to be sampled and the Hydrasleeve™ from MW117D was collected by the construction contractor and provided to AECOM for analysis, however these results are not considered to be representative of groundwater conditions and should be reviewed with caution.	Ongoing monitoring in accordance with the OMP. Review locations in light of ongoing construction activities and replace wells if and where required.
Surface Water/ Sediment: Insufficient or absent media to sample	During the March 2022 sampling event, five surface water monitoring locations, SW120, SW128, SW129, SW130 and SW134, did not contain surface water at the time of sample collection. Three sediment monitoring locations, SD121, SD132 and SD242, also had insufficient sediment present to enable sampling. Supplementary sampling in April 2022 has addressed this data gap.	Ongoing monitoring in accordance with the OMP. Review locations in light of sample suitability if long term matrix availability becomes a constraint.
Analytical Results	PFAS compounds were detected above laboratory LOR in 34 of the 38 groundwater samples, 27 of the 33 surface water samples and 22 of the 31 sediment samples analysed.	Ongoing monitoring in accordance with the OMP.
First-time detections and new exceedances.	There were no first-time detections of Sum of PFOS+PFHxS or PFOA or new exceedances of the NHMRC (2019) recreational use guidelines, drinking water guidelines (off-site samples only) or the 95% species protection ecological guidelines (HEPA, 2020).	Ongoing monitoring in accordance with the OMP.

6.2 Upcoming Sampling Events

The next biannual sampling event is scheduled for August 2022.

6.3 Upcoming Annual Interpretive Report

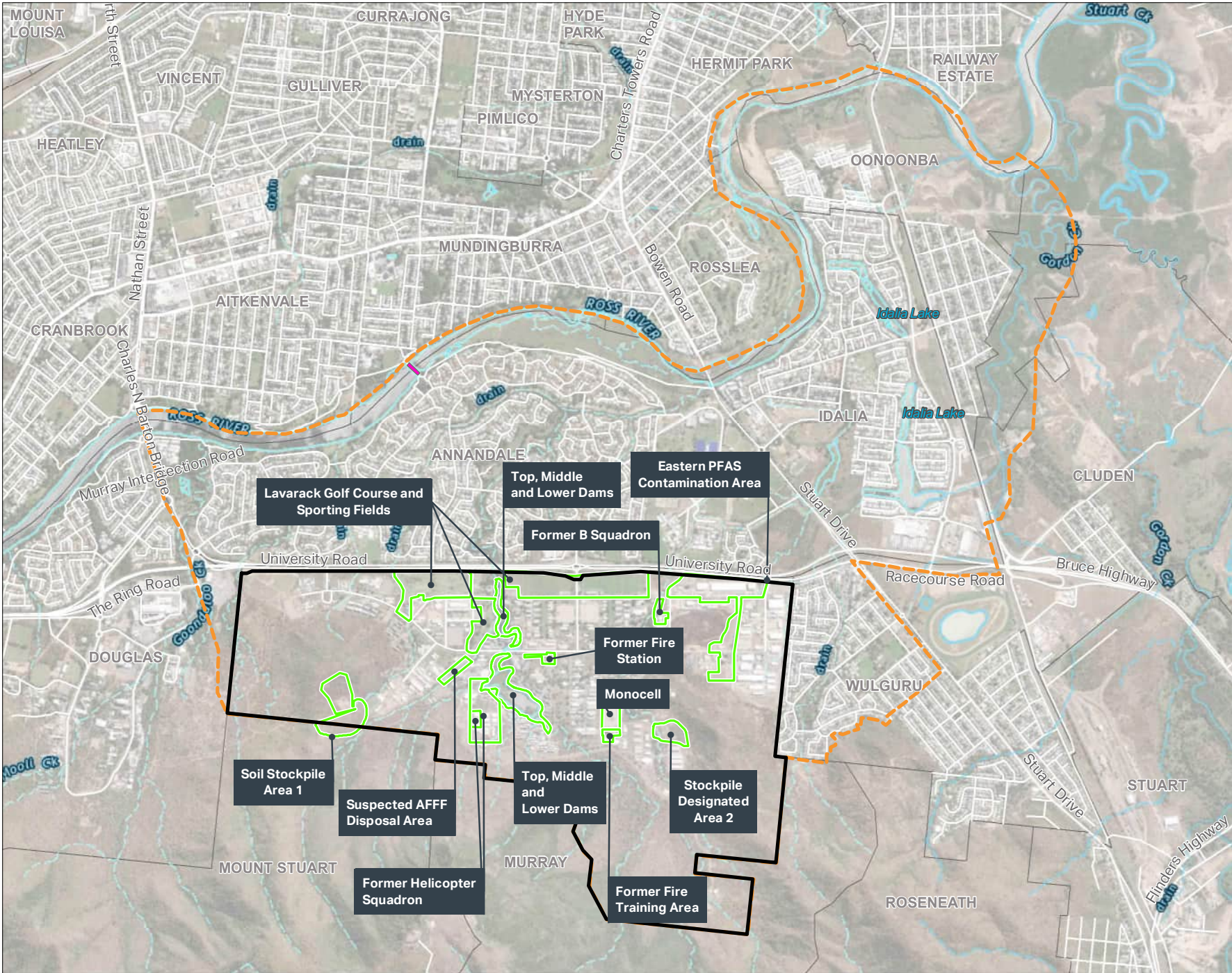
The next annual interpretive report is scheduled for December 2022.

7.0 References

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Appendix A

Figures



- Legend
- Base boundary
 - Management Area
 - Aplin's Weir
 - Source Areas
 - Watercourses

FIGURE 1:
LAVARACK BARRACKS
LOCATION AND
SOURCE AREAS

PROJECT NAME:
PFAS OMP
REPORT NAME:
PFAS OMP – Lavarack Barracks
(0229) Townsville,
Sample Event Factual Report
August 2021
CLIENT NAME:
Department of Defence
PROJECT NUMBER:
60612487

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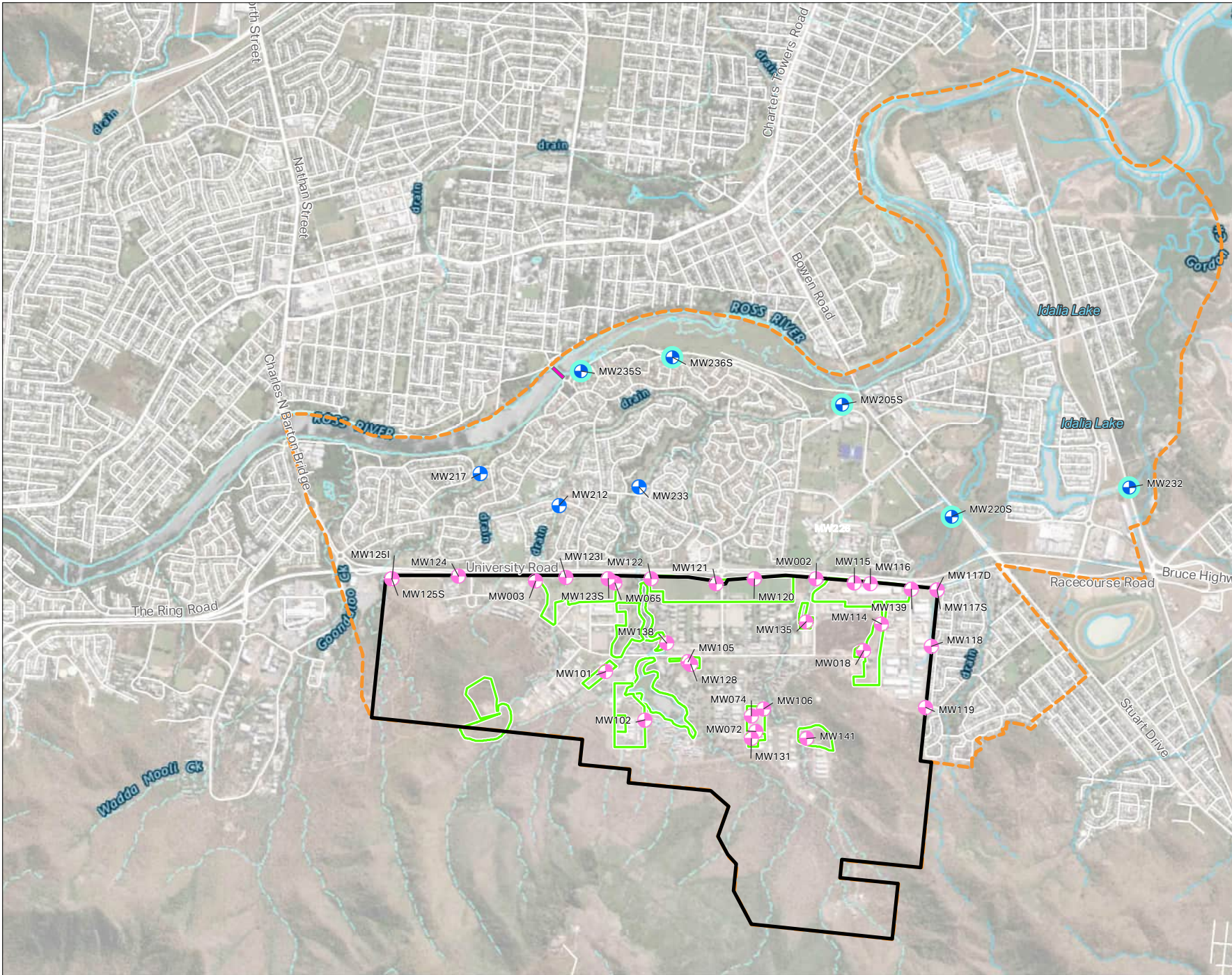
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Sources:
Base Data: (c) 2020 (ESRI, Digital Globe, GeoEye, Earthstar Geographics, CNES/Airbus DS,
USDA, USGS, AeroGRID, IGN and the GIS User

Legend

- Base boundary
- Management Area
- Aplin's Weir
- Source
- Watercourses
- On-Base Monitoring Well
- Off-Base Monitoring Well
- Tidally Influenced Groundwater Sample Location



**FIGURE 2:
GROUNDWATER
MONITORING LOCATIONS**

PROJECT NAME:
PFAS OMP
REPORT NAME:
PFAS OMP – Lavarack Barracks
(0229) Townsville,
Sample Event Factual Report
Aug 2021
CLIENT NAME:
Department of Defence
PROJECT NUMBER:
60612487

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Sources:
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USDA, USGS, AeroGRID, IGN and the GIS User



Legend

- Base boundary
- Management Area
- Aplin's Weir
- Source Areas
- Watercourses
- On-Base Co-located Surface Water and Sediment Sample Location
- Off-Base Co-located Surface Water and Sediment Sample Location

**FIGURE 3:
SURFACE WATER AND
SEDIMENT MONITORING
LOCATIONS**

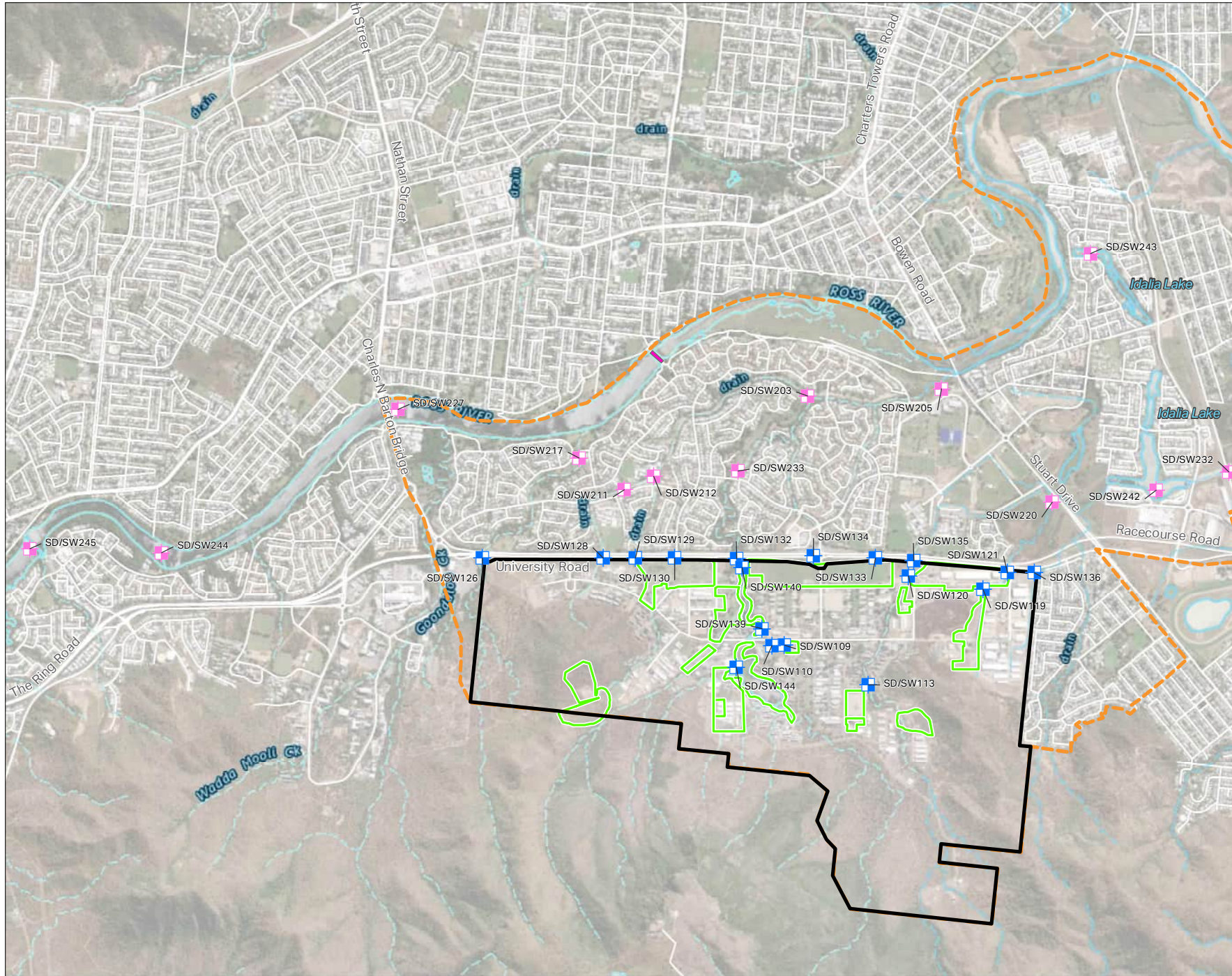
PROJECT NAME:
PFAS OMP
REPORT NAME:
PFAS OMP – Lavarack Barracks
(0229) Townsville,
Sample Event Factural Report
August 2021
CLIENT NAME:
Department of Defence
PROJECT NUMBER:
60612487

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Legend

- Base boundary
- Management Area
- Aplin's Weir
- Source Areas
- Watercourses
- Groundwater Contour
- Inferred Groundwater Flow Direction
- Groundwater Monitoring Well

Note: All elevations are in m AHD. Some elevations were unable to be plotted due to a data error

**FIGURE 4:
INFERRED
GROUNDWATER
CONTOURS- SHALLOW
AQUIFER (ALLUVIUM)
WET SEASON**

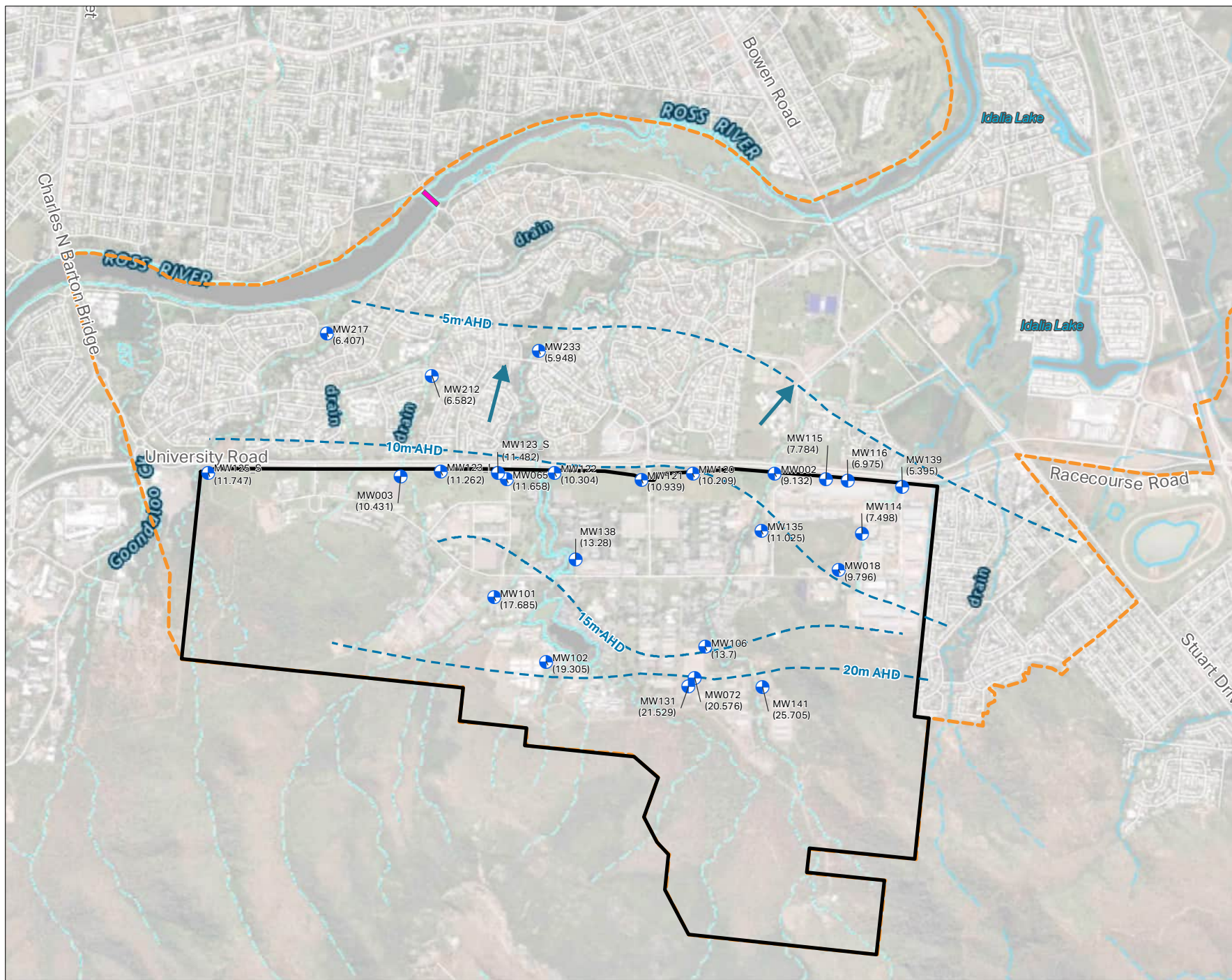
PROJECT NAME:
PFAS OMP
REPORT NAME:
PFAS OMP – Lavarack Barracks
(0229) Townsville,
Sample Event Factual Report
March and April 2022
CLIENT NAME:
Department of Defence
PROJECT NUMBER:

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Appendix B

Analytical Tables

Table T1: Groundwater Gauging and Water Quality Parameters

Location Code	HydraSleeve Installation Date	Gauging Date and Time	Sample Date	Well Screen Depths (mbtoc)	Well Depth (mbtoc)	Depth to Water (mbtoc)	HydraSleeve Installation Depth (mbTOC)*	TOC Elevation (mAHD)	Groundwater Elevation (mAHD)	Condition of Well	DO (mg/L)	EC (µS/cm)	pH	Eh/Redox (mV)	Temp (°C)	Turbidity	Water Colour	Odour	Sheen	Sample Method/Comments
Eastern PFAS Contamination Area																				
MW018	18/08/2021	2/03/2022	3/03/2022	Not available in ESdat	9.05	2.634	7.75	12.43	9.796	Good	6.94	79.3	7.37	16.2	33.9	Low	Light Yellow	No odour	No sheen	HydraSleeve
MW114	18/08/2021	2/03/2022	3/03/2022	Not available in ESdat	6.68	1.402	5.38	8.9	7.498	Good	2.44	20360	7.41	24.4	32.7		Yellow	No odour	No sheen	HydraSleeve
MW115	18/08/2021	2/03/2022	3/03/2022	12.7 - 15.7	15.62	1.976	14.32	9.76	7.784	Damaged	1.59	953	7.24	-194.2	32.7	Low	Clear	No odour	No sheen	HydraSleeve without collar. Casing bent approximately 0.75 mbTOC.
MW116	18/08/2021	2/03/2022	3/03/2022	5 - 8	7.88	1.635	6.58	8.61	6.975	Good	3.28	15493	7.25	132.6	31.4	Low	Light Yellow	No odour	No sheen	HydraSleeve
MW139	18/08/2021	2/03/2022	3/03/2022	2.8 - 5.8	5.76	1.135	4.46	6.53	5.395	Good	0.25	10854	6.43	150.7	30.1	Low	Yellow / Brown	No odour	No sheen	HydraSleeve
Former B Squadron																				
MW135	18/08/2021	2/03/2022	3/03/2022	3 - 6	6.365	3.935	5.065	14.96	11.025	Good	2.71	2642	6.57	86.5	32.2	Low	Light Yellow	No odour	No sheen	HydraSleeve.
Former Fire Station																				
MW105	18/08/2021	3/03/2022	3/03/2022	3 - 6	6.29	2.09	4.99	21.2	19.11	Good	3.02	3985	7.11	92.8	30.6	Clear	Clear	No odour	No sheen	HydraSleeve.
MW128	18/08/2021	3/03/2022	3/03/2022	2.6 - 5.6	5.47	2.432	4.17	21.28	18.848	Good	2.32	267.8	7.53	-153.2	30.9	Low	Light Yellow	Rotten egg smell (sulfurous)	No sheen	HydraSleeve.
Former Fire Training Area																				
MW131	19/08/2021	3/03/2022	3/03/2022	5.4 - 8.4	8.7	3.711	7.4	25.24	21.529	Good	1.79	1380	6.6	-18.3	31.2	Low	Clear	Not available in ESdat	No sheen	HydraSleeve. HydraSleeve not redeployed due to tree roots.
Former Helicopter Squadron																				
MW102	18/08/2021	3/03/2022	3/03/2022	8.5 - 14.5	9.81	3.565	8.51	22.87	19.305	Good	2.25	13977	6.85	75.4	30.8	Medium	Light Brown	No odour	No sheen	HydraSleeve.
Lavarack Golf Course & Sporting Field																				
MW065	18/08/2021	3/03/2022	3/03/2022	1.5 - 6	6.5	1.762	5.2	13.42	11.658	Good	1.02	2772	7.6	119.1	30.8	Clear	Clear	No odour	No sheen	HydraSleeve. Small amount of sediment in the bottom of the HydraSleeve.
MW120	18/08/2021	2/03/2022	3/03/2022	4 - 7	7.58	3.111	6.28	13.32	10.209	Good	0.87	6754	7.38	130.9	29.2	Low	Yellow / Brown	No odour	No sheen	HydraSleeve.
MW121	18/08/2021	3/03/2022	3/03/2022	2.5 - 5.8	6.39	2.731	5.09	13.67	10.939	Concrete plinth repaired 1/3/22	0.46	8500	7.23	134.7	27.8	Low	Dark Grey	Rotten egg smell (sulfurous)	No sheen	HydraSleeve. Casing and monument in good condition, ground washed away under concrete plinth, well wobbles.
MW122	18/08/2021	3/03/2022	3/03/2022	9.3 - 16.3	16.9	4.136	15.6	14.44	10.304	Good	0.45	2258	6.99	144.2	28.2	Low	Light Yellow / Brown	No odour	No sheen	HydraSleeve. Sediment in bottom third of HydraSleeve.
MW123I	18/08/2021	3/03/2022	3/03/2022	5.8 - 8.8	10.11	2.778	8.81	14.04	11.262	Good	0.5	28661	7.02	148.8	27.8	Low	Light Yellow	No odour	No sheen	HydraSleeve. Sediment in the bottom of the HydraSleeve.
MW123S	18/08/2021	3/03/2022	3/03/2022	1 - 5	5.6	1.998	4.3	13.48	11.482	Good	1.85	4695	7.26	120.8	29.4	Clear	Clear	No odour	No sheen	HydraSleeve. Black/grey sediment in bottom of HydraSleeve. Ants in well.

Table T1: Groundwater Gauging and Water Quality Parameters

Location Code	HydraSleeve Installation Date	Gauging Date and Time	Sample Date	Well Screen Depths (mbtoc)	Well Depth (mbtoc)	Depth to Water (mbtoc)	HydraSleeve Installation Depth (mbTOC)*	TOC Elevation (mAHD)	Groundwater Elevation (mAHD)	Condition of Well	DO (mg/L)	EC (µS/cm)	pH	Eh/Redox (mV)	Temp (°C)	Turbidity	Water Colour	Odour	Sheen	Sample Method/Comments
Monocell																				
MW072	20/08/2021	3/03/2022	3/03/2022	Not available in ESdat	7.928	4.854	6.628	25.43	20.576	Good	1.97	2005	6.71	64.9	32.3	Low	Clear	No odour	No sheen	HydraSleeve. HydraSleeve not redeployed due to conflict with other monitoring program.
MW074	19/08/2021	3/03/2022	3/03/2022	Not available in ESdat	7.13	3.742	5.83	Not available in ESdat	Not available in ESdat	Good	1.7	2143	-	110.1	34.1	Low	Clear	No odour		HydraSleeve. HydraSleeve not redeployed due to conflict with other monitoring program.
MW106	18/08/2021	3/03/2022	3/03/2022	2.5 - 8.5	10.14	4.685	8.84	23.84	13.7	Good	3.66	2916	6.61	202.3	36.5	Low	Clear	No odour	No sheen	HydraSleeve.
Stockpile Designated Area 2																				
MW141	17/08/2021	3/03/2022	3/03/2022	Not available in ESdat	8.815	2.485	7.515	28.19	25.705	Good	3.53	1500	6.72	117.9	30.6	Clear	Clear	No odour	No sheen	HydraSleeve.
Suspected AFFF Disposal Area																				
MW101	18/08/2021	3/03/2022	3/03/2022	5 - 9	6.87	3.545	5.57	21.23	17.685	Good	3.11	2585	6.54	-84.6	31	Turbid	Light Brown	Rotten egg smell (sulfurous)	No sheen	HydraSleeve. HydraSleeve not redeployed due to tree roots.
Top, Middle and Lower Dams																				
MW138	18/08/2021	3/03/2022	3/03/2022	6 - 9	9.07	3.21	7.77	16.49	13.28	Good	2.66	1708	6.82	-15.7	30.8	Low	Clear	No odour	No sheen	HydraSleeve.
Base Boundary																				
MW002	19/08/2021	2/03/2022	3/03/2022	Not available in ESdat	5.21	2.218	3.91	11.35	9.132	Good	0.7	1106	6.99	141.7	29.1	Low	Yellow / Brown	No odour	No sheen	HydraSleeve. HydraSleeve not redeployed due to conflict with other monitoring program.
MW003	18/08/2021	3/03/2022	3/03/2022	Not available in ESdat	30.83	3.519	29.53	13.95	10.431	Damaged	0.49	9119	7.26	127.8	29	Low	Light Yellow	No odour	No sheen	HydraSleeve without collar. Well casing bent at ground level. HydraSleeve not redeployed.
MW117D	17/08/2021	15/02/2022	14/02/2021	15 - 20	19.75	SWL not gauged due to construction	18.45	5.95	Not available in ESdat	Destroyed	3.37	10987	7.1	52.8	37	Turbid	Grey / Brown	No odour	No sheen	Sampled two weeks early by Contractor. Due to disturbance of the well and incorrect sampling technique by the contractor, sample results have not been included in the data set.
MW117S	17/08/2021	15/02/2022	3/03/2022	2.9 - 5.9	5.85	Not available in ESdat	4.55	5.96	Not available in ESdat	Not available in ESdat	Not sampled									Well not sampled. Has been destroyed by construction. Well and hydra sleeve were located buried in soil but could not be retrieved due to damage to the casing. No sample collected.
MW118	17/08/2021	15/02/2022	18/02/2022	3 - 6	6.02	1.927	4.72	10.54	Not available in ESdat	Good	2.64	5324	7.23	121.9	30.4	Clear	Light Yellow	No odour	No sheen	HydraSleeve. Sampled two weeks early due to construction.
MW119	17/08/2021	15/02/2022	18/02/2022	5.4 - 10.4	10.41	3.722	9.11	18.78	Not available in ESdat	Good	2.26	7090	6.75	202.8	29.3	Clear	Clear	No odour	No sheen	HydraSleeve. Sampled two weeks early due to construction.
MW124	17/08/2021	15/02/2022	2/03/2022	3 - 6	7.89	2.884	6.59	14.41	Not available in ESdat	Good	0.85	25624	6.48	144.5	29.4	Clear	Clear	Slight Organic Odour	Not available in ESdat	HydraSleeve.
MW125I	17/08/2021	Not available in ESdat	2/03/2022	5.8 - 8.8	21.92	5.22	20.62	16.67	Not available in ESdat	Good	-	3384	6.69	161.4	28.6	Clear	Clear	No odour	No sheen	HydraSleeve.
MW125S	17/08/2021	1/03/2022	2/03/2022	1 - 5	7.71	4.933	6.41	16.68	11.747	Damaged	2.48	4272	6.7	155.2	28.7	Clear	Clear	No odour	No sheen	HydraSleeve. Casing and monument in good condition, concrete plinth cracked at base.

Table T1: Groundwater Gauging and Water Quality Parameters

Location Code	HydraSleeve Installation Date	Gauging Date and Time	Sample Date	Well Screen Depths (mbtoc)	Well Depth (mbtoc)	Depth to Water (mbtoc)	HydraSleeve Installation Depth (mbTOC)*	TOC Elevation (mAHD)	Groundwater Elevation (mAHD)	Condition of Well	DO (mg/L)	EC (µS/cm)	pH	Eh/Redox (mV)	Temp (°C)	Turbidity	Water Colour	Odour	Sheen	Sample Method/Comments
Off-Base																				
MW205S	19/08/2021	2/03/2022	3/03/2022	8 - 11	8.8	5.373	7.5	6.4	1.027	Good	0.57	28337	6.31	130.3	28.7	Low	Light Yellow	No odour	No sheen	HydraSleeve. Data logger in well, HydraSleeve not redeployed.
MW212	18/08/2021	3/03/2022	3/03/2022	6 - 9	8.86	1.728	7.56	8.31	6.582	Good	0.26	9713	7.11	122.8	29	Medium	Light Brown	Rotten egg smell (sulfurous)	No sheen	HydraSleeve.
MW217	18/08/2021	3/03/2022	3/03/2022	3 - 6	5.45	0.943	4.15	7.35	6.407	Good	0.65	13166	6.3	124.8	28.3	Low	Black / Grey	No odour	No sheen	HydraSleeve. Sediment in bottom of HydraSleeve.
	3/03/2022	22/04/2022	22/04/2022	3 - 6	5.45	1.717	4.15	7.35	5.633	Good	1.49	11260	5.72	53.4	26.3	Low	Light Grey	No odour	No sheen	Resample of MW217
MW220S	18/08/2021	3/03/2022	3/03/2022	2 - 5	6.02	1.773	4.72	3.75	1.977	Good	0.56	45840	6.47	134.9	29.1	Low	Light Yellow	No odour	No sheen	HydraSleeve.
MW226	19/08/2021	28/02/2022	3/03/2022	Not available in ESdat	5.85	0.901	4.55	Not available in ESdat	Not available in ESdat	Good	-	15201	5.88	186.2	30	Clear	Clear	No odour	No sheen	HydraSleeve. HydraSleeve not redeployed on private property. End cap replaced. Well protected by plastic dog kennel and fence.
MW232	20/08/2021	2/03/2022	3/03/2022	1 - 4	3.03	0.561	1.73	2.31	1.749	Good	0.36	51132	6.39	149.2	30.8	Low	Light Yellow	No odour	No sheen	HydraSleeve.
MW233	18/08/2021	3/03/2022	3/03/2022	4.2 - 7.2	7.56	0.922	6.26	6.87	5.948	Monument wobbles, ground has washed away under concrete plinth.	0.42	6726	6.67	152.5	29	Low	Light Yellow / Brown	No odour	No sheen	HydraSleeve. Ants in well.
MW235S	18/08/2021	3/03/2022	3/03/2022	4.1 - 8.1	7.94	5.105	6.64	7.08	1.975	Good	0.31	2166	6.41	80.5	29.9	Low	Dark Grey	Rotten egg smell (sulfurous)	No sheen	HydraSleeve. Data logger in well. HydraSleeve was not redeployed.
MW236S	19/08/2021	3/03/2022	4/03/2022	4 - 7	6.92	4.62	5.62	6.53	1.91	Good	3.19	491.5	6.42	222.6	28.4	Turbid	Light Brown	No odour	No sheen	HydraSleeve.

mbtoc - metres below top of casing
 TOC - top of casing
 mAHD - metres above Australian Height Datum
 DO - Dissolved Oxygen
 EC - Electrical Conductivity
 Eh - Redox Oxidation Potential
 Temp - Temperature
 mg/L - milligrams per litre

µS/cm - microsiemens per centimetre
 °C - degrees Celcius
 "-" denotes no analysis recorded
 mV - millivolt
 # denotes disturbance to the well may have impacted sample integrity
 * Depth at which collar of the HydraSleeve was installed. Length of HydraSleeve = 1.3 m

Table T3: Surface Water Quality Parameter Results

Location Code	Sample Date	DO mg/L	EC µS/cm	pH	Redox (mV)	Temp (°C)	Turbidity	Water Colour	Odour	Sheen	Sample Location Morphology	Comments
Eastern PFAS Contamination Area												
SW119	22/04/2022	8.06	594	7.71	49.1	25	Low	Pale yellow	No odour	No sheen	Concrete drain. Not flowing.	Not enough water present for parameter readings on sample day, parameters collected during subsequent round.
SW121	1/03/2022	3.89	2609	7.26	-12.1	31.6	Low	Yellowish Red	No odour	Biosheen Appearance	Concrete drain. Water not flowing.	Sample taken downstream of culvert, upstream on Base had no water.
Former Fire Station												
SW109	1/03/2022	2.47	2618	7.27	-12.9	28.8	Medium	Dark Reddish Brown	No odour	No sheen	Open earthen drain, no flow.	
SW110	1/03/2022	2.85	4157	7.27	-10	30.7	Medium	Pale yellow	No odour	No sheen	Open earthen drain, no flow.	
	26/04/2022	7.28	39.1	6.83	179.8	23.4	Clear	Pale yellow	No odour	No sheen	Earthen drain with concrete culvert, not flowing.	Heavy rain previous night
Lavarack Golf Course & Sporting Field												
SW129	22/04/2022	9.65	235.9	8.51	75.5	25.7	Clear	Pale yellow	No odour	No sheen	Culvert, no flow.	No water (dry culvert) during initial round.
SW130	22/04/2022	9.34	620	7.35	100.8	25.8	Clear	Pale yellow	No odour	No sheen	Culvert, no flow.	No water (dry culvert) during initial round.
Top, Middle and Lower Dams												
SW139	1/03/2022	6.08	415.2	7.18	131	33.4	Low	Pale yellow	Slight Organic Odour	No sheen	Dam, no flow.	
SW140	1/03/2022	5.97	328.6	6.99	189.6	32.4	Low	Pale yellow	No odour	No sheen	Dam, no flow.	
SW144	1/03/2022	2.94	337.7	7.35	83.7	31.6	Low	Pale yellow	No odour	No sheen	Dam, no flow.	
Remaining On-Base												
SW113	1/03/2022	5.98	351	7.2	125.1	31.9	Low	Pale yellow	No odour	No sheen	Creek, no flow.	
SW120	22/04/2022	7.07	155.7	7.51	81	24.9	Low	Pale yellow	No odour	No sheen	Creek, no flow.	No water (dry creek bed) during initial round.
Base Boundary												
SW126	22/04/2022	5.26	114.7	7.14	116	26.4	Clear	Yellow	No odour	No sheen	Culvert, slow flow.	
SW128	22/04/2022	6.08	155.7	7.77	127.1	26	Low	Pale yellow	No odour	No sheen	Culvert, no flow.	No water (dry culvert) during initial round.
SW132	1/03/2022	5.74	458.9	7.53	98.1	34.8	Low	Pale yellow	No odour	No sheen	Rock drain, no flow.	
SW133	22/04/2022	7.16	130.7	7.38	103.3	24.8	Clear	Pale yellow	No odour	No sheen	Culvert, no flow.	No water (dry culvert) during initial round.
SW135	1/03/2022	6	559	7.22	156.4	33	Low	Pale yellow	No odour	No sheen	Concrete drain, no flow	Algae in sample.
Off-Base												
SW203	2/03/2022	3.83	14224	7.21	-2	32.4	Low	Pale yellow	No odour	No sheen	Creek, no flow.	
SW205	2/03/2022	5.38	41342	7.29	192	32.5	Low	-	No odour	Slight sheen	Ross River. Water not flowing.	
SW211	2/03/2022	0.92	13071	7.15	169.2	29.8	Low	Pale yellow	No odour	No sheen	Rock drain. Slowly flowing.	
SW212	2/03/2022	2.72	13609	6.67	181	28.7	Low	Pale yellow	No odour	No sheen	Concrete drain. Not flowing.	
SW217	2/03/2022	6.88	1099	7.64	97.6	32.1	Low	Pale yellow	No odour	No sheen	Creek, no flow.	
SW220	2/03/2022	7.18	2005	7.47	128.7	34.9	Medium	Pale yellow	No odour	No sheen	Earthen drain. Not flowing.	Water was present under the road culvert. This was sampled
SW227	1/03/2022	9.25	254.4	8.91	120.2	35.4	Clear	Dark Reddish Brown	No odour	No sheen	Ross River, immediately downstream of weir. Water not flowing.	
SW232	2/03/2022	11.71	29508	8.61	81.8	37.3	Medium	Pale yellow	No odour	No sheen	Creek, no flow.	
SW233	2/03/2022	3.6	1348	7.5	87.5	31.3	Low	Pale yellow	No odour	No sheen	Creek, no flow.	
SW242	2/03/2022	-	28552	8.49	91.08	35.4	Low	-	Other	No sheen	Lake. Water not flowing.	
SW243	2/03/2022	6.84	49925	7.86	96.2	34.6	Low	Light Olive Brown	No odour	No sheen	Lake. Water not flowing.	
SW244	28/02/2022	7.61	246.4	8.05	160.3	35.6	Clear	Reddish Yellow	No odour	No sheen	Ross River, downstream of Nathan St bridge. Water not flowing.	
SW245	27/02/2022	6.98	156.3	7.4	188.8	30.5	Clear	Dark Reddish Brown	No odour	No sheen	Ross River, immediately upstream of weir. Water not flowing	

- Not Recorded

Table T5: Sediment Observation Results

Location ID	Date	Sample Description	Odour	Comment
Eastern PFAS Contamination Area				
SD119	1/03/2022	Silty SAND, brown and black, fine grained, sub-angular, saturated, low organic content.	No odour	
SD121	22/04/2022	Clayey SAND, dark brown to dark grey, fine grained, loose, saturated with some organics (grass roots).	No odour	
Former Fire Station				
SD109	1/03/2022	Silty GRAVEL, cobbles to boulders present, grey and brown, saturated, very poorly graded, low organic content (leaves).	No odour	Low organic content (leaves). Very rocky/gravelly.
SD110	1/03/2022	CLAY and SILT, grey/brown, low plasticity, poorly graded, low organic content.	No odour	High organic content (reeds and leaves).
Lavarack Golf Course & Sporting Field				
SD129	2/03/2022	Gravelly SAND, brown/red, poorly graded, some fine cohesive particles, moist, some organics (grass).	No odour	High organic content (roots).
SD130	2/03/2022	Gravelly SAND, reddish/brown, poorly graded, moist, low organic content.	No odour	Low organic content. Moisture increasing with depth.
Top, Middle and Lower Dams				
SD139	1/03/2022	Sandy SILT, dark brown, low plasticity, well graded, saturated, high organic content.		
SD140	1/03/2022	SILT and SAND, high organic content, grey and dark grey, moderately graded, high organic content including roots.	Organic	High organic content (roots, leaves and decaying sticks). Low proportion of soil matrix.
SD144	1/03/2022	Silty SAND, dark brown, fine grained, high organic content.	No odour	High organic content (roots and leaves).
Remaining On-Base				
SD113	1/03/2022	SAND, loose, fine to medium grained, sub angular to rounded, well graded, dry, low organic content.	No odour	
SD120	1/03/2022	Gravelly SAND, poorly graded, moist, reddish brown, low organic content.	No odour	
Base Boundary				
SD126	2/03/2022	Gravelly SAND, brown/red, poorly graded, moist, low organic content.	No odour	
SD128	2/03/2022	Sandy GRAVEL, brown/grey, poorly graded, moderate organic content (roots).	No odour	
SD132	22/04/2022	Gravelly SAND, fine to coarse grain with fine to coarse gravels, some cobbles, loose, wet, dark brown, some organics (roots).	No odour	
SD133	1/03/2022	Silty SAND, soft, grey, fine, poorly graded, dry, organic material present.	No odour	
SD134	1/03/2022	Silty CLAY, dark brown, medium plasticity, moist, high organic content.	No odour	High organic content (roots and leaves).
SD135	1/03/2022	Gravelly SAND, soft, light brown and orange, sub angular to sub rounded coarse sand with fine to coarse gravels, saturated.	No odour	High organic content.
SD136	2/03/2022	Silty SAND, reddish/brown, poorly graded, saturated, high organic content.	No odour	High organic content (algal biofilm and leaves).
Off-Base				
SD203	2/03/2022	SAND, medium coarse, saturated, well graded, angular, low organic content.	No odour	
SD205	2/03/2022	Silty CLAY, dark brown, medium plasticity, moist, moderate organic content (roots).	Organic	Moderate organic content (roots and leaves).
SD211	3/03/2022	Sandy GRAVEL, dark grey, fine graded, moderate organic content (woody material)	No odour	
SD212	3/03/2022	SAND, reddish brown, coarse, poorly graded, with some medium gravel, saturated, moderate organic material.	No odour	
SD217	2/03/2022	CLAY, dark brown, medium plasticity, high organic content (biota, roots and leaves).	No odour	
SD220	2/03/2022	CLAY, dark brown/black, medium plasticity, moderate organic content.	No odour	
SD232	2/03/2022	SILT and CLAY, brown and black, medium plasticity, moderate organic content.	No odour	
SD233	2/03/2022	CLAY, dark brown, medium plasticity, wet, high organic content.	No odour	
SD242	22/04/2022	Sandy CLAY, soft, dark brown to dark grey, medium plasticity, saturated, some fine sands with trace organics (grass roots).	No odour	
SD243	2/03/2022	Silty CLAY, dark grey, black, medium plasticity, low organic content.	No odour	

Appendix C

Data Validation

DATA VALIDATION REPORT

Project No.:	60612487	Validation by:	██████████	Date:	12/05/2022
Client:	Department of Defence				
Site:	Lavarack Barracks Townsville (0229)				
Matrix type:	Groundwater, surface water, sediment	Data verified by:	██████████	Date:	12/05/2022
No. of primary samples:	39 groundwater, 24 surface water, 28 sediment (March 2022) 1 groundwater, 8 surface water, 3 sediment (April 2022)				
Laboratory:	ALS (Brisbane), NMI (Sydney)	Project Manager:	██████████		
Lab reference:	ET2201060, ET2201357, ET2201358, ET2201359, ET2202340, RN1345718, RN1350924				
Key Issues:	No QA/QC issues were identified in the field or laboratory datasets that could have a material implication on data interpretation and therefore decision-making on the project. The data are considered appropriate for use to meet the project objectives.				
Field QA/QC					
Sampling personnel	Sampling was conducted by AECOM personnel from 18 February 2022, 28 February 2022 and 2 to 4 March 2022. Additional sampling was conducted by AECOM personnel on the 22 and 26 April 2022.				
Sampling Methodology	Samples were collected using appropriate methods as identified within the main body of the report. Hydrasleeves were installed in the well for a minimum of 24 hours prior to collection.				
Chain of Custody (COC)	COC documents completed as per AECOM procedures.				
Rinsate Blank	Rinsate blank samples were collected at a frequency of one per field staff per day of sampling (nine in total). Concentrations of all analytes tested were reported below the LOR for rinsate samples.				
Trip Blanks	Trip blank samples were submitted to the laboratory at a rate of one per batch of primary samples delivered to the laboratory (two in total). Concentrations were reported below the LOR for all analytes tested in the trip blank. Trip blanks were not submitted for batches where samples on private properties were collected.				
Eskies to Laboratory	A total of four eskies of samples in two deliveries were submitted to ALS across the sampling event. Two eskies were submitted to NMI.				
Frequency of field QC	Field duplicates (inter-laboratory duplicates) and triplicates (inter-laboratory duplicates) were collected at a target frequency of one in ten primary samples (four duplicates and triplicates for groundwater, four duplicates and triplicates for surface water and three duplicates and triplicates for sediment). The target frequency of 10% for field duplicates and triplicates was achieved for groundwater and surface water and slightly below 10% for sediment.				
Handling and preservation	Primary, duplicate and triplicate samples were received preserved and chilled at the laboratory. Sample receipt temperature was reported between 6.1°C and 10.8°C. All samples were received at the laboratory in appropriate sample containers with no sample container / preservation non-compliances noted.				
Equipment Calibration	Calibration of the water quality meter was conducted each day before sampling, see Appendix F .				

Laboratory QA/QC

Tests requested/reported	Samples were analysed and reported as requested on the COC.
Holding time compliance	Samples were extracted and analysed within recommended holding times.
Laboratory Accreditation	The laboratory analysis was conducted by ALS Environmental Pty Ltd (Brisbane) a National Association of Testing Authorities (NATA) accredited laboratory. The triplicate samples were analysed at the National Measurement Institute (Sydney), also a NATA accredited laboratory.
Frequency of laboratory QC	<p>The laboratory reported sufficient frequency of quality control samples to assess whether the results have been reported to an acceptable accuracy and precision, except:</p> <ul style="list-style-type: none"> Laboratory duplicates for PFAS in water (8.45%) were below the expected rate of 10% in ET2201359. Laboratory duplicates for PFAS in water (7.65%) were below the expected rate of 10% in ET2201060. Matrix spikes for PFAS in water (0.00%) were below the expected rate of 5% in ET2201060.
Method Blank	No method blank value outliers were reported.
Laboratory duplicate RPDs	<p>Laboratory duplicate Relative Percentage Differences (RPD) were within control limits for all samples with the exception of:</p> <ul style="list-style-type: none"> perfluorooctane sulfonic acid (PFOS) had an RPD of 26%, above the acceptance limit of 20% for laboratory duplicates. <p>Laboratory duplicates were not performed for batch RN1345718.</p>
Laboratory control spike (LCS) recovery	<p>All LCS recoveries were reported within acceptable limits, except:</p> <ul style="list-style-type: none"> Recoveries associated with water laboratory control sample QC-4195813-002_ET2201060 (10:2 FTS, PFOS, MeFOSA, PFPeS, 6:2 FTS, 8:2 FTS) Recoveries associated with soil laboratory control sample QC-4214937-002_ET2201359 (PFPeS, PFDA) Recoveries associated with water laboratory control sample QC-4217837-002_ET2201359 (PFDA, PFNA, 8:2 FTS) Recoveries associated with water laboratory control sample QC-4217837-002_ET2201357 (MeFOSA, 6:2 FTS) Recoveries associated with water laboratory control sample QC-4217837-002_ET2201358 (MeFOSA, 6:2 FTS) Recoveries associated with soil laboratory control sample QC-4309342-002_ET2202340 (10:2 FTS, PFUnDA, PFDS,PFBA, PFHpA, 4:2 FTS, 8:2 FTS)
Matrix spike recovery	<p>All matrix spike (MS) recoveries were within control limits, except:</p> <ul style="list-style-type: none"> Perfluorohexane sulfonic acid (PFHxS), PFOS, perfluorohexanoic acid (PFHxA) perfluorooctanoic acid (PFOA and perfluorooctane sulfonamide (FOSA) were not determined in soil in batch ET2201359 due to background level being greater than or equal to four times the spike level. PFHxS, PFOS, perfluorobutane sulfonic acid (PFBS) and 6:2 Fluorotelomer sulfonic acid (6:2 FTS) were not determined in soil in batch ET2201358 due to background level being greater than or equal to four times the spike level. Perfluorohexanoic acid (PFHxA), PFHxS and PFOS were not determined in water in batch ET2201358 due to background level being greater than or equal to four times the spike level. Perfluorohexanoic acid (PFHxA), PFHxS and PFOS were not determined in water in batch ET2201357 due to background level being greater than or equal to four times the spike level.

Surrogate spike recovery	No surrogate recovery outliers were reported. High PFAS surrogate recoveries accepted - results corrected for recovery in batch RN1345718.
QA/QC Data Evaluation	
Comparison of Field Observations and Laboratory Results	No anomalous results between field observations and analysis results were noted.
Data transcription	A random 10% check of the laboratory results identified no anomalies within the electronic data, the laboratory reports, and tables generated by AECOM.
Limits of reporting	Limits of Reporting (LORs) were sufficiently low to enable assessment against adopted screening levels. LOR values were adjusted due to sample matrix interference or high analyte concentrations for the following samples: <ul style="list-style-type: none"> • 0229_MW117D_220218 in ET2201060. • 0229_SD144_220301 in ET2201359.
Field duplicate RPDs	Field duplicate RPDs were reported within control limits.
Field triplicate RPDs	Field triplicate RPDs were reported within control limits for all sample sets with the exception of the following (the sample with the higher concentration is in bold): <ul style="list-style-type: none"> • PFHxS in 0229_MW220S_220303 and 0229_QC207_220303. • PFOS and PFHxS in 0229_SD139_220301 and 0229_QC103_220301. • PFHxS in 0229_SD139_220301 and 0229_QC203_220301 • PFOS and PFHxS in 0229_MW138_220303 and 0229_QC208_220303. <p>Triplicate concentrations were within the same order of magnitude compared to the concentrations in the primary sample and this is not considered to impact interpretation of results. The variability between the primary and triplicate results is inferred to be the result of slight differences in analytical methods employed by the two laboratories. This is demonstrated through the laboratory duplicate results all being within acceptable limits.</p>

Table C1 - Groundwater Duplicate and Triplicate Results

Lab Report Number	ET2201359	ET2201359		ET2201359	ET2201359		ET2201359	ET2201359		ET2201359	ET2201359	
Field ID	0229_MW217_220303	0229_QC106_220303	RPD	0229_MW220S_220303	0229_QC107_220303	RPD	0229_MW138_220303	0229_QC108_220303	RPD	0229_MW102_220303	0229_QC109_220303	RPD
Sampled Date/Time	3/03/2022 11:12	3/03/2022 11:12		3/03/2022 12:28	3/03/2022 12:28		3/03/2022 14:39	3/03/2022 14:39		3/03/2022 15:52	3/03/2022 15:52	
ChemName	Units	EQL										
PFAS Full Suite												
Sum of PFAS (WA DER List)	µg/L	0.01										
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	µg/L	0.05 : 0.01 (Interlab)	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	µg/L	0.05 : 0.01 (Interlab)	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05
6:2 Fluorotelomer Sulfonate (6:2 Fts)	µg/L	0.05 : 0.01 (Interlab)	0.06	0.06	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	µg/L	0.05 : 0.01 (Interlab)	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	µg/L	0.05 : 0.02 (Interlab)	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	µg/L	0.02 : 0.01 (Interlab)	<0.02	<0.02	0	<0.02	<0.02	0	<0.02	<0.02	0	<0.02
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
N-Methyl perfluorooctane sulfonamide (MeFOSA)	µg/L	0.05 : 0.02 (Interlab)	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05
N-Methyl perfluorooctane sulfonamidoacetic acid (MFOSAA)	µg/L	0.02 : 0.01 (Interlab)	<0.02	<0.02	0	<0.02	<0.02	0	<0.02	<0.02	0	<0.02
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
Perfluorobutane sulfonic acid (PFBS)	µg/L	0.02 : 0.01 (Interlab)	<0.02	<0.02	0	0.13	0.12	8	0.88	0.86	2	0.47
Perfluorobutanoic acid (PFBA)	µg/L	0.1 : 0.05 (Interlab)	<0.1	<0.1	0	<0.1	<0.1	0	0.1	0.2	67	<0.1
Perfluorodecanesulfonic acid (PFDS)	µg/L	0.02 : 0.01 (Interlab)	<0.02	<0.02	0	<0.02	<0.02	0	<0.02	<0.02	0	<0.02
Perfluorodecanoic acid (PFDA)	µg/L	0.02 : 0.01 (Interlab)	<0.02	<0.02	0	<0.02	<0.02	0	<0.02	<0.02	0	<0.02
Perfluorododecanoic acid (PFDoDA)	µg/L	0.02 : 0.01 (Interlab)	<0.02	<0.02	0	<0.02	<0.02	0	<0.02	<0.02	0	<0.02
Perfluoroheptane sulfonic acid (PFHpS)	µg/L	0.02 : 0.01 (Interlab)	<0.02	<0.02	0	<0.02	<0.02	0	0.4	0.4	0	0.17
Perfluoroheptanoic acid (PFHpA)	µg/L	0.02 : 0.01 (Interlab)	<0.02	<0.02	0	<0.02	<0.02	0	0.19	0.17	11	0.08
Perfluorohexanoic acid (PFHxA)	µg/L	0.02 : 0.01 (Interlab)	<0.02	<0.02	0	<0.02	<0.02	0	1.21	1.22	1	0.37
Perfluorononanoic acid (PFNA)	µg/L	0.02 : 0.01 (Interlab)	<0.02	<0.02	0	<0.02	<0.02	0	0.04	0.04	0	<0.02
Perfluorooctane sulfonamide (FOSA)	µg/L	0.02 : 0.01 (Interlab)	<0.02	<0.02	0	<0.02	<0.02	0	<0.02	<0.02	0	<0.02
Perfluoropentane sulfonic acid (PFPeS)	µg/L	0.02 : 0.01 (Interlab)	<0.02	<0.02	0	0.08	0.1	22	0.77	0.82	6	0.38
Perfluoropentanoic acid (PFPeA)	µg/L	0.02	<0.02	<0.02	0	<0.02	<0.02	0	0.22	0.23	4	0.09
Perfluorotetradecanoic acid (PFTeDA)	µg/L	0.05 : 0.02 (Interlab)	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05
Perfluorotridecanoic acid (PFTrDA)	µg/L	0.02	<0.02	<0.02	0	<0.02	<0.02	0	<0.02	<0.02	0	<0.02
Perfluoroundecanoic acid (PFUnDA)	µg/L	0.02 : 0.01 (Interlab)	<0.02	<0.02	0	<0.02	<0.02	0	<0.02	<0.02	0	<0.02
Sum of PFAS	µg/L	0.01	0.16	0.15	6	0.69	0.73	6	16.4	16.5	1	5.48
Sum of PFHxS and PFOS	µg/L	0.01	0.1	0.09	11	0.48	0.51	6	12.3	12.2	1	3.74
Perfluorooctane sulfonic acid (PFOS)	µg/L	0.01 : 0.02 (Interlab)	0.08	0.07	13	0.01	0.02	67	7.09	6.99	1	1.47
Perfluorooctanoic Acid (PFOA)	µg/L	0.01	<0.01	<0.01	0	<0.01	<0.01	0	0.34	0.36	6	0.18
Perfluorohexane sulfonic acid (PFHxS)	µg/L	0.01	0.02	0.02	0	0.47	0.49	4	5.17	5.2	1	2.27

Table C1 - Groundwater Duplicate and Triplicate Results

Lab Report Number	ET2201359	RN1345718		ET2201359	RN1345718		ET2201359	RN1345718		ET2201359	RN1345718	
Field ID	0229_MW220S_220303	0229_QC207_220303	RPD	0229_MW102_220303	0229_QC209_220303	RPD	0229_MW217_220303	0229_QC206_220303	RPD	0229_MW138_220303	0229_QC208_220303	RPD
Sampled Date/Time	3/03/2022 12:28	3/03/2022 12:28		3/03/2022 15:52	3/03/2022 15:52		3/03/2022 11:12	3/03/2022 11:12		3/03/2022 14:39	3/03/2022 14:39	
ChemName	Units	EQL										
PFAS Full Suite												
Sum of PFAS (WA DER List)	µg/L	0.01										
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	µg/L	0.05 : 0.01 (Interlab)	<0.05	<0.01	0	<0.05	<0.01	0	<0.05	<0.01	0	<0.05
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	µg/L	0.05 : 0.01 (Interlab)	<0.05	<0.01	0	<0.05	<0.01	0	<0.05	<0.01	0	<0.05
6:2 Fluorotelomer Sulfonate (6:2 Fts)	µg/L	0.05 : 0.01 (Interlab)	<0.05	<0.01	0	<0.05	0.015	0	<0.05	0.035	53	<0.05
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	µg/L	0.05 : 0.01 (Interlab)	<0.05	<0.01	0	<0.05	<0.01	0	<0.05	<0.01	0	<0.05
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	µg/L	0.05 : 0.02 (Interlab)	<0.05	<0.02	0	<0.05	<0.02	0	<0.05	<0.02	0	<0.05
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	µg/L	0.02 : 0.01 (Interlab)	<0.02	<0.01	0	<0.02	<0.01	0	<0.02	<0.01	0	<0.02
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
N-Methyl perfluorooctane sulfonamide (MeFOSA)	µg/L	0.05 : 0.02 (Interlab)	<0.05	<0.02	0	<0.05	<0.02	0	<0.05	<0.02	0	<0.05
N-Methyl perfluorooctane sulfonamidoacetic acid (MFOSAA)	µg/L	0.02 : 0.01 (Interlab)	<0.02	<0.01	0	<0.02	<0.01	0	<0.02	<0.01	0	<0.02
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
Perfluorobutane sulfonic acid (PFBS)	µg/L	0.02 : 0.01 (Interlab)	0.13	0.11	17	0.47	0.47	0	<0.02	0.015	0	0.88
Perfluorobutanoic acid (PFBA)	µg/L	0.1 : 0.05 (Interlab)	<0.1	<0.05	0	<0.1	0.12	18	<0.1	<0.05	0	0.1
Perfluorodecanesulfonic acid (PFDS)	µg/L	0.02 : 0.01 (Interlab)	<0.02	<0.01	0	<0.02	<0.01	0	<0.02	<0.01	0	<0.02
Perfluorodecanoic acid (PFDA)	µg/L	0.02 : 0.01 (Interlab)	<0.02	<0.01	0	<0.02	<0.01	0	<0.02	<0.01	0	<0.02
Perfluorododecanoic acid (PFDoDA)	µg/L	0.02 : 0.01 (Interlab)	<0.02	<0.01	0	<0.02	<0.01	0	<0.02	<0.01	0	<0.02
Perfluoroheptane sulfonic acid (PFHpS)	µg/L	0.02 : 0.01 (Interlab)	<0.02	<0.01	0	0.17	0.14	19	<0.02	<0.01	0	0.4
Perfluoroheptanoic acid (PFHpA)	µg/L	0.02 : 0.01 (Interlab)	<0.02	<0.01	0	0.08	0.086	7	<0.02	<0.01	0	0.19
Perfluorohexanoic acid (PFHxA)	µg/L	0.02 : 0.01 (Interlab)	<0.02	<0.01	0	0.37	0.3	21	<0.02	<0.01	0	1.21
Perfluorononanoic acid (PFNA)	µg/L	0.02 : 0.01 (Interlab)	<0.02	<0.01	0	<0.02	<0.01	0	<0.02	<0.01	0	0.04
Perfluorooctane sulfonamide (FOSA)	µg/L	0.02 : 0.01 (Interlab)	<0.02	<0.01	0	<0.02	<0.01	0	<0.02	<0.01	0	<0.02
Perfluoropentane sulfonic acid (PFPeS)	µg/L	0.02 : 0.01 (Interlab)	0.08	0.074	8	0.38	0.37	3	<0.02	<0.01	0	0.77
Perfluoropentanoic acid (PFPeA)	µg/L	0.02	<0.02	<0.02	0	0.09	0.11	20	<0.02	<0.02	0	0.22
Perfluorotetradecanoic acid (PFTeDA)	µg/L	0.05 : 0.02 (Interlab)	<0.05	<0.02	0	<0.05	<0.02	0	<0.05	<0.02	0	<0.05
Perfluorotridecanoic acid (PFTTrDA)	µg/L	0.02	<0.02	<0.02	0	<0.02	<0.02	0	<0.02	<0.02	0	<0.02
Perfluoroundecanoic acid (PFUnDA)	µg/L	0.02 : 0.01 (Interlab)	<0.02	<0.01	0	<0.02	<0.01	0	<0.02	<0.01	0	<0.02
Sum of PFAS	µg/L	0.01	0.69			5.48			0.16			16.4
Sum of PFHxS and PFOS	µg/L	0.01	0.48			3.74			0.1			12.3
Perfluorooctane sulfonic acid (PFOS)	µg/L	0.01 : 0.02 (Interlab)	0.01	<0.02	0	1.47	1.5	2	0.08	0.043	60	7.09
Perfluorooctanoic Acid (PFOA)	µg/L	0.01	<0.01	<0.01	0	0.18	0.12	40	<0.01	<0.01	0	0.34
Perfluorohexane sulfonic acid (PFHxS)	µg/L	0.01	0.47	0.33	35	2.27	2.2	3	0.02	0.017	16	5.17

Table C2 - Surface Water Duplicate and Triplicate Results

Lab Report Number	ET2201359		ET2201359		ET2201359		ET2201359		ET2201359		ET2201359		ET2202340		ET2202340	
Field ID	0229_SW139_220301	0229_QC102_220301	RPD	0229_SW244_220228	0229_QC100_220228	RPD	0229_SW203_220302	0229_QC104_220302	RPD	0229_SW129_220422	0229_QC150_220422	RPD	0229_SW129_220422	0229_QC150_220422	RPD	
Sampled Date/Time	1/03/2022 12:53	1/03/2022 12:53		28/02/2022 10:20	28/02/2022 10:20		2/03/2022 12:00	2/03/2022 12:00		22/04/2022 15:07	22/04/2022 15:07					
ChemName	Units	EQL														
PFAS Full Suite																
Sum of PFAS (WA DER List)	µg/L	0.01	1.02	1.01	1								0.09	0.09	0	
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	µg/L	0.05 : 0.01 (Interlab)	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	<0.05	0	
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	µg/L	0.05 : 0.01 (Interlab)	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	<0.05	0	
6:2 Fluorotelomer Sulfonate (6:2 FIS)	µg/L	0.05 : 0.01 (Interlab)	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	<0.05	0	
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	µg/L	0.05 : 0.01 (Interlab)	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	<0.05	0	
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	µg/L	0.05 : 0.02 (Interlab)	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	<0.05	0	
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	µg/L	0.02 : 0.01 (Interlab)	<0.02	<0.02	0	<0.02	<0.02	0	<0.02	<0.02	0	<0.02	<0.02	<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	<0.05	0	
N-Methyl perfluorooctane sulfonamide (MeFOSA)	µg/L	0.05 : 0.02 (Interlab)	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	<0.05	0	
N-Methyl perfluorooctane sulfonamidoacetic acid (MFOSAA)	µg/L	0.02 : 0.01 (Interlab)	<0.02	<0.02	0	<0.02	<0.02	0	<0.02	<0.02	0	<0.02	<0.02	<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	<0.05	0	
Perfluorobutane sulfonic acid (PFBS)	µg/L	0.02 : 0.01 (Interlab)	0.05	0.05	0	<0.02	<0.02	0	0.06	0.05	18	<0.02	<0.02	<0.02	0	
Perfluorobutanoic acid (PFBA)	µg/L	0.1 : 0.05 (Interlab)	<0.1	<0.1	0	<0.1	<0.1	0	<0.1	<0.1	0	<0.1	<0.1	<0.1	0	
Perfluorodecanesulfonic acid (PFDS)	µg/L	0.02 : 0.01 (Interlab)	<0.02	<0.02	0	<0.02	<0.02	0	<0.02	<0.02	0	<0.02	<0.02	<0.02	0	
Perfluorodecanoic acid (PFDA)	µg/L	0.02 : 0.01 (Interlab)	<0.02	<0.02	0	<0.02	<0.02	0	<0.02	<0.02	0	<0.02	<0.02	<0.02	0	
Perfluorododecanoic acid (PFDoDA)	µg/L	0.02 : 0.01 (Interlab)	<0.02	<0.02	0	<0.02	<0.02	0	<0.02	<0.02	0	<0.02	<0.02	<0.02	0	
Perfluoroheptane sulfonic acid (PFHpS)	µg/L	0.02 : 0.01 (Interlab)	<0.02	<0.02	0	<0.02	<0.02	0	<0.02	<0.02	0	<0.02	<0.02	<0.02	0	
Perfluoroheptanoic acid (PFHpA)	µg/L	0.02 : 0.01 (Interlab)	<0.02	<0.02	0	<0.02	<0.02	0	<0.02	<0.02	0	<0.02	<0.02	<0.02	0	
Perfluorohexanoic acid (PFHxA)	µg/L	0.02 : 0.01 (Interlab)	0.08	0.08	0	<0.02	<0.02	0	0.03	0.03	0	<0.02	<0.02	<0.02	0	
Perfluorononanoic acid (PFNA)	µg/L	0.02 : 0.01 (Interlab)	<0.02	<0.02	0	<0.02	<0.02	0	<0.02	<0.02	0	<0.02	<0.02	<0.02	0	
Perfluorooctane sulfonamide (FOSA)	µg/L	0.02 : 0.01 (Interlab)	<0.02	<0.02	0	<0.02	<0.02	0	<0.02	<0.02	0	<0.02	<0.02	<0.02	0	
Perfluoropentane sulfonic acid (PFPeS)	µg/L	0.02 : 0.01 (Interlab)	0.04	0.04	0	<0.02	<0.02	0	0.02	0.02	0	<0.02	<0.02	<0.02	0	
Perfluoropentanoic acid (PFPeA)	µg/L	0.02	<0.02	<0.02	0	<0.02	<0.02	0	<0.02	<0.02	0	<0.02	<0.02	<0.02	0	
Perfluorotetradecanoic acid (PFTeDA)	µg/L	0.05 : 0.02 (Interlab)	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	<0.05	0	
Perfluorotridecanoic acid (PFTrDA)	µg/L	0.02	<0.02	<0.02	0	<0.02	<0.02	0	<0.02	<0.02	0	<0.02	<0.02	<0.02	0	
Perfluoroundecanoic acid (PFUnDA)	µg/L	0.02 : 0.01 (Interlab)	<0.02	<0.02	0	<0.02	<0.02	0	<0.02	<0.02	0	<0.02	<0.02	<0.02	0	
Sum of PFAS	µg/L	0.01	1.06	1.05	1	<0.01	<0.01	0	0.65	0.58	11	0.09	0.09	0.09	0	
Sum of PFHxS and PFOS	µg/L	0.01	0.86	0.85	1	<0.01	<0.01	0	0.53	0.47	12	0.09	0.09	0.09	0	
Perfluorooctane sulfonic acid (PFOS)	µg/L	0.01 : 0.02 (Interlab)	0.55	0.54	2	<0.01	<0.01	0	0.3	0.26	14	0.03	0.03	0.03	0	
Perfluorooctanoic Acid (PFOA)	µg/L	0.01	0.03	0.03	0	<0.01	<0.01	0	0.01	0.01	0	<0.01	<0.01	<0.01	0	
Perfluorohexane sulfonic acid (PFHxS)	µg/L	0.01	0.31	0.31	0	<0.01	<0.01	0	0.23	0.21	9	0.06	0.06	0.06	0	

Table C2 - Surface Water Duplicate and Triplicate Results

ChemName	Units	EQL	ET2201359			RN1345718			ET2201359			RN1345718		
			Field ID	Sampled Date/Time	RPD	Field ID	Sampled Date/Time	RPD	Field ID	Sampled Date/Time	RPD	Field ID	Sampled Date/Time	RPD
Sum of PFAS (WA DER List)	µg/L	0.01												
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	µg/L	0.05 : 0.01 (Interlab)	<0.05	<0.01	0	<0.05	<0.01	0	<0.05	<0.01	0	<0.05	<0.01	0
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	µg/L	0.05 : 0.01 (Interlab)	<0.05	<0.01	0	<0.05	<0.01	0	<0.05	<0.01	0	<0.05	<0.01	0
6:2 Fluorotelomer Sulfonate (6:2 FTS)	µg/L	0.05 : 0.01 (Interlab)	<0.05	<0.01	0	<0.05	<0.01	0	<0.05	<0.01	0	<0.05	<0.01	0
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	µg/L	0.05 : 0.01 (Interlab)	<0.05	<0.01	0	<0.05	<0.01	0	<0.05	<0.01	0	<0.05	<0.01	0
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	µg/L	0.05 : 0.02 (Interlab)	<0.05	<0.02	0	<0.05	<0.02	0	<0.05	<0.02	0	<0.05	<0.02	0
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	µg/L	0.02 : 0.01 (Interlab)	<0.02	<0.01	0	<0.02	<0.01	0	<0.02	<0.01	0	<0.02	<0.01	0
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	µg/L	0.05	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0
N-Methyl perfluorooctane sulfonamide (MeFOSA)	µg/L	0.05 : 0.02 (Interlab)	<0.05	<0.02	0	<0.05	<0.02	0	<0.05	<0.02	0	<0.05	<0.02	0
N-Methyl perfluorooctane sulfonamidoacetic acid (MFOSAA)	µg/L	0.02 : 0.01 (Interlab)	<0.02	<0.01	0	<0.02	<0.01	0	<0.02	<0.01	0	<0.02	<0.01	0
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	µg/L	0.05	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0
Perfluorobutane sulfonic acid (PFBS)	µg/L	0.02 : 0.01 (Interlab)	<0.02	<0.01	0	0.06	0.054	11	0.05	0.054	8	0.05	0.054	8
Perfluorobutanoic acid (PFBA)	µg/L	0.1 : 0.05 (Interlab)	<0.1	<0.05	0	<0.1	<0.05	0	<0.1	<0.05	0	<0.1	<0.05	0
Perfluorodecanesulfonic acid (PFDS)	µg/L	0.02 : 0.01 (Interlab)	<0.02	<0.01	0	<0.02	<0.01	0	<0.02	<0.01	0	<0.02	<0.01	0
Perfluorodecanoic acid (PFDA)	µg/L	0.02 : 0.01 (Interlab)	<0.02	<0.01	0	<0.02	<0.01	0	<0.02	<0.01	0	<0.02	<0.01	0
Perfluorododecanoic acid (PFDoDA)	µg/L	0.02 : 0.01 (Interlab)	<0.02	<0.01	0	<0.02	<0.01	0	<0.02	<0.01	0	<0.02	<0.01	0
Perfluoroheptane sulfonic acid (PFHpS)	µg/L	0.02 : 0.01 (Interlab)	<0.02	<0.01	0	<0.02	<0.01	0	<0.02	<0.01	0	<0.02	0.013	0
Perfluoroheptanoic acid (PFHpA)	µg/L	0.02 : 0.01 (Interlab)	<0.02	<0.01	0	<0.02	<0.01	0	<0.02	<0.01	0	<0.02	<0.01	0
Perfluorohexanoic acid (PFHxA)	µg/L	0.02 : 0.01 (Interlab)	<0.02	<0.01	0	0.03	0.025	18	0.08	0.08	0	0.08	0.08	0
Perfluorononanoic acid (PFNA)	µg/L	0.02 : 0.01 (Interlab)	<0.02	<0.01	0	<0.02	<0.01	0	<0.02	<0.01	0	<0.02	<0.01	0
Perfluorooctane sulfonamide (FOSA)	µg/L	0.02 : 0.01 (Interlab)	<0.02	<0.01	0	<0.02	<0.01	0	<0.02	<0.01	0	<0.02	<0.01	0
Perfluoropentane sulfonic acid (PFPeS)	µg/L	0.02 : 0.01 (Interlab)	<0.02	<0.01	0	0.02	0.025	22	0.04	0.039	3	0.04	0.039	3
Perfluoropentanoic acid (PFPeA)	µg/L	0.02	<0.02	<0.02	0	<0.02	<0.02	0	<0.02	<0.02	0	<0.02	<0.02	0
Perfluorotetradecanoic acid (PFTeDA)	µg/L	0.05 : 0.02 (Interlab)	<0.05	<0.02	0	<0.05	<0.02	0	<0.05	<0.02	0	<0.05	<0.02	0
Perfluorotridecanoic acid (PFTrDA)	µg/L	0.02	<0.02	<0.02	0	<0.02	<0.02	0	<0.02	<0.02	0	<0.02	<0.02	0
Perfluoroundecanoic acid (PFUnDA)	µg/L	0.02 : 0.01 (Interlab)	<0.02	<0.01	0	<0.02	<0.01	0	<0.02	<0.01	0	<0.02	<0.01	0
Sum of PFAS	µg/L	0.01	<0.01			0.65			1.06					
Sum of PFHxS and PFOS	µg/L	0.01	<0.01			0.53			0.86					
Perfluorooctane sulfonic acid (PFOS)	µg/L	0.01 : 0.02 (Interlab)	<0.01	<0.02	0	0.3	0.25	18	0.55	0.59	7	0.55	0.59	7
Perfluorooctanoic Acid (PFOA)	µg/L	0.01	<0.01	<0.01	0	0.01	0.015	40	0.03	0.02	40	0.03	0.02	40
Perfluorohexane sulfonic acid (PFHxS)	µg/L	0.01	<0.01	<0.01	0	0.23	0.23	0	0.31	0.34	9	0.31	0.34	9

Table C3 - Sediment Duplicate and Triplicate Results

Lab Report Number	ET2201359	ET2201359	ET2201359	ET2201359	ET2201359	ET2201359	ET2201359	ET2201359	ET2201359	ET2201359	ET2201359	ET2201359	RN1345718
Field ID	0229_SD139_220301	0229_QC103_220301	RPD	0229_SD244_220228	0229_QC101_220228	RPD	0229_SD203_220302	0229_QC105_220302	RPD	0229_SD203_220302	0229_QC205_220302	RPD	0229_QC205_220302
Sampled Date/Time	1/03/2022 12:54	1/03/2022 12:54		28/02/2022 10:20	28/02/2022 10:20		2/03/2022 12:00	2/03/2022 12:00		2/03/2022 12:00	2/03/2022 12:00		2/03/2022 12:00
ChemName	Units	EQL											
PFAS Full Suite													
Sum of PFAS (WA DER List)	mg/kg	0.0002	0.0772	0.0406	62								
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	mg/kg	0.0005 : 0.002 (Interlab)	<0.0005	<0.0005	0	<0.0005	<0.0005	0	<0.0005	<0.0005	0	<0.0005	<0.002
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	mg/kg	0.0005 : 0.001 (Interlab)	<0.0005	<0.0005	0	<0.0005	<0.0005	0	<0.0005	<0.0005	0	<0.0005	<0.001
6:2 Fluorotelomer Sulfonate (6:2 FTS)	mg/kg	0.0005 : 0.001 (Interlab)	<0.0005	<0.0005	0	<0.0005	<0.0005	0	<0.0005	<0.0005	0	<0.0005	<0.001
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	mg/kg	0.0005 : 0.001 (Interlab)	<0.0005	<0.0005	0	<0.0005	<0.0005	0	<0.0005	<0.0005	0	<0.0005	<0.001
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	mg/kg	0.0005 : 0.002 (Interlab)	<0.0005	<0.0005	0	<0.0005	<0.0005	0	<0.0005	<0.0005	0	<0.0005	<0.002
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	mg/kg	0.0002 : 0.002 (Interlab)	<0.0002	<0.0002	0	<0.0002	<0.0002	0	<0.0002	<0.0002	0	<0.0002	<0.002
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	mg/kg	0.0005 : 0.005 (Interlab)	<0.0005	<0.0005	0	<0.0005	<0.0005	0	<0.0005	<0.0005	0	<0.0005	<0.005
N-Methyl perfluorooctane sulfonamide (MeFOSA)	mg/kg	0.0005 : 0.002 (Interlab)	<0.0005	<0.0005	0	<0.0005	<0.0005	0	<0.0005	<0.0005	0	<0.0005	<0.002
N-Methyl perfluorooctane sulfonamidoacetic acid (MFOSAA)	mg/kg	0.0002 : 0.002 (Interlab)	<0.0002	<0.0002	0	<0.0002	<0.0002	0	<0.0002	<0.0002	0	<0.0002	<0.002
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	mg/kg	0.0005 : 0.005 (Interlab)	<0.0005	<0.0005	0	<0.0005	<0.0005	0	<0.0005	<0.0005	0	<0.0005	<0.005
Perfluorobutane sulfonic acid (PFBS)	mg/kg	0.0002 : 0.001 (Interlab)	0.0002	<0.0002	0	<0.0002	<0.0002	0	<0.0002	<0.0002	0	<0.0002	<0.001
Perfluorobutanoic acid (PFBA)	mg/kg	0.001	<0.001	<0.001	0	<0.001	<0.001	0	<0.001	<0.001	0	<0.001	<0.002
Perfluorodecanesulfonic acid (PFDS)	mg/kg	0.0002	0.0004	<0.0003	29	<0.0002	<0.0002	0	<0.0002	<0.0002	0	<0.0002	<0.001
Perfluorodecanoic acid (PFDA)	mg/kg	0.0002 : 0.001 (Interlab)	<0.0002	<0.0002	0	<0.0002	<0.0002	0	<0.0002	<0.0002	0	<0.0002	<0.001
Perfluorododecanoic acid (PFDoDA)	mg/kg	0.0002 : 0.002 (Interlab)	<0.0002	<0.0002	0	<0.0002	<0.0002	0	<0.0002	<0.0002	0	<0.0002	<0.002
Perfluoroheptane sulfonic acid (PFHpS)	mg/kg	0.0002 : 0.001 (Interlab)	0.0015	0.0008	61	<0.0002	<0.0002	0	<0.0002	<0.0002	0	<0.0002	<0.001
Perfluoroheptanoic acid (PFHpA)	mg/kg	0.0002 : 0.001 (Interlab)	<0.0002	<0.0002	0	<0.0002	<0.0002	0	<0.0002	<0.0002	0	<0.0002	<0.001
Perfluorohexanoic acid (PFHxA)	mg/kg	0.0002 : 0.001 (Interlab)	0.0004	0.0002	67	<0.0002	<0.0002	0	<0.0002	<0.0002	0	<0.0002	<0.001
Perfluorononanoic acid (PFNA)	mg/kg	0.0002 : 0.001 (Interlab)	<0.0002	<0.0002	0	<0.0002	<0.0002	0	<0.0002	<0.0002	0	<0.0002	<0.001
Perfluorooctane sulfonamide (FOSA)	mg/kg	0.0002 : 0.001 (Interlab)	<0.0002	<0.0002	0	<0.0002	<0.0002	0	<0.0002	<0.0002	0	<0.0002	<0.001
Perfluoropentane sulfonic acid (PFPeS)	mg/kg	0.0002 : 0.001 (Interlab)	0.0003	<0.0002	40	<0.0002	<0.0002	0	<0.0002	<0.0002	0	<0.0002	<0.001
Perfluoropentanoic acid (PFPeA)	mg/kg	0.0002 : 0.002 (Interlab)	<0.0002	<0.0002	0	<0.0002	<0.0002	0	<0.0002	<0.0002	0	<0.0002	<0.002
Perfluorotetradecanoic acid (PFTeDA)	mg/kg	0.0005 : 0.002 (Interlab)	<0.0005	<0.0005	0	<0.0005	<0.0005	0	<0.0005	<0.0005	0	<0.0005	<0.002
Perfluorotridecanoic acid (PFTrDA)	mg/kg	0.0002 : 0.002 (Interlab)	<0.0002	<0.0002	0	<0.0002	<0.0002	0	<0.0002	<0.0002	0	<0.0002	<0.002
Perfluoroundecanoic acid (PFUnDA)	mg/kg	0.0002 : 0.002 (Interlab)	<0.0002	<0.0002	0	<0.0002	<0.0002	0	<0.0002	<0.0002	0	<0.0002	<0.002
Sum of PFAS	mg/kg	0.0002	0.0794	0.0414	63	<0.0002	<0.0002	0	0.0002	0.0003	40	0.0002	
Sum of PFHxS and PFOS	mg/kg	0.0002	0.0762	0.0402	62	<0.0002	<0.0002	0	0.0002	0.0003	40	0.0002	
Perfluorooctane sulfonic acid (PFOS)	mg/kg	0.0002 : 0.002 (Interlab)	0.0705	0.0365	64	<0.0002	<0.0002	0	0.0002	0.0003	40	0.0002	<0.002
Perfluorooctanoic Acid (PFOA)	mg/kg	0.0002 : 0.001 (Interlab)	0.0004	0.0002	67	<0.0002	<0.0002	0	<0.0002	<0.0002	0	<0.0002	<0.001
Perfluorohexane sulfonic acid (PFHxS)	mg/kg	0.0002 : 0.001 (Interlab)	0.0057	0.0037	43	<0.0002	<0.0002	0	<0.0002	<0.0002	0	<0.0002	<0.001
Moisture Content	%	0.1	40	46	14	17.6	15.3	14	22.7	21.2	7	22.7	

Table C3 - Sediment Duplicate and Triplicate Results

Lab Report Number	ET2201359	RN1345718		ET2201359	RN1345718	
Field ID	0229_SD244_220228	0229_QC201_220228	RPD	0229_SD139_220301	0229_QC203_220301	RPD
Sampled Date/Time	28/02/2022 10:20	28/02/2022 10:20		1/03/2022 12:54	1/03/2022 12:54	
ChemName	Units	EQL				
PFAS Full Suite						
Sum of PFAS (WA DER List)	mg/kg	0.0002			0.0772	
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	mg/kg	0.0005 : 0.002 (Interlab)	<0.0005	<0.002	0	<0.0005 <0.002 0
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	mg/kg	0.0005 : 0.001 (Interlab)	<0.0005	<0.001	0	<0.0005 <0.001 0
6:2 Fluorotelomer Sulfonate (6:2 FTS)	mg/kg	0.0005 : 0.001 (Interlab)	<0.0005	<0.001	0	<0.0005 <0.001 0
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	mg/kg	0.0005 : 0.001 (Interlab)	<0.0005	<0.001	0	<0.0005 <0.001 0
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	mg/kg	0.0005 : 0.002 (Interlab)	<0.0005	<0.002	0	<0.0005 <0.002 0
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	mg/kg	0.0002 : 0.002 (Interlab)	<0.0002	<0.002	0	<0.0002 <0.002 0
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	mg/kg	0.0005 : 0.005 (Interlab)	<0.0005	<0.005	0	<0.0005 <0.005 0
N-Methyl perfluorooctane sulfonamide (MeFOSA)	mg/kg	0.0005 : 0.002 (Interlab)	<0.0005	<0.002	0	<0.0005 <0.002 0
N-Methyl perfluorooctane sulfonamidoacetic acid (MFOSAA)	mg/kg	0.0002 : 0.002 (Interlab)	<0.0002	<0.002	0	<0.0002 <0.002 0
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	mg/kg	0.0005 : 0.005 (Interlab)	<0.0005	<0.005	0	<0.0005 <0.005 0
Perfluorobutane sulfonic acid (PFBS)	mg/kg	0.0002 : 0.001 (Interlab)	<0.0002	<0.001	0	0.0002 <0.001 0
Perfluorobutanoic acid (PFBA)	mg/kg	0.001	<0.001	<0.002	0	<0.001 <0.002 0
Perfluorodecanesulfonic acid (PFDS)	mg/kg	0.0002	<0.0002	<0.001	0	0.0004 <0.001 0
Perfluorodecanoic acid (PFDA)	mg/kg	0.0002 : 0.001 (Interlab)	<0.0002	<0.001	0	<0.0002 <0.001 0
Perfluorododecanoic acid (PFDoDA)	mg/kg	0.0002 : 0.002 (Interlab)	<0.0002	<0.002	0	<0.0002 <0.002 0
Perfluoroheptane sulfonic acid (PFHpS)	mg/kg	0.0002 : 0.001 (Interlab)	<0.0002	<0.001	0	0.0015 0.0013 14
Perfluoroheptanoic acid (PFHpA)	mg/kg	0.0002 : 0.001 (Interlab)	<0.0002	<0.001	0	<0.0002 <0.001 0
Perfluorohexanoic acid (PFHxA)	mg/kg	0.0002 : 0.001 (Interlab)	<0.0002	<0.001	0	0.0004 <0.001 0
Perfluorononanoic acid (PFNA)	mg/kg	0.0002 : 0.001 (Interlab)	<0.0002	<0.001	0	<0.0002 <0.001 0
Perfluorooctane sulfonamide (FOSA)	mg/kg	0.0002 : 0.001 (Interlab)	<0.0002	<0.001	0	<0.0002 <0.001 0
Perfluoropentane sulfonic acid (PFPeS)	mg/kg	0.0002 : 0.001 (Interlab)	<0.0002	<0.001	0	0.0003 <0.001 0
Perfluoropentanoic acid (PFPeA)	mg/kg	0.0002 : 0.002 (Interlab)	<0.0002	<0.002	0	<0.0002 <0.002 0
Perfluorotetradecanoic acid (PFTeDA)	mg/kg	0.0005 : 0.002 (Interlab)	<0.0005	<0.002	0	<0.0005 <0.002 0
Perfluorotridecanoic acid (PFTrDA)	mg/kg	0.0002 : 0.002 (Interlab)	<0.0002	<0.002	0	<0.0002 <0.002 0
Perfluoroundecanoic acid (PFUnDA)	mg/kg	0.0002 : 0.002 (Interlab)	<0.0002	<0.002	0	<0.0002 <0.002 0
Sum of PFAS	mg/kg	0.0002	<0.0002			0.0794
Sum of PFHxS and PFOS	mg/kg	0.0002	<0.0002			0.0762
Perfluorooctane sulfonic acid (PFOS)	mg/kg	0.0002 : 0.002 (Interlab)	<0.0002	<0.002	0	0.0705 0.087 21
Perfluorooctanoic Acid (PFOA)	mg/kg	0.0002 : 0.001 (Interlab)	<0.0002	<0.001	0	0.0004 <0.001 0
Perfluorohexane sulfonic acid (PFHxS)	mg/kg	0.0002 : 0.001 (Interlab)	<0.0002	<0.001	0	0.0057 0.01 55
Moisture Content	%	0.1		17.6		40

Table C4 - Rinsate and Trip Blank Results

Lab Report Number	ET2202340	ET2201060	ET2201359	ET2201359	ET2201359	ET2201359	ET2201359
Field ID	0229_QC550_220422	0229_QC300_220218	0229_QC301_220301	0229_QC300_220228	0229_QC304_220303	0229_QC305_220303	0229_QC305_220303
Sampled_Date/Time	22/04/2022 8:00	18/02/2022 12:17	1/03/2022 17:38	28/02/2022 12:15	3/03/2022 16:04		3/03/2022 16:17
Sample Type	Field Blank	Rinsate	Rinsate	Rinsate	Rinsate		Rinsate

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

Table C4 - Rinsate and Trip Blank Results

Lab Report Number	ET2201359	ET2201359	ET2202340	ET2202340	ET2201060	ET2201359
Field ID	0229_QC302_220302	0229_QC306_220304	0229_QC350_220422	0229_QC351_220426	0229_QC500_220218	0229_QC500_220304
Sampled_Date/Time	2/03/2022 15:10	4/03/2022 13:00	22/04/2022 15:38	26/04/2022 10:02	18/02/2022 12:24	4/03/2022 14:13
Sample Type	Rinsate	Rinsate	Rinsate	Rinsate	Trip Blank	Trip Blank

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

Appendix D

Chain of Custody Records



Environmental Division
Townsville
Work Order Reference
ET2201359



Telephone: +61 7 4773 0000

Custody Document for Submissions via ALS Compass App

Project: QLD-0229-PFASOMP-20 Client: AECOM

Project Manager: [REDACTED]

Phone: ([REDACTED])

ALS Compass COC Reference: 34488 # Samples: 101

Sampler: [REDACTED]

Phone: ([REDACTED])

Turnaround Requirements: Standard Urgent

Special Instructions:

Treat all samples as [REDACTED] based on previous results when ~~more~~ > 2 bottles provided, complete laboratory QC analysis.

Custody:

<p>Relinquished by: [REDACTED]</p>	<p>Received by: [REDACTED]</p>	<p>Relinquished by: [REDACTED]</p>	<p>Received by: [REDACTED]</p>
<p>Date / Time: 4/3/22 1445</p>	<p>Date / Time: 4/3 3.15pm</p>	<p>Date / Time: [REDACTED]</p>	<p>Date / Time: 08.03.22 09:10</p>

RELINQUISHED BY:
 DATE TIME:

RECEIVED BY:
 DATE TIME:

RELINQUISHED BY:
 DATE TIME:

RECEIVED BY:
 DATE TIME:

CLIENT: AECOMAU - AECOM Australia Pty Ltd

PROJECT: QLD_0229_PFSOMP_20

SITE: QLD_0229

ORDER NO:

PROJECT MANAGER: [REDACTED]

PRIMARY SAMPLER: [REDACTED]

EMAIL REPORTS TO: [REDACTED]

EMAIL INVOICES TO: [REDACTED]

TURNAROUND REQUIREMENTS : 5 Days
 Biohazard info:

CONTACT PH: SAMPLER MOBILE:
 QUOTE NO: TV/007/21 - Compass / ET2021AECOMAU000
 1

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	Analysis NOT REQUIRED	Sediments SEDIMENT	Waters WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
001	0229_SW140_220301		01/03/2022 10:30 AM	Water	ALS: 2 Non ALS: 0	No			Partial 1/4		
002	0229_SD140_220301		01/03/2022 10:30 AM	Soil	ALS: 1 Non ALS: 0	No		Partial 1/4			
003	0229_SW109_220301		01/03/2022 11:11 AM	Water	ALS: 2 Non ALS: 0	No			Partial 1/4		Contamination: Previous results
004	0229_SD109_220301		01/03/2022 11:11 AM	Soil	ALS: 1 Non ALS: 0	No		Partial 1/4			Contamination: Previous results
005	0229_SD110_220301		01/03/2022 11:35 AM	Soil	ALS: 1 Non ALS: 0	No		Partial 1/4			Contamination: Previous results
006	0229_SW110_220301		01/03/2022 11:36 AM	Water	ALS: 2 Non ALS: 0	No			Partial 1/4		Contamination: Previous results
007	0229_SD144_220301		01/03/2022 11:55 AM	Soil	ALS: 1 Non ALS: 0	No		Partial 1/4			
008	0229_SW144_220301		01/03/2022 11:56 AM	Water	ALS: 2 Non ALS: 0	No			Partial 1/4		
009	0229_SW139_220301		01/03/2022 12:53 PM	Water	ALS: 2 Non ALS: 0	No			Partial 1/4		

CLIENT: AECOMAU - AECOM Australia Pty Ltd

PROJECT: QLD_0229_PFASOMP_20

SITE: QLD_0229

ORDER NO:

PROJECT MANAGER: [REDACTED]

PRIMARY SAMPLER: [REDACTED]

EMAIL REPORTS TO: [REDACTED]

EMAIL INVOICES TO: [REDACTED]

RELINQUISHED BY:

DATE TIME:

RECEIVED BY:

DATE TIME:

RELINQUISHED BY:

DATE TIME:

RECEIVED BY:

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:

CONTACT PH: SAMPLER MOBILE:
 QUOTE NO: TV/007/21 - Compass / ET2021AECOMAU000
 1

SAMPLE DETAILS							ANALYSIS REQUIRED				
SAMPLE	NAME	DESCRIPTION	DATE / TIME	MATRIX	TOTAL BOTTLES	ON HOLD	Analysis NOT REQUIRED	Sediments SEDIMENT	Waters WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
010	0229_QC102_220301		01/03/2022 12:54 PM	Water	ALS: 2 Non ALS: 0	No			Partial 1/4		
011	0229_SD139_220301		01/03/2022 12:54 PM	Soil	ALS: 1 Non ALS: 0	No		Partial 1/4			
012	0229_QC103_220301		01/03/2022 12:55 PM	Soil	ALS: 1 Non ALS: 0	No		Partial 1/4			
013	0229_SD113_220301		01/03/2022 01:22 PM	Soil	ALS: 1 Non ALS: 0	No		Partial 1/4			
014	0229_SW113_220301		01/03/2022 01:22 PM	Water	ALS: 2 Non ALS: 0	No			Partial 1/4		
015	0229_SD119_220301		01/03/2022 02:20 PM	Soil	ALS: 1 Non ALS: 0	No		Partial 1/4			
016	0229_SW119_220301		01/03/2022 02:21 PM	Water	ALS: 2 Non ALS: 0	No			Partial 1/4		
017	0229_SD120_220301		01/03/2022 02:35 PM	Soil	ALS: 1 Non ALS: 0	No		Partial 1/4			
018	0229_SW135_220301		01/03/2022 02:47 PM	Water	ALS: 2 Non ALS: 0	No			Partial 1/4		

CLIENT: AECOMAU - AECOM Australia Pty Ltd

PROJECT: QLD_0229_PFSOMP_20

SITE: QLD_0229

ORDER NO:

PROJECT MANAGER: [REDACTED]

PRIMARY SAMPLER: [REDACTED]

EMAIL REPORTS TO: [REDACTED]

EMAIL INVOICES TO: [REDACTED]

RELINQUISHED BY:

DATE TIME:

RECEIVED BY:

DATE TIME:

RELINQUISHED BY:

DATE TIME:

RECEIVED BY:

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:

CONTACT PH: SAMPLER MOBILE:
 QUOTE NO: TV/007/21 - Compass / ET2021AECOMAU000
 1

SAMPLE DETAILS							ANALYSIS REQUIRED				
SAMPLE	NAME	DESCRIPTION	DATE / TIME	MATRIX	TOTAL BOTTLES	ON HOLD	Analysis NOT REQUIRED	Sediments SEDIMENT	Waters WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
019	0229_SD135_220301		01/03/2022 02:48 PM	Soil	ALS: 1 Non ALS: 0	No		Partial 1/4			
020	0229_SW121_220301		01/03/2022 03:14 PM	Water	ALS: 6 Non ALS: 0	No			Partial 1/4		Extra vol for lab QC
021	0229_SD133_220301		01/03/2022 03:27 PM	Soil	ALS: 1 Non ALS: 0	No		Partial 1/4			
022	0229_SD134_220301		01/03/2022 03:39 PM	Soil	ALS: 1 Non ALS: 0	No		Partial 1/4			
023	0229_SW132_220301		01/03/2022 03:53 PM	Water	ALS: 2 Non ALS: 0	No			Partial 1/4		
024	0229_QC301_220301		01/03/2022 05:36 PM	Water	ALS: 2 Non ALS: 0	No			Partial 1/4		
025	0229_MW125S_220302		02/03/2022 09:33 AM	Water	ALS: 2 Non ALS: 0	No			Partial 1/4		Contamination: Previous results
026	0229_MW125I_220302		02/03/2022 09:30 AM	Water	ALS: 2 Non ALS: 0	No			Partial 1/4		Contamination: Previous results
027	0229_MW124_220302		02/03/2022 09:41 AM	Water	ALS: 6 Non ALS: 0	No			Partial 1/4		Contamination: Previous results Extra vol for lab QC

RELINQUISHED BY:
DATE TIME:

RECEIVED BY:
DATE TIME:

RELINQUISHED BY:
DATE TIME:

RECEIVED BY:
DATE TIME:

CLIENT: AECOMAU - AECOM Australia Pty Ltd
 PROJECT: QLD_0229_PFSOMP_20
 SITE: QLD_0229
 ORDER NO:

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

PROJECT MANAGER: [REDACTED]
 PRIMARY SAMPLER: [REDACTED]

CONTACT PH: [REDACTED] SAMPLER MOBILE: [REDACTED]
 QUOTE NO: TV/007/21 - Compass / ET2021AECOMAU0001

Random Sample Temperature on Receipt: °C
 Other comments:

EMAIL REPORTS TO: [REDACTED]

EMAIL INVOICES TO: [REDACTED]

SAMPLE DETAILS							ANALYSIS REQUIRED				
SAMPLE	NAME	DESCRIPTION	DATE / TIME	MATRIX	TOTAL BOTTLES	ON HOLD	ANALYSIS NOT REQUIRED	SEDIMENTS SEDIMENT	WATERS WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
028	0229_SD244_220228		28/02/2022 10:20 AM	Soil	ALS: 1 Non ALS: 0	No		Partial 1/4			
029	0229_SW244_220228		28/02/2022 10:20 AM	Water	ALS: 2 Non ALS: 0	No			Partial 1/4		
030	0229_SD245_220228		28/02/2022 08:45 AM	Soil	ALS: 1 Non ALS: 0	No		Partial 1/4			
031	0229_SW245_220228		28/02/2022 08:45 AM	Water	ALS: 2 Non ALS: 0	No			Partial 1/4		
032	0229_QC100_220228		28/02/2022 10:20 AM	Water	ALS: 2 Non ALS: 0	No			Partial 1/4		
033	0229_QC101_220228		28/02/2022 10:20 AM	Soil	ALS: 1 Non ALS: 0	No		Partial 1/4			
034	0229_QC300_220228		28/02/2022 12:15 PM	Water	ALS: 2 Non ALS: 0	No			Partial 1/4		
035	0229_SW227_220228		28/02/2022 11:30 AM	Water	ALS: 6 Non ALS: 0	No			Partial 1/4		Extra vol for lab QC
036	0229_SD227_220228		28/02/2022 11:30 AM	Soil	ALS: 1 Non ALS: 0	No		Partial 1/4			

CLIENT: AECOMAU - AECOM Australia Pty Ltd

PROJECT: QLD_0229_PFSOMP_20

SITE: QLD_0229

ORDER NO:

PROJECT MANAGER: [REDACTED]

PRIMARY SAMPLER: [REDACTED]

EMAIL REPORTS TO: [REDACTED]

EMAIL INVOICES TO: [REDACTED]

RELINQUISHED BY:

DATE TIME:

RECEIVED BY:

DATE TIME:

RELINQUISHED BY:

DATE TIME:

RECEIVED BY:

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:

CONTACT PH: SAMPLER MOBILE:
 QUOTE NO: TV/007/21 - Compass / ET2021AECOMAU000
 1

SAMPLE DETAILS							ANALYSIS REQUIRED				
SAMPLE	NAME	DESCRIPTION	DATE / TIME	MATRIX	TOTAL BOTTLES	ON HOLD	Analysis NOT REQUIRED	Sediments SEDIMENT	Waters WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
037	0229_MW233_220303		03/03/2022 10:13 AM	Water	ALS: 4 Non ALS: 0	No			Partial 1/4		Extra vol lab qc
038	0229_MW212_220303		03/03/2022 10:30 AM	Water	ALS: 2 Non ALS: 0	No			Partial 1/4		
039	0229_MW217_220303		03/03/2022 11:12 AM	Water	ALS: 2 Non ALS: 0	No			Partial 1/4		
040	0229_QC106_220303		03/03/2022 11:14 AM	Water	ALS: 2 Non ALS: 0	No			Partial 1/4		
041	0229_MW235S_220303		03/03/2022 11:41 AM	Water	ALS: 4 Non ALS: 0	No			Partial 1/4		Extra vol lab qc
042	0229_MW205S_220303		03/03/2022 12:01 PM	Water	ALS: 2 Non ALS: 0	No			Partial 1/4		
043	0229_MW220S_220303		03/03/2022 12:28 PM	Water	ALS: 2 Non ALS: 0	No			Partial 1/4		
044	0229_QC107_220303		03/03/2022 12:28 PM	Water	ALS: 2 Non ALS: 0	No			Partial 1/4		
045	0229_QC303_220303		03/03/2022 12:29 PM	Water	ALS: 2 Non ALS: 0	Yes	-				

CLIENT: AECOMAU - AECOM Australia Pty Ltd

PROJECT: QLD_0229_PFSOMP_20

SITE: QLD_0229

ORDER NO:

PROJECT MANAGER: [REDACTED]

PRIMARY SAMPLER: [REDACTED]

EMAIL REPORTS TO: [REDACTED]

EMAIL INVOICES TO: [REDACTED]

RELINQUISHED BY:

DATE TIME:

RECEIVED BY:

DATE TIME:

RELINQUISHED BY:

DATE TIME:

RECEIVED BY:

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:

CONTACT PH: SAMPLER MOBILE:
 QUOTE NO: TV/007/21 - Compass / ET2021AECOMAU000
 1

SAMPLE DETAILS							ANALYSIS REQUIRED				
SAMPLE	NAME	DESCRIPTION	DATE / TIME	MATRIX	TOTAL BOTTLES	ON HOLD	Analysis NOT REQUIRED	Sediments SEDIMENT	Waters WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
046	0229_MW106_220303		03/03/2022 11:56 AM	Water	ALS: 2 Non ALS: 0	No			Partial 1/4		
047	0229_MW232_220303		03/03/2022 12:56 PM	Water	ALS: 2 Non ALS: 0	No			Partial 1/4		
048	0229_MW131_220303		03/03/2022 01:10 PM	Water	ALS: 6 Non ALS: 0	No			Partial 1/4		Contamination: Previous results Extra vol for lab QC
049	0229_MW072_220303		03/03/2022 01:35 PM	Water	ALS: 2 Non ALS: 0	No			Partial 1/4		Contamination: Previous results
050	0229_MW003_220303		03/03/2022 01:37 PM	Water	ALS: 4 Non ALS: 0	No			Partial 1/4		Extra vol lab qc
051	0229_MW074_220303		03/03/2022 01:51 PM	Water	ALS: 2 Non ALS: 0	No			Partial 1/4		Contamination: Previous results
052	0229_MW123I_220303		03/03/2022 01:52 PM	Water	ALS: 2 Non ALS: 0	No			Partial 1/4		
053	0229_MW123S_220303		03/03/2022 02:11 PM	Water	ALS: 2 Non ALS: 0	No			Partial 1/4		
054	0229_MW065_220303		03/03/2022 02:24 PM	Water	ALS: 2 Non ALS: 0	No			Partial 1/4		

RELINQUISHED BY:
 DATE TIME:

RECEIVED BY:
 DATE TIME:

RELINQUISHED BY:
 DATE TIME:

RECEIVED BY:
 DATE TIME:

CLIENT: AECOMAU - AECOM Australia Pty Ltd
 PROJECT: QLD_0229_PFSOMP_20
 SITE: QLD_0229
 ORDER NO:

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: TV/007/21 - Compass / ET2021AECOMAU0001
 EMAIL REPORTS TO: [REDACTED]
 EMAIL INVOICES TO: [REDACTED]

SAMPLE DETAILS							ANALYSIS REQUIRED				
SAMPLE	NAME	DESCRIPTION	DATE / TIME	MATRIX	TOTAL BOTTLES	ON HOLD	Analysis NOT REQUIRED	Sediments SEDIMENT	Waters WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
055	0229_MW122_220303		03/03/2022 02:38 PM	Water	ALS: 2 Non ALS: 0	No			Partial 1/4		
056	0229_MW138_220303		03/03/2022 02:39 PM	Water	ALS: 2 Non ALS: 0	No			Partial 1/4		Contamination: Previous results
057	0229_QC108_220303		03/03/2022 02:40 PM	Water	ALS: 2 Non ALS: 0	No			Partial 1/4		Contamination: Previous results
058	0229_MW105_220303		03/03/2022 03:05 PM	Water	ALS: 2 Non ALS: 0	No			Partial 1/4		Contamination: Previous results
059	0229_MW002_220303		03/03/2022 02:54 PM	Water	ALS: 2 Non ALS: 0	No			Partial 1/4		
060	0229_MW139_220303		03/03/2022 03:12 PM	Water	ALS: 2 Non ALS: 0	No			Partial 1/4		
061	0229_MW128_220303		03/03/2022 03:17 PM	Water	ALS: 2 Non ALS: 0	No			Partial 1/4		Contamination: Previous results
062	0229_MW121_220303		03/03/2022 03:42 PM	Water	ALS: 2 Non ALS: 0	No			Partial 1/4		
063	0229_MW102_220303		03/03/2022 03:52 PM	Water	ALS: 2 Non ALS: 0	No			Partial 1/4		Contamination: Previous results

RELINQUISHED BY:

RECEIVED BY:

RELINQUISHED BY:

RECEIVED BY:

DATE TIME:

DATE TIME:

DATE TIME:

DATE TIME:

CLIENT: AECOMAU - AECOM Australia Pty Ltd

PROJECT: QLD_0229_PFSOMP_20

SITE: QLD_0229

ORDER NO:

PROJECT MANAGER: [REDACTED]

PRIMARY SAMPLER: [REDACTED]

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:

CONTACT PH: [REDACTED] SAMPLER MOBILE: [REDACTED]
 QUOTE NO: TV/007/21 - Compass / ET2021AECOMAU000
 1

SAMPLE DETAILS							ANALYSIS REQUIRED				
SAMPLE	NAME	DESCRIPTION	DATE / TIME	MATRIX	TOTAL BOTTLES	ON HOLD	Analysis NOT REQUIRED	Sediments SEDIMENT	Waters WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
064	0229_QC109_220303		03/03/2022 03:53 PM	Water	ALS: 2 Non ALS: 0	No			Partial 1/4		Contamination: Previous results
065	0229_MW120_220303		03/03/2022 04:02 PM	Water	ALS: 2 Non ALS: 0	No			Partial 1/4		
066	0229_QC304_220303		03/03/2022 04:04 PM	Water	ALS: 2 Non ALS: 0	No			Partial 1/4		
067	0229_MW101_220303		03/03/2022 04:11 PM	Water	ALS: 6 Non ALS: 0	No			Partial 1/4		Contamination: Previous results Extra vol for lab QC
068	0229_QC305_220303		03/03/2022 04:17 PM	Water	ALS: 2 Non ALS: 0	No			Partial 1/4		
069	0229_SW217_220302		02/03/2022 01:00 PM	Water	ALS: 6 Non ALS: 0	No			Partial 1/4		Contamination: Previous results Extra vol for lab QC
070	0229_SW233_220302		02/03/2022 12:38 PM	Water	ALS: 2 Non ALS: 0	No			Partial 1/4		
071	0229_QC104_220302		02/03/2022 12:00 PM	Water	ALS: 2 Non ALS: 0	No			Partial 1/4		
072	0229_SW242_220302		02/03/2022 01:50 PM	Water	ALS: 2 Non ALS: 0	No			Partial 1/4		

RELINQUISHED BY:
 DATE TIME:

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 DATE TIME:

RELINQUISHED BY:
 DATE TIME:

RECEIVED BY:
 DATE TIME:

CLIENT: AECOMAU - AECOM Australia Pty Ltd
 PROJECT: QLD_0229_PFASOMP_20
 SITE: QLD_0229
 ORDER NO:

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: SAMPLER MOBILE:
 PRIMARY SAMPLER: [REDACTED] QUOTE NO: TV/007/21 - Compass / ET2021AECOMAU000
 1
 EMAIL REPORTS TO: [REDACTED]
 EMAIL INVOICES TO: [REDACTED]

SAMPLE DETAILS							ANALYSIS REQUIRED				
SAMPLE	NAME	DESCRIPTION	DATE / TIME	MATRIX	TOTAL BOTTLES	ON HOLD	Analysis NOT REQUIRED	Sediments SEDIMENT	Waters WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
073	0229_SW136_220302		02/03/2022 09:00 AM	Water	ALS: 2 Non ALS: 0	No			Partial 1/4		
074	0229_SW243_220302		02/03/2022 02:08 PM	Water	ALS: 2 Non ALS: 0	No			Partial 1/4		
075	0229_SW232_220302		02/03/2022 02:34 PM	Water	ALS: 2 Non ALS: 0	No			Partial 1/4		
076	0229_SW205_220302		02/03/2022 11:30 AM	Water	ALS: 6 Non ALS: 0	No			Partial 1/4		
077	0229_QC302_220302		02/03/2022 03:10 PM	Water	ALS: 2 Non ALS: 0	No			Partial 1/4		
078	0229_SW203_220302		02/03/2022 12:00 PM	Water	ALS: 2 Non ALS: 0	No			Partial 1/4		
079	0229_SW220_220302		02/03/2022 01:25 PM	Water	ALS: 2 Non ALS: 0	No			Partial 1/4		
080	0229_SD136_220302		02/03/2022 09:00 AM	Soil	ALS: 1 Non ALS: 0	No		Partial 1/4			
081	0229_SD128_220302		02/03/2022 10:50 AM	Soil	ALS: 1 Non ALS: 0	No		Partial 1/4			

CLIENT: AECOMAU - AECOM Australia Pty Ltd

PROJECT: QLD_0229_PFSOMP_20

SITE: QLD_0229

ORDER NO:

PROJECT MANAGER: [REDACTED]

PRIMARY SAMPLER: [REDACTED]

EMAIL REPORTS TO: [REDACTED]

EMAIL INVOICES TO: [REDACTED]

RELINQUISHED BY:

DATE TIME:

RECEIVED BY:

DATE TIME:

RELINQUISHED BY:

DATE TIME:

RECEIVED BY:

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:

CONTACT PH:

SAMPLER MOBILE:

QUOTE NO: TV/007/21 - Compass

/ ET2021AECOMAU000

1

SAMPLE DETAILS							ANALYSIS REQUIRED				
SAMPLE	NAME	DESCRIPTION	DATE / TIME	MATRIX	TOTAL BOTTLES	ON HOLD	Analysis NOT REQUIRED	Sediments SEDIMENT	Waters WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
082	0229_SD130_220302		02/03/2022 09:30 AM	Soil	ALS: 1 Non ALS: 0	No		Partial 1/4			
083	0229_SD243_220302		02/03/2022 02:10 PM	Soil	ALS: 1 Non ALS: 0	No		Partial 1/4			
084	0229_QC105_220302		02/03/2022 12:00 PM	Soil	ALS: 1 Non ALS: 0	No		Partial 1/4			
085	0229_SD205_220302		02/03/2022 11:30 AM	Soil	ALS: 1 Non ALS: 0	No		Partial 1/4			
086	0229_SD217_220302		02/03/2022 01:00 PM	Soil	ALS: 1 Non ALS: 0	No		Partial 1/4			
087	0229_SD126_220302		02/03/2022 11:00 AM	Soil	ALS: 1 Non ALS: 0	No		Partial 1/4			
088	0229_SD203_220302		02/03/2022 12:00 PM	Soil	ALS: 1 Non ALS: 0	No		Partial 1/4			
089	0229_SD129_220302		02/03/2022 09:50 AM	Soil	ALS: 1 Non ALS: 0	No		Partial 1/4			
090	0229_SD232_220302		02/03/2022 02:30 PM	Soil	ALS: 1 Non ALS: 0	No		Partial 1/4			

CLIENT: AECOMAU - AECOM Australia Pty Ltd

PROJECT: QLD_0229_PFSOMP_20

SITE: QLD_0229

ORDER NO:

PROJECT MANAGER: [REDACTED]

PRIMARY SAMPLER: [REDACTED]

EMAIL REPORTS TO: [REDACTED]

EMAIL INVOICES TO: [REDACTED]

RELINQUISHED BY:

DATE TIME:

RECEIVED BY:

DATE TIME:

RELINQUISHED BY:

DATE TIME:

RECEIVED BY:

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:

CONTACT PH: SAMPLER MOBILE:
 QUOTE NO: TV/007/21 - Compass / ET2021AECOMAU000
 1

SAMPLE DETAILS							ANALYSIS REQUIRED				
SAMPLE	NAME	DESCRIPTION	DATE / TIME	MATRIX	TOTAL BOTTLES	ON HOLD	Analysis NOT REQUIRED	Sediments SEDIMENT	Waters WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
091	0229_SD220_220302		02/03/2022 01:25 PM	Soil	ALS: 1 Non ALS: 0	No		Partial 1/4			
092	0229_SD233_220302		02/03/2022 12:38 PM	Soil	ALS: 1 Non ALS: 0	No		Partial 1/4			
093	0229_QC306_220304		04/03/2022 01:00 PM	Water	ALS: 2 Non ALS: 0	No			Partial 1/4		
094	0229_MW236S_220304		04/03/2022 09:55 AM	Water	ALS: 4 Non ALS: 0	No			Partial 1/4		
095	0229_MW115_220304		04/03/2022 11:05 AM	Water	ALS: 2 Non ALS: 0	No			Partial 1/4		
096	0229_MW116_220304		04/03/2022 10:55 AM	Water	ALS: 2 Non ALS: 0	No			Partial 1/4		
097	0229_MW135_220304		04/03/2022 10:30 AM	Water	ALS: 2 Non ALS: 0	No			Partial 1/4		
098	0229_MW114_220304		04/03/2022 11:32 AM	Water	ALS: 2 Non ALS: 0	No			Partial 1/4		
099	0229_MW018_220304		04/03/2022 12:10 PM	Water	ALS: 4 Non ALS: 0	No			Partial 1/4		

CLIENT: AECOMAU - AECOM Australia Pty Ltd

PROJECT: QLD_0229_PFASOMP_20

SITE: QLD_0229

ORDER NO:

PROJECT MANAGER: [REDACTED]

PRIMARY SAMPLER: [REDACTED]

EMAIL REPORTS TO: [REDACTED]

EMAIL INVOICES TO: [REDACTED]

RELINQUISHED BY:

DATE TIME:

RECEIVED BY:

DATE TIME:

RELINQUISHED BY:

DATE TIME:

RECEIVED BY:

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:

CONTACT PH:

SAMPLER MOBILE:

QUOTE NO: TV/007/21 - Compass

/ ET2021AECOMAU000

1

SAMPLE DETAILS							ANALYSIS REQUIRED				
SAMPLE	NAME	DESCRIPTION	DATE / TIME	MATRIX	TOTAL BOTTLES	ON HOLD	Analysis NOT REQUIRED	Sediments SEDIMENT	Waters WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
100	0229_QC500_220304		04/03/2022 02:13 PM	Water	ALS: 2 Non ALS: 0	No			Partial 1/4		
101	0229_MW141_220303		03/03/2022 02:05 PM	Water	ALS: 2 Non ALS: 0	No			Partial 1/4		

CLIENT: AECOMAU - AECOM Australia Pty Ltd

PROJECT: QLD_0229_PFASOMP_20

SITE: QLD_0229

ORDER NO:

PROJECT MANAGER:

PRIMARY SAMPLER:

EMAIL REPORTS TO:

EMAIL INVOICES TO:

RELINQUISHED BY:

DATE TIME:

RECEIVED BY:

DATE TIME:

RELINQUISHED BY:

DATE TIME:

RECEIVED BY:

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:

CONTACT PH:

SAMPLER MOBILE:

QUOTE NO: TV/007/21 - Compass

/ ET2021AECOMAU000

1

SAMPLE	SAMPLE NAME	PARTIAL ANALYSIS GROUP NAME	MATRIX	SELECTED ANALYSIS NAME
001	0229_SW140_220301	Waters WATER	Water	- EP231X PFAS - Full Suite (28 analytes)
002	0229_SD140_220301	Sediments SEDIMENT	Soil	- EP231X (solids) PFAS - Full Suite (28 analytes)
003	0229_SW109_220301	Waters WATER	Water	- EP231X PFAS - Full Suite (28 analytes)
004	0229_SD109_220301	Sediments SEDIMENT	Soil	- EP231X (solids) PFAS - Full Suite (28 analytes)
005	0229_SD110_220301	Sediments SEDIMENT	Soil	- EP231X (solids) PFAS - Full Suite (28 analytes)
006	0229_SW110_220301	Waters WATER	Water	- EP231X PFAS - Full Suite (28 analytes)
007	0229_SD144_220301	Sediments SEDIMENT	Soil	- EP231X (solids) PFAS - Full Suite (28 analytes)
008	0229_SW144_220301	Waters WATER	Water	- EP231X PFAS - Full Suite (28 analytes)
009	0229_SW139_220301	Waters WATER	Water	- EP231X PFAS - Full Suite (28 analytes)
010	0229_QC102_220301	Waters WATER	Water	- EP231X PFAS - Full Suite (28 analytes)
011	0229_SD139_220301	Sediments SEDIMENT	Soil	- EP231X (solids) PFAS - Full Suite (28 analytes)
012	0229_QC103_220301	Sediments SEDIMENT	Soil	- EP231X (solids) PFAS - Full Suite (28 analytes)
013	0229_SD113_220301	Sediments SEDIMENT	Soil	- EP231X (solids) PFAS - Full Suite (28 analytes)
014	0229_SW113_220301	Waters WATER	Water	- EP231X PFAS - Full Suite (28 analytes)
015	0229_SD119_220301	Sediments SEDIMENT	Soil	- EP231X (solids) PFAS - Full Suite (28 analytes)

CLIENT: AECOMAU - AECOM Australia Pty Ltd

PROJECT: QLD_0229_PFASOMP_20

SITE: QLD_0229

ORDER NO:

PROJECT MANAGER:

PRIMARY SAMPLER:

EMAIL REPORTS TO:

EMAIL INVOICES TO:

RELINQUISHED BY:

DATE TIME:

RECEIVED BY:

DATE TIME:

RELINQUISHED BY:

DATE TIME:

RECEIVED BY:

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:

CONTACT PH:

SAMPLER MOBILE:

QUOTE NO: TV/007/21 - Compass

/ ET2021AECOMAU000
1

016	0229_SW119_220301	Waters WATER	Water	- EP231X PFAS - Full Suite (28 analytes)
017	0229_SD120_220301	Sediments SEDIMENT	Soil	- EP231X (solids) PFAS - Full Suite (28 analytes)
018	0229_SW135_220301	Waters WATER	Water	- EP231X PFAS - Full Suite (28 analytes)
019	0229_SD135_220301	Sediments SEDIMENT	Soil	- EP231X (solids) PFAS - Full Suite (28 analytes)
020	0229_SW121_220301	Waters WATER	Water	- EP231X PFAS - Full Suite (28 analytes)
021	0229_SD133_220301	Sediments SEDIMENT	Soil	- EP231X (solids) PFAS - Full Suite (28 analytes)
022	0229_SD134_220301	Sediments SEDIMENT	Soil	- EP231X (solids) PFAS - Full Suite (28 analytes)
023	0229_SW132_220301	Waters WATER	Water	- EP231X PFAS - Full Suite (28 analytes)
024	0229_QC301_220301	Waters WATER	Water	- EP231X PFAS - Full Suite (28 analytes)
025	0229_MW125S_220302	Waters WATER	Water	- EP231X PFAS - Full Suite (28 analytes)
026	0229_MW125I_220302	Waters WATER	Water	- EP231X PFAS - Full Suite (28 analytes)
027	0229_MW124_220302	Waters WATER	Water	- EP231X PFAS - Full Suite (28 analytes)
028	0229_SD244_220228	Sediments SEDIMENT	Soil	- EP231X (solids) PFAS - Full Suite (28 analytes)
029	0229_SW244_220228	Waters WATER	Water	- EP231X PFAS - Full Suite (28 analytes)
030	0229_SD245_220228	Sediments SEDIMENT	Soil	- EP231X (solids) PFAS - Full Suite (28 analytes)
031	0229_SW245_220228	Waters WATER	Water	- EP231X PFAS - Full Suite (28 analytes)

RELINQUISHED BY:
 DATE TIME:

RECEIVED BY:
 DATE TIME:

RELINQUISHED BY:
 DATE TIME:

RECEIVED BY:
 DATE TIME:

CLIENT: AECOMAU - AECOM Australia Pty Ltd
 PROJECT: QLD_0229_PFASOMP_20
 SITE: QLD_0229
 ORDER NO:

PROJECT MANAGER: [REDACTED]
 PRIMARY SAMPLER: [REDACTED]

EMAIL REPORTS TO: [REDACTED]

EMAIL INVOICES TO: [REDACTED]

TURNAROUND REQUIREMENTS : 5 Days
 Biohazard info:

CONTACT PH: SAMPLER MOBILE:
 QUOTE NO: TV/007/21 - Compass / ET2021AECOMAU000
 1

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:

032	0229_QC100_220228	Waters WATER	Water	- EP231X PFAS - Full Suite (28 analytes)
033	0229_QC101_220228	Sediments SEDIMENT	Soil	- EP231X (solids) PFAS - Full Suite (28 analytes)
034	0229_QC300_220228	Waters WATER	Water	- EP231X PFAS - Full Suite (28 analytes)
035	0229_SW227_220228	Waters WATER	Water	- EP231X PFAS - Full Suite (28 analytes)
036	0229_SD227_220228	Sediments SEDIMENT	Soil	- EP231X (solids) PFAS - Full Suite (28 analytes)
037	0229_MW233_220303	Waters WATER	Water	- EP231X PFAS - Full Suite (28 analytes)
038	0229_MW212_220303	Waters WATER	Water	- EP231X PFAS - Full Suite (28 analytes)
039	0229_MW217_220303	Waters WATER	Water	- EP231X PFAS - Full Suite (28 analytes)
040	0229_QC106_220303	Waters WATER	Water	- EP231X PFAS - Full Suite (28 analytes)
041	0229_MW235S_220303	Waters WATER	Water	- EP231X PFAS - Full Suite (28 analytes)
042	0229_MW205S_220303	Waters WATER	Water	- EP231X PFAS - Full Suite (28 analytes)
043	0229_MW220S_220303	Waters WATER	Water	- EP231X PFAS - Full Suite (28 analytes)
044	0229_QC107_220303	Waters WATER	Water	- EP231X PFAS - Full Suite (28 analytes)
046	0229_MW106_220303	Waters WATER	Water	- EP231X PFAS - Full Suite (28 analytes)
047	0229_MW232_220303	Waters WATER	Water	- EP231X PFAS - Full Suite (28 analytes)
048	0229_MW131_220303	Waters WATER	Water	- EP231X PFAS - Full Suite (28 analytes)

CHAIN OF CUSTODY
ALS COC#: 34488 ALS Laboratory: ET Townsville

RELINQUISHED BY:
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CLIENT: AECOMAU - AECOM Australia Pty Ltd
 PROJECT: QLD_0229_PFASOMP_20
 SITE: QLD_0229
 ORDER NO:

PROJECT MANAGER: [REDACTED]
 PRIMARY SAMPLER: [REDACTED]
 EMAIL REPORTS TO: [REDACTED]
 EMAIL INVOICES TO: [REDACTED]

TURNAROUND REQUIREMENTS : 5 Days
 Biohazard info:

CONTACT PH: SAMPLER MOBILE:
 QUOTE NO: TV/007/21 - Compass / ET2021AECOMAU000
 1

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:

049	0229_MW072_220303	Waters WATER	Water	- EP231X PFAS - Full Suite (28 analytes)
050	0229_MW003_220303	Waters WATER	Water	- EP231X PFAS - Full Suite (28 analytes)
051	0229_MW074_220303	Waters WATER	Water	- EP231X PFAS - Full Suite (28 analytes)
052	0229_MW123I_220303	Waters WATER	Water	- EP231X PFAS - Full Suite (28 analytes)
053	0229_MW123S_220303	Waters WATER	Water	- EP231X PFAS - Full Suite (28 analytes)
054	0229_MW065_220303	Waters WATER	Water	- EP231X PFAS - Full Suite (28 analytes)
055	0229_MW122_220303	Waters WATER	Water	- EP231X PFAS - Full Suite (28 analytes)
056	0229_MW138_220303	Waters WATER	Water	- EP231X PFAS - Full Suite (28 analytes)
057	0229_QC108_220303	Waters WATER	Water	- EP231X PFAS - Full Suite (28 analytes)
058	0229_MW105_220303	Waters WATER	Water	- EP231X PFAS - Full Suite (28 analytes)
059	0229_MW002_220303	Waters WATER	Water	- EP231X PFAS - Full Suite (28 analytes)
060	0229_MW139_220303	Waters WATER	Water	- EP231X PFAS - Full Suite (28 analytes)
061	0229_MW128_220303	Waters WATER	Water	- EP231X PFAS - Full Suite (28 analytes)
062	0229_MW121_220303	Waters WATER	Water	- EP231X PFAS - Full Suite (28 analytes)
063	0229_MW102_220303	Waters WATER	Water	- EP231X PFAS - Full Suite (28 analytes)
064	0229_QC109_220303	Waters WATER	Water	- EP231X PFAS - Full Suite (28 analytes)

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PROJECT MANAGER: [REDACTED] CONTACT PH: SAMPLER MOBILE:
 PRIMARY SAMPLER: [REDACTED] QUOTE NO: TV/007/21 - Compass / ET2021AECOMAU000
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Random Sample Temperature on Receipt: °C
 Other comments:

EMAIL REPORTS TO: [REDACTED]

EMAIL INVOICES TO: [REDACTED]

065	0229_MW120_220303	Waters WATER	Water	- EP231X PFAS - Full Suite (28 analytes)
066	0229_QC304_220303	Waters WATER	Water	- EP231X PFAS - Full Suite (28 analytes)
067	0229_MW101_220303	Waters WATER	Water	- EP231X PFAS - Full Suite (28 analytes)
068	0229_QC305_220303	Waters WATER	Water	- EP231X PFAS - Full Suite (28 analytes)
069	0229_SW217_220302	Waters WATER	Water	- EP231X PFAS - Full Suite (28 analytes)
070	0229_SW233_220302	Waters WATER	Water	- EP231X PFAS - Full Suite (28 analytes)
071	0229_QC104_220302	Waters WATER	Water	- EP231X PFAS - Full Suite (28 analytes)
072	0229_SW242_220302	Waters WATER	Water	- EP231X PFAS - Full Suite (28 analytes)
073	0229_SW136_220302	Waters WATER	Water	- EP231X PFAS - Full Suite (28 analytes)
074	0229_SW243_220302	Waters WATER	Water	- EP231X PFAS - Full Suite (28 analytes)
075	0229_SW232_220302	Waters WATER	Water	- EP231X PFAS - Full Suite (28 analytes)
076	0229_SW205_220302	Waters WATER	Water	- EP231X PFAS - Full Suite (28 analytes)
077	0229_QC302_220302	Waters WATER	Water	- EP231X PFAS - Full Suite (28 analytes)
078	0229_SW203_220302	Waters WATER	Water	- EP231X PFAS - Full Suite (28 analytes)
079	0229_SW220_220302	Waters WATER	Water	- EP231X PFAS - Full Suite (28 analytes)
080	0229_SD136_220302	Sediments SEDIMENT	Soil	- EP231X (solids) PFAS - Full Suite (28 analytes)

CLIENT: AECOMAU - AECOM Australia Pty Ltd
 PROJECT: QLD_0229_PFASOMP_20
 SITE: QLD_0229
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EMAIL REPORTS TO: [REDACTED]

EMAIL INVOICES TO: [REDACTED]

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 1

081	0229_SD128_220302	Sediments SEDIMENT	Soil	- EP231X (solids) PFAS - Full Suite (28 analytes)
082	0229_SD130_220302	Sediments SEDIMENT	Soil	- EP231X (solids) PFAS - Full Suite (28 analytes)
083	0229_SD243_220302	Sediments SEDIMENT	Soil	- EP231X (solids) PFAS - Full Suite (28 analytes)
084	0229_QC105_220302	Sediments SEDIMENT	Soil	- EP231X (solids) PFAS - Full Suite (28 analytes)
085	0229_SD205_220302	Sediments SEDIMENT	Soil	- EP231X (solids) PFAS - Full Suite (28 analytes)
086	0229_SD217_220302	Sediments SEDIMENT	Soil	- EP231X (solids) PFAS - Full Suite (28 analytes)
087	0229_SD126_220302	Sediments SEDIMENT	Soil	- EP231X (solids) PFAS - Full Suite (28 analytes)
088	0229_SD203_220302	Sediments SEDIMENT	Soil	- EP231X (solids) PFAS - Full Suite (28 analytes)
089	0229_SD129_220302	Sediments SEDIMENT	Soil	- EP231X (solids) PFAS - Full Suite (28 analytes)
090	0229_SD232_220302	Sediments SEDIMENT	Soil	- EP231X (solids) PFAS - Full Suite (28 analytes)
091	0229_SD220_220302	Sediments SEDIMENT	Soil	- EP231X (solids) PFAS - Full Suite (28 analytes)
092	0229_SD233_220302	Sediments SEDIMENT	Soil	- EP231X (solids) PFAS - Full Suite (28 analytes)
093	0229_QC306_220304	Waters WATER	Water	- EP231X PFAS - Full Suite (28 analytes)
094	0229_MW236S_220304	Waters WATER	Water	- EP231X PFAS - Full Suite (28 analytes)
095	0229_MW115_220304	Waters WATER	Water	- EP231X PFAS - Full Suite (28 analytes)
096	0229_MW116_220304	Waters WATER	Water	- EP231X PFAS - Full Suite (28 analytes)

CLIENT: AECOMAU - AECOM Australia Pty Ltd

PROJECT: QLD_0229_PFASOMP_20

SITE: QLD_0229

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PROJECT MANAGER: [REDACTED]

PRIMARY SAMPLER: [REDACTED]

EMAIL REPORTS TO: [REDACTED]

EMAIL INVOICES TO: [REDACTED]

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TURNAROUND REQUIREMENTS : 5 Days
Biohazard info:

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 Custody Seal intact? Yes No N/A
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 Random Sample Temperature on Receipt: °C
 Other comments:

CONTACT PH: SAMPLER MOBILE:
 QUOTE NO: TV/007/21 - Compass / ET2021AECOMAU000
 1

097	0229_MW135_220304	Waters WATER	Water	- EP231X PFAS - Full Suite (28 analytes)
098	0229_MW114_220304	Waters WATER	Water	- EP231X PFAS - Full Suite (28 analytes)
099	0229_MW018_220304	Waters WATER	Water	- EP231X PFAS - Full Suite (28 analytes)
100	0229_QC500_220304	Waters WATER	Water	- EP231X PFAS - Full Suite (28 analytes)
101	0229_MW141_220303	Waters WATER	Water	- EP231X PFAS - Full Suite (28 analytes)

CLIENT: AECOMAU - AECOM Australia Pty Ltd

PROJECT: QLD_0229_PFSOMP_20

SITE: QLD_0229

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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:

CONTACT PH:

SAMPLER MOBILE:

QUOTE NO: TV/007/21 - Compass

/ ET2021AECOMAU000

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SAMPLE	SAMPLE NAME	BOTTLE NAME	VOLUME	BARCODE	TYPE	FILTERED	REASON
001	0229_SW140_220301	HDPE (no PTFE)	20 mL	00350019024861	Grey	No	
001	0229_SW140_220301	HDPE (no PTFE)	20 mL	00350019045170	Grey	No	
002	0229_SD140_220301	HDPE Soil Jar	200 mL	00620719053505	Grey	No	
003	0229_SW109_220301	HDPE (no PTFE)	20 mL	00350019024850	Grey	No	
003	0229_SW109_220301	HDPE (no PTFE)	20 mL	00350019045165	Grey	No	
004	0229_SD109_220301	HDPE Soil Jar	200 mL	00620719044469	Grey	No	
005	0229_SD110_220301	HDPE Soil Jar	200 mL	00620719044513	Grey	No	
006	0229_SW110_220301	HDPE (no PTFE)	20 mL	00350019045160	Grey	No	
006	0229_SW110_220301	HDPE (no PTFE)	20 mL	00350019045211	Grey	No	
007	0229_SD144_220301	HDPE Soil Jar	200 mL	00620719071911	Grey	No	
008	0229_SW144_220301	HDPE (no PTFE)	20 mL	00350019045250	Grey	No	
008	0229_SW144_220301	HDPE (no PTFE)	20 mL	00350019024953	Grey	No	
009	0229_SW139_220301	HDPE (no PTFE)	20 mL	00350019045292	Grey	No	
009	0229_SW139_220301	HDPE (no PTFE)	20 mL	00350019045260	Grey	No	
010	0229_QC102_220301	HDPE (no PTFE)	20 mL	00350019024879	Grey	No	
010	0229_QC102_220301	HDPE (no PTFE)	20 mL	00350019045249	Grey	No	
011	0229_SD139_220301	HDPE Soil Jar	200 mL	00621019058844	Grey	No	
012	0229_QC103_220301	HDPE Soil Jar	200 mL	00620719071931	Grey	No	
013	0229_SD113_220301	HDPE Soil Jar	200 mL	00620719044586	Grey	No	
014	0229_SW113_220301	HDPE (no PTFE)	20 mL	00350019024872	Grey	No	
014	0229_SW113_220301	HDPE (no PTFE)	20 mL	00350019045158	Grey	No	
015	0229_SD119_220301	HDPE Soil Jar	200 mL	00620719044500	Grey	No	
016	0229_SW119_220301	HDPE (no PTFE)	20 mL	00350019045186	Grey	No	
016	0229_SW119_220301	HDPE (no PTFE)	20 mL	00350019045238	Grey	No	
017	0229_SD120_220301	HDPE Soil Jar	200 mL	00620719044459	Grey	No	
018	0229_SW135_220301	HDPE (no PTFE)	20 mL	00350019045304	Grey	No	

CLIENT: AECOMAU - AECOM Australia Pty Ltd

PROJECT: QLD_0229_PFSOMP_20

SITE: QLD_0229

ORDER NO:

PROJECT MANAGER: [REDACTED]

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EMAIL REPORTS TO: [REDACTED]

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SAMPLER MOBILE:

QUOTE NO: TV/007/21 - Compass

/ ET2021AECOMAU000
1

018	0229_SW135_220301	HDPE (no PTFE)	20 mL	00350019024938	Grey	No	
019	0229_SD135_220301	HDPE Soil Jar	200 mL	00620719044602	Grey	No	
020	0229_SW121_220301	HDPE (no PTFE)	20 mL	00350019024864	Grey	No	
020	0229_SW121_220301	HDPE (no PTFE)	20 mL	00350019045248	Grey	No	
020	0229_SW121_220301	HDPE (no PTFE)	20 mL	00350019024899	Grey	No	
020	0229_SW121_220301	HDPE (no PTFE)	20 mL	00350019045294	Grey	No	
020	0229_SW121_220301	HDPE (no PTFE)	20 mL	00350019024848	Grey	No	
020	0229_SW121_220301	HDPE (no PTFE)	20 mL	00350019024951	Grey	No	
021	0229_SD133_220301	HDPE Soil Jar	200 mL	00620719053539	Grey	No	
022	0229_SD134_220301	HDPE Soil Jar	200 mL	00620719071859	Grey	No	
023	0229_SW132_220301	HDPE (no PTFE)	20 mL	00350019024964	Grey	No	
023	0229_SW132_220301	HDPE (no PTFE)	20 mL	00350019024914	Grey	No	
024	0229_QC301_220301	HDPE (no PTFE)	20 mL	00350621050402	Grey	No	
024	0229_QC301_220301	HDPE (no PTFE)	20 mL	00350621030192	Grey	No	
025	0229_MW125S_220302	HDPE (no PTFE)	20 mL	00352101033501	Grey	No	
025	0229_MW125S_220302	HDPE (no PTFE)	20 mL	00352101052848	Grey	No	
026	0229_MW125I_220302	HDPE (no PTFE)	20 mL	00350621030146	Grey	No	
026	0229_MW125I_220302	HDPE (no PTFE)	20 mL	00350621030203	Grey	No	
027	0229_MW124_220302	HDPE (no PTFE)	20 mL	00352101033493	Grey	No	
027	0229_MW124_220302	HDPE (no PTFE)	20 mL	00352101052871	Grey	No	
027	0229_MW124_220302	HDPE (no PTFE)	20 mL	00352101033427	Grey	No	
027	0229_MW124_220302	HDPE (no PTFE)	20 mL	00352101052884	Grey	No	
027	0229_MW124_220302	HDPE (no PTFE)	20 mL	00352101033573	Grey	No	
027	0229_MW124_220302	HDPE (no PTFE)	20 mL	00352101033462	Grey	No	
028	0229_SD244_220228	HDPE Soil Jar	200 mL	00620719071585	Grey	No	
029	0229_SW244_220228	HDPE (no PTFE)	20 mL	00352010065621	Grey	No	
029	0229_SW244_220228	HDPE (no PTFE)	20 mL	00352010065601	Grey	No	

CLIENT: AECOMAU - AECOM Australia Pty Ltd

PROJECT: QLD_0229_PFSOMP_20

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030	0229_SD245_220228	HDPE Soil Jar	200 mL	00620719071650	Grey	No	
031	0229_SW245_220228	HDPE (no PTFE)	20 mL	00352010056778	Grey	No	
031	0229_SW245_220228	HDPE (no PTFE)	20 mL	00352010056715	Grey	No	
032	0229_QC100_220228	HDPE (no PTFE)	20 mL	00352010065650	Grey	No	
032	0229_QC100_220228	HDPE (no PTFE)	20 mL	00352010065587	Grey	No	
033	0229_QC101_220228	HDPE Soil Jar	200 mL	00620719071602	Grey	No	
034	0229_QC300_220228	HDPE (no PTFE)	20 mL	00352010065491	Grey	No	
034	0229_QC300_220228	HDPE (no PTFE)	20 mL	00352010065603	Grey	No	
035	0229_SW227_220228	HDPE (no PTFE)	20 mL	00352010065482	Grey	No	
035	0229_SW227_220228	HDPE (no PTFE)	20 mL	00352010065600	Grey	No	
035	0229_SW227_220228	HDPE (no PTFE)	20 mL	00352010065528	Grey	No	
035	0229_SW227_220228	HDPE (no PTFE)	20 mL	00352010065590	Grey	No	
035	0229_SW227_220228	HDPE (no PTFE)	20 mL	00352010065605	Grey	No	
035	0229_SW227_220228	HDPE (no PTFE)	20 mL	00352010065584	Grey	No	
036	0229_SD227_220228	HDPE Soil Jar	200 mL	00620719071584	Grey	No	
037	0229_MW233_220303	HDPE (no PTFE)	20 mL	00350019024847	Grey	No	
037	0229_MW233_220303	HDPE (no PTFE)	20 mL	00350019024894	Grey	No	
037	0229_MW233_220303	HDPE (no PTFE)	20 mL	00350019045223	Grey	No	
037	0229_MW233_220303	HDPE (no PTFE)	20 mL	00350019045153	Grey	No	
038	0229_MW212_220303	HDPE (no PTFE)	20 mL	00350019024955	Grey	No	
038	0229_MW212_220303	HDPE (no PTFE)	20 mL	00350019024888	Grey	No	
039	0229_MW217_220303	HDPE (no PTFE)	20 mL	00350019045205	Grey	No	
039	0229_MW217_220303	HDPE (no PTFE)	20 mL	00350019045246	Grey	No	
040	0229_QC106_220303	HDPE (no PTFE)	20 mL	00350019045207	Grey	No	
040	0229_QC106_220303	HDPE (no PTFE)	20 mL	00350019045172	Grey	No	
041	0229_MW235S_220303	HDPE (no PTFE)	20 mL	00350019024933	Grey	No	
041	0229_MW235S_220303	HDPE (no PTFE)	20 mL	00350019045219	Grey	No	

CLIENT: AECOMAU - AECOM Australia Pty Ltd

PROJECT: QLD_0229_PFSOMP_20

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041	0229_MW235S_220303	HDPE (no PTFE)	20 mL	00350019045154	Grey	No	
041	0229_MW235S_220303	HDPE (no PTFE)	20 mL	00350019045218	Grey	No	
042	0229_MW205S_220303	HDPE (no PTFE)	20 mL	00350019024882	Grey	No	
042	0229_MW205S_220303	HDPE (no PTFE)	20 mL	00350019024890	Grey	No	
043	0229_MW220S_220303	HDPE (no PTFE)	20 mL	00350019024958	Grey	No	
043	0229_MW220S_220303	HDPE (no PTFE)	20 mL	00350019045199	Grey	No	
044	0229_QC107_220303	HDPE (no PTFE)	20 mL	00350019045270	Grey	No	
044	0229_QC107_220303	HDPE (no PTFE)	20 mL	00350019024974	Grey	No	
045	0229_QC303_220303	HDPE (no PTFE)	20 mL	00350019045235	Grey	No	
045	0229_QC303_220303	HDPE (no PTFE)	20 mL	00350019045215	Grey	No	
046	0229_MW106_220303	HDPE (no PTFE)	20 mL	00352101033416	Grey	No	
046	0229_MW106_220303	HDPE (no PTFE)	20 mL	00352101033570	Grey	No	
047	0229_MW232_220303	HDPE (no PTFE)	20 mL	00350019045254	Grey	No	
047	0229_MW232_220303	HDPE (no PTFE)	20 mL	00350019045287	Grey	No	
048	0229_MW131_220303	HDPE (no PTFE)	20 mL	00350019024869	Grey	No	
048	0229_MW131_220303	HDPE (no PTFE)	20 mL	00350019024901	Grey	No	
048	0229_MW131_220303	HDPE (no PTFE)	20 mL	00352101052802	Grey	No	
048	0229_MW131_220303	HDPE (no PTFE)	20 mL	00350019024956	Grey	No	
048	0229_MW131_220303	HDPE (no PTFE)	20 mL	00352101033516	Grey	No	
048	0229_MW131_220303	HDPE (no PTFE)	20 mL	00350019024948	Grey	No	
049	0229_MW072_220303	HDPE (no PTFE)	20 mL	00350019045309	Grey	No	
049	0229_MW072_220303	HDPE (no PTFE)	20 mL	00350019045201	Grey	No	
050	0229_MW003_220303	HDPE (no PTFE)	20 mL	00350019024932	Grey	No	
050	0229_MW003_220303	HDPE (no PTFE)	20 mL	00350019045233	Grey	No	
050	0229_MW003_220303	HDPE (no PTFE)	20 mL	00350019045197	Grey	No	
050	0229_MW003_220303	HDPE (no PTFE)	20 mL	00350019045297	Grey	No	
051	0229_MW074_220303	HDPE (no PTFE)	20 mL	00350019045180	Grey	No	

**CHAIN OF CUSTODY**

COC#: 34488

ALS Laboratory: ET Townsville

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RECEIVED BY:

DATE TIME:

DATE TIME:

DATE TIME:

DATE TIME:

CLIENT: AECOMAU - AECOM Australia Pty Ltd

PROJECT: QLD_0229_PFASOMP_20

SITE: QLD_0229

ORDER NO:

PROJECT MANAGER: [REDACTED]

PRIMARY SAMPLER: [REDACTED]

EMAIL REPORTS TO: [REDACTED]

EMAIL INVOICES TO: [REDACTED]

CONTACT PH:

SAMPLER MOBILE:

QUOTE NO: TV/007/21 - Compass

/ ET2021AECOMAU000

1

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact?

Yes No N/A

Free ice / frozen ice bricks present upon receipt?

Yes No N/A

Random Sample Temperature on Receipt:

°C

Other comments:

051	0229_MW074_220303	HDPE (no PTFE)	20 mL	00350019024975	Grey	No	
052	0229_MW123I_220303	HDPE (no PTFE)	20 mL	00350019045255	Grey	No	
052	0229_MW123I_220303	HDPE (no PTFE)	20 mL	00350019024965	Grey	No	
053	0229_MW123S_220303	HDPE (no PTFE)	20 mL	00350019045178	Grey	No	
053	0229_MW123S_220303	HDPE (no PTFE)	20 mL	00350019045244	Grey	No	
054	0229_MW065_220303	HDPE (no PTFE)	20 mL	00350019045265	Grey	No	
054	0229_MW065_220303	HDPE (no PTFE)	20 mL	00350019024877	Grey	No	
055	0229_MW122_220303	HDPE (no PTFE)	20 mL	00350019045302	Grey	No	
055	0229_MW122_220303	HDPE (no PTFE)	20 mL	00350019024867	Grey	No	
056	0229_MW138_220303	HDPE (no PTFE)	20 mL	00350019045271	Grey	No	
056	0229_MW138_220303	HDPE (no PTFE)	20 mL	00350019024927	Grey	No	
057	0229_QC108_220303	HDPE (no PTFE)	20 mL	00350621050475	Grey	No	
057	0229_QC108_220303	HDPE (no PTFE)	20 mL	00350621030106	Grey	No	
058	0229_MW105_220303	HDPE (no PTFE)	20 mL	00350019024866	Grey	No	
058	0229_MW105_220303	HDPE (no PTFE)	20 mL	00350019045229	Grey	No	
059	0229_MW002_220303	HDPE (no PTFE)	20 mL	00350019024972	Grey	No	
059	0229_MW002_220303	HDPE (no PTFE)	20 mL	00350019045300	Grey	No	
060	0229_MW139_220303	HDPE (no PTFE)	20 mL	00350019024959	Grey	No	
060	0229_MW139_220303	HDPE (no PTFE)	20 mL	00350019045307	Grey	No	
061	0229_MW128_220303	HDPE (no PTFE)	20 mL	00350019024957	Grey	No	
061	0229_MW128_220303	HDPE (no PTFE)	20 mL	00350019045177	Grey	No	
062	0229_MW121_220303	HDPE (no PTFE)	20 mL	00350019024941	Grey	No	
062	0229_MW121_220303	HDPE (no PTFE)	20 mL	00350019024924	Grey	No	
063	0229_MW102_220303	HDPE (no PTFE)	20 mL	00350019024852	Grey	No	
063	0229_MW102_220303	HDPE (no PTFE)	20 mL	00350019045231	Grey	No	
064	0229_QC109_220303	HDPE (no PTFE)	20 mL	00350019045289	Grey	No	
064	0229_QC109_220303	HDPE (no PTFE)	20 mL	00350019045303	Grey	No	



CHAIN OF CUSTODY

COC#: 34488 ALS Laboratory: ET Townsville

RELINQUISHED BY:

RECEIVED BY:

RELINQUISHED BY:

RECEIVED BY:

DATE TIME:

DATE TIME:

DATE TIME:

DATE TIME:

CLIENT: AECOMAU - AECOM Australia Pty Ltd

PROJECT: QLD_0229_PFSOMP_20

SITE: QLD_0229

ORDER NO:

PROJECT MANAGER:

PRIMARY SAMPLER:

EMAIL REPORTS TO:

EMAIL INVOICES TO:

CONTACT PH:

QUOTE NO: TV/007/21 - Compass

SAMPLER MOBILE:

/ ET2021AECOMAU000

1

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

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

Random Sample Temperature on Receipt: C

Other comments:

065	0229_MW120_220303	HDPE (no PTFE)	20 mL	00350019045189	Grey	No	
065	0229_MW120_220303	HDPE (no PTFE)	20 mL	00350019045243	Grey	No	
066	0229_QC304_220303	HDPE (no PTFE)	20 mL	00350019024902	Grey	No	
066	0229_QC304_220303	HDPE (no PTFE)	20 mL	00350019045183	Grey	No	
067	0229_MW101_220303	HDPE (no PTFE)	20 mL	00350019045181	Grey	No	
067	0229_MW101_220303	HDPE (no PTFE)	20 mL	00350019045208	Grey	No	
067	0229_MW101_220303	HDPE (no PTFE)	20 mL	00350019024854	Grey	No	
067	0229_MW101_220303	HDPE (no PTFE)	20 mL	00350019045295	Grey	No	
067	0229_MW101_220303	HDPE (no PTFE)	20 mL	00350019024908	Grey	No	
067	0229_MW101_220303	HDPE (no PTFE)	20 mL	00350019045284	Grey	No	
068	0229_QC305_220303	HDPE (no PTFE)	20 mL	00350019024898	Grey	No	
068	0229_QC305_220303	HDPE (no PTFE)	20 mL	00350019045253	Grey	No	
069	0229_SW217_220302	HDPE (no PTFE)	20 mL	00352101033423	Grey	No	
069	0229_SW217_220302	HDPE (no PTFE)	20 mL	00352101033496	Grey	No	
069	0229_SW217_220302	HDPE (no PTFE)	20 mL	00350621050497	Grey	No	
069	0229_SW217_220302	HDPE (no PTFE)	20 mL	00352101033584	Grey	No	
069	0229_SW217_220302	HDPE (no PTFE)	20 mL	00350621030175	Grey	No	
069	0229_SW217_220302	HDPE (no PTFE)	20 mL	00352101033457	Grey	No	
070	0229_SW233_220302	HDPE (no PTFE)	20 mL	00352101033461	Grey	No	
070	0229_SW233_220302	HDPE (no PTFE)	20 mL	00352101033445	Grey	No	
071	0229_QC104_220302	HDPE (no PTFE)	20 mL	00350621050432	Grey	No	
071	0229_QC104_220302	HDPE (no PTFE)	20 mL	00350621050445	Grey	No	
072	0229_SW242_220302	HDPE (no PTFE)	20 mL	00352101052877	Grey	No	
072	0229_SW242_220302	HDPE (no PTFE)	20 mL	00352101052813	Grey	No	
073	0229_SW136_220302	HDPE (no PTFE)	20 mL	00350621030121	Grey	No	
073	0229_SW136_220302	HDPE (no PTFE)	20 mL	00350621050455	Grey	No	
074	0229_SW243_220302	HDPE (no PTFE)	20 mL	00352101052807	Grey	No	



CHAIN OF CUSTODY

COC#: 34488 ALS Laboratory: ET Townsville

RELINQUISHED BY:

DATE TIME:

RECEIVED BY:

DATE TIME:

RELINQUISHED BY:

DATE TIME:

RECEIVED BY:

DATE TIME:

CLIENT: AECOMAU - AECOM Australia Pty Ltd

PROJECT: QLD_0229_PASOMP_20

SITE: QLD_0229

ORDER NO:

PROJECT MANAGER:

PRIMARY SAMPLER:

EMAIL REPORTS 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:

CONTACT PH: SAMPLER MOBILE:
QUOTE NO: TV/007/21 - Compass / ET2021AECOMAU000
1

EMAIL INVOICES TO:

074	0229_SW243_220302	HDPE (no PTFE)	20 mL	00352101033439	Grey	No
075	0229_SW232_220302	HDPE (no PTFE)	20 mL	00352101033420	Grey	No
075	0229_SW232_220302	HDPE (no PTFE)	20 mL	00352101033554	Grey	No
076	0229_SW205_220302	HDPE (no PTFE)	20 mL	00350621050409	Grey	No
076	0229_SW205_220302	HDPE (no PTFE)	20 mL	00350621050493	Grey	No
076	0229_SW205_220302	HDPE (no PTFE)	20 mL	00350621030173	Grey	No
076	0229_SW205_220302	HDPE (no PTFE)	20 mL	00350621030185	Grey	No
076	0229_SW205_220302	HDPE (no PTFE)	20 mL	00352101033411	Grey	No
076	0229_SW205_220302	HDPE (no PTFE)	20 mL	00352101033470	Grey	No
077	0229_QC302_220302	HDPE (no PTFE)	20 mL	00350621030123	Grey	No
077	0229_QC302_220302	HDPE (no PTFE)	20 mL	00350621050476	Grey	No
078	0229_SW203_220302	HDPE (no PTFE)	20 mL	00350621050413	Grey	No
078	0229_SW203_220302	HDPE (no PTFE)	20 mL	00350621030181	Grey	No
079	0229_SW220_220302	HDPE (no PTFE)	20 mL	00352101052868	Grey	No
079	0229_SW220_220302	HDPE (no PTFE)	20 mL	00352101033463	Grey	No
080	0229_SD136_220302	HDPE Soil Jar	200 mL	00620719044537	Grey	No
081	0229_SD128_220302	HDPE Soil Jar	200 mL	00620719044489	Grey	No
082	0229_SD130_220302	HDPE Soil Jar	200 mL	00621019058875	Grey	No
083	0229_SD243_220302	HDPE Soil Jar	200 mL	00620719026168	Grey	No
084	0229_QC105_220302	HDPE Soil Jar	200 mL	00620719071943	Grey	No
085	0229_SD205_220302	HDPE Soil Jar	200 mL	00620719026155	Grey	No
086	0229_SD217_220302	HDPE Soil Jar	200 mL	00620719044509	Grey	No
087	0229_SD126_220302	HDPE Soil Jar	200 mL	00620719044482	Grey	No
088	0229_SD203_220302	HDPE Soil Jar	200 mL	00620719026159	Grey	No
089	0229_SD129_220302	HDPE Soil Jar	200 mL	00620719044488	Grey	No
090	0229_SD232_220302	HDPE Soil Jar	200 mL	00620719026246	Grey	No
091	0229_SD220_220302	HDPE Soil Jar	200 mL	00620719026199	Grey	No

RELINQUISHED BY:

RECEIVED BY:

RELINQUISHED BY:

RECEIVED BY:

DATE TIME:

DATE TIME:

DATE TIME:

DATE TIME:

CLIENT: AECOMAU - AECOM Australia Pty Ltd

PROJECT: QLD_0229_PFSOMP_20

SITE: QLD_0229

ORDER NO:

PROJECT MANAGER: [REDACTED]

PRIMARY SAMPLER: [REDACTED]

EMAIL REPORTS TO: [REDACTED]

EMAIL INVOICES TO: [REDACTED]

CONTACT PH: SAMPLER MOBILE:
 QUOTE NO: TV/007/21 - Compass / ET2021AECOMAU000
 1

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

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

092	0229_SD233_220302	HDPE Soil Jar	200 mL	00620719026282	Grey	No	
093	0229_QC306_220304	HDPE (no PTFE)	20 mL	00350019045267	Grey	No	
093	0229_QC306_220304	HDPE (no PTFE)	20 mL	00350019045282	Grey	No	
094	0229_MW236S_220304	HDPE (no PTFE)	20 mL	00350019045157	Grey	No	
094	0229_MW236S_220304	HDPE (no PTFE)	20 mL	00350019024931	Grey	No	
094	0229_MW236S_220304	HDPE (no PTFE)	20 mL	00350019045164	Grey	No	
094	0229_MW236S_220304	HDPE (no PTFE)	20 mL	00350019024937	Grey	No	
095	0229_MW115_220304	HDPE (no PTFE)	20 mL	00350019045274	Grey	No	
095	0229_MW115_220304	HDPE (no PTFE)	20 mL	00350019024973	Grey	No	
096	0229_MW116_220304	HDPE (no PTFE)	20 mL	00350019024935	Grey	No	
096	0229_MW116_220304	HDPE (no PTFE)	20 mL	00350019024971	Grey	No	
097	0229_MW135_220304	HDPE (no PTFE)	20 mL	00350019024946	Grey	No	
097	0229_MW135_220304	HDPE (no PTFE)	20 mL	00350019045305	Grey	No	
098	0229_MW114_220304	HDPE (no PTFE)	20 mL	00350019045310	Grey	No	
098	0229_MW114_220304	HDPE (no PTFE)	20 mL	00350019045296	Grey	No	
099	0229_MW018_220304	HDPE (no PTFE)	20 mL	00350019045152	Grey	No	
099	0229_MW018_220304	HDPE (no PTFE)	20 mL	00350019024845	Grey	No	
099	0229_MW018_220304	HDPE (no PTFE)	20 mL	00350019045280	Grey	No	
099	0229_MW018_220304	HDPE (no PTFE)	20 mL	00350019024880	Grey	No	
100	0229_QC500_220304	HDPE (no PTFE)	20 mL	00350019043508	Grey	No	
100	0229_QC500_220304	HDPE (no PTFE)	20 mL	00350019043516	Grey	No	
101	0229_MW141_220303	HDPE (no PTFE)	20 mL	00350019024940	Grey	No	
101	0229_MW141_220303	HDPE (no PTFE)	20 mL	00350019024895	Grey	No	

Total Bottle Count: ALS: 211, Non ALS: 0



Environmental Division
Townsville
Work Order Reference
ET2202340



Telephone : - 61 7 4773 0000

Custody Document for Submissions via ALS Compass App

Project: QLD-0229_PFA5OMP_20 Client: AECOM

Project Manager: [Redacted]

ALS Compass COC Reference: 36676 # Samples: 16

Phone: ([Redacted])

Sampler: [Redacted]

Phone: ([Redacted])

Turnaround Requirements: Standard Urgent

Special Instructions:

Custody:

Relinquished by:

Received by:

Relinquished by:

Received by:

Date / Time:

Date / Time:

Date / Time:

Date / Time:

26/4/2022 10:25

26/4/22 10:30

27/4/2022 @ 8.50

CHAIN OF CUSTODY COC#: 36676 ALS Laboratory: ET Townsville	RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
	DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME:
CLIENT: AECOMAU - AECOM Australia Pty Ltd	TURNAROUND REQUIREMENTS : 5 Days		LABORATORY USE ONLY (Circle)	
PROJECT: QLD_0229_PFASOMP_20				
SITE: QLD_0229	Biohazard info:		Custody Seal Intact?	Yes No N/A
ORDER NO:			Free ice / frozen ice bricks present upon receipt?	Yes No N/A
PROJECT MANAGER: [REDACTED]	CONTACT PH:	SAMPLER MOBILE:	Random Sample Temperature on Receipt:	°C
PRIMARY SAMPLER: [REDACTED]	QUOTE NO: TV/007/21 - Compass	/ ET2021AECOMAU000 1	Other comments:	
EMAIL REPORTS TO: [REDACTED]				
EMAIL INVOICES TO: [REDACTED]				

SAMPLE DETAILS							ANALYSIS REQUIRED				
SAMPLE	NAME	DESCRIPTION	DATE / TIME	MATRIX	TOTAL BOTTLES	ON HOLD	Analysis NOT REQUIRED	Sediments SEDIMENT	Waters WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
001	0229_MW217_220422		22/04/2022 01:34 PM	Water	ALS: 2 Non ALS: 0	No			Partial 1/4		
002	0229_SW120_220422		22/04/2022 02:09 PM	Water	ALS: 2 Non ALS: 0	No			Partial 1/4		
003	0229_SW133_220422		22/04/2022 02:26 PM	Water	ALS: 4 Non ALS: 0	No			Partial 1/4		Extra vol lab qc
004	0229_SW134_220422		22/04/2022 02:36 PM	Water	ALS: 2 Non ALS: 0	No			Partial 1/4		
005	0229_SW130_220422		22/04/2022 02:49 PM	Water	ALS: 2 Non ALS: 0	No			Partial 1/4		
006	0229_SW129_220422		22/04/2022 03:07 PM	Water	ALS: 2 Non ALS: 0	No			Partial 1/4		
007	0229_QC150_220422		22/04/2022 03:07 PM	Water	ALS: 2 Non ALS: 0	No			Partial 1/4		
008	0229_SW128_220422		22/04/2022 03:18 PM	Water	ALS: 4 Non ALS: 0	No			Partial 1/4		Extra vol lab qc
009	0229_SW126_220422		22/04/2022 03:32 PM	Water	ALS: 2 Non ALS: 0	No			Partial 1/4		

RELINQUISHED BY:
 DATE TIME:

RECEIVED BY:
 DATE TIME:

RELINQUISHED BY:
 DATE TIME:

RECEIVED BY:
 DATE TIME:

CLIENT: AECOMAU - AECOM Australia Pty Ltd
 PROJECT: QLD_0229_PFASOMP_20
 SITE: QLD_0229
 ORDER NO:
 PROJECT MANAGER: ██████████
 PRIMARY SAMPLER: ██████████
 EMAIL REPORTS TO: ██████████
 EMAIL INVOICES TO: ██████████

TURNAROUND REQUIREMENTS : 5 Days
 Biohazard info:

CONTACT PH: ██████████ SAMPLER MOBILE: ██████████
 QUOTE NO: TV/007/21 - Compass / ET2021AECOMAU000
 1

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	Analysis NOT REQUIRED	Sediments SEDIMENT	Waters WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
010	0229_QC350_220422		22/04/2022 03:38 PM	Water	ALS: 2 Non ALS: 0	No			Partial 1/4		
011	0229_SD121_220422		22/04/2022 03:57 PM	Soil	ALS: 1 Non ALS: 0	No		Partial 1/4			
012	0229_SD132_220422		22/04/2022 04:06 PM	Soil	ALS: 1 Non ALS: 0	No		Partial 1/4			
013	0229_SD242_220422		22/04/2022 04:25 PM	Soil	ALS: 1 Non ALS: 0	No		Partial 1/4			
014	0229_QC550_220422		22/04/2022 08:00 AM	Water	ALS: 2 Non ALS: 0	No			Partial 1/4		
015	0229_SW110_220426		26/04/2022 10:01 AM	Water	ALS: 4 Non ALS: 0	No	-				Extra volume lab qc
016	0229_QC351_220426		26/04/2022 10:02 AM	Water	ALS: 2 Non ALS: 0	No	-				

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

CLIENT: AECOMAU - AECOM Australia Pty Ltd
 PROJECT: QLD_0229_PFASOMP_20
 SITE: QLD_0229
 ORDER NO:
 PROJECT MANAGER: [REDACTED]
 PRIMARY SAMPLER: [REDACTED]
 EMAIL REPORTS TO: [REDACTED]
 EMAIL INVOICES TO: [REDACTED]

TURNAROUND REQUIREMENTS : 5 Days
 Biohazard info:
 CONTACT PH: [REDACTED] SAMPLER MOBILE: [REDACTED]
 QUOTE NO: TV/007/21 - Compass / ET2021AECOMAU000
 1

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

SAMPLE	SAMPLE NAME	PARTIAL ANALYSIS GROUP NAME	MATRIX	SELECTED ANALYSIS NAME
001	0229_MW217_220422	Waters WATER	Water	- EP231X PFAS - Full Suite (28 analytes)
002	0229_SW120_220422	Waters WATER	Water	- EP231X PFAS - Full Suite (28 analytes)
003	0229_SW133_220422	Waters WATER	Water	- EP231X PFAS - Full Suite (28 analytes)
004	0229_SW134_220422	Waters WATER	Water	- EP231X PFAS - Full Suite (28 analytes)
005	0229_SW130_220422	Waters WATER	Water	- EP231X PFAS - Full Suite (28 analytes)
006	0229_SW129_220422	Waters WATER	Water	- EP231X PFAS - Full Suite (28 analytes)
007	0229_QC150_220422	Waters WATER	Water	- EP231X PFAS - Full Suite (28 analytes)
008	0229_SW128_220422	Waters WATER	Water	- EP231X PFAS - Full Suite (28 analytes)
009	0229_SW126_220422	Waters WATER	Water	- EP231X PFAS - Full Suite (28 analytes)
010	0229_QC350_220422	Waters WATER	Water	- EP231X PFAS - Full Suite (28 analytes)
011	0229_SD121_220422	Sediments SEDIMENT	Soil	- EP231X (solids) PFAS - Full Suite (28 analytes)
012	0229_SD132_220422	Sediments SEDIMENT	Soil	- EP231X (solids) PFAS - Full Suite (28 analytes)
013	0229_SD242_220422	Sediments SEDIMENT	Soil	- EP231X (solids) PFAS - Full Suite (28 analytes)
014	0229_QC550_220422	Waters WATER	Water	- EP231X PFAS - Full Suite (28 analytes)

RELINQUISHED BY:
 DATE TIME:

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 DATE TIME:

CLIENT: AECOMAU - AECOM Australia Pty Ltd
 PROJECT: QLD_0229_PFSOMP_20
 SITE: QLD_0229
 ORDER NO:
 PROJECT MANAGER:
 PRIMARY SAMPLER:
 EMAIL REPORTS TO:
 EMAIL INVOICES TO:

TURNAROUND REQUIREMENTS : 5 Days
 Biohazard info:

CONTACT PH: SAMPLER MOBILE:
 QUOTE NO: TV/007/21 - Compass / ET2021AECOMAU000
 1

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	0229_MW217_220422	HDPE (no PTFE)	20 mL	00350821027844	Grey	No	
001	0229_MW217_220422	HDPE (no PTFE)	20 mL	00350821027797	Grey	No	
002	0229_SW120_220422	HDPE (no PTFE)	20 mL	00350821027719	Grey	No	
002	0229_SW120_220422	HDPE (no PTFE)	20 mL	00350821027874	Grey	No	
003	0229_SW133_220422	HDPE (no PTFE)	20 mL	00350821027620	Grey	No	
003	0229_SW133_220422	HDPE (no PTFE)	20 mL	00350821027541	Grey	No	
003	0229_SW133_220422	HDPE (no PTFE)	20 mL	00350821027382	Grey	No	
003	0229_SW133_220422	HDPE (no PTFE)	20 mL	00350821027713	Grey	No	
004	0229_SW134_220422	HDPE (no PTFE)	20 mL	00350821027742	Grey	No	
004	0229_SW134_220422	HDPE (no PTFE)	20 mL	00350821027736	Grey	No	
005	0229_SW130_220422	HDPE (no PTFE)	20 mL	00350821027715	Grey	No	
005	0229_SW130_220422	HDPE (no PTFE)	20 mL	00350821027417	Grey	No	
006	0229_SW129_220422	HDPE (no PTFE)	20 mL	00350821027768	Grey	No	
006	0229_SW129_220422	HDPE (no PTFE)	20 mL	00350821027802	Grey	No	
007	0229_QC150_220422	HDPE (no PTFE)	20 mL	00350821027536	Grey	No	
007	0229_QC150_220422	HDPE (no PTFE)	20 mL	00350821027906	Grey	No	
008	0229_SW128_220422	HDPE (no PTFE)	20 mL	00350821027329	Grey	No	
008	0229_SW128_220422	HDPE (no PTFE)	20 mL	00350821027392	Grey	No	
008	0229_SW128_220422	HDPE (no PTFE)	20 mL	00350821027725	Grey	No	
008	0229_SW128_220422	HDPE (no PTFE)	20 mL	00350821027473	Grey	No	
009	0229_SW126_220422	HDPE (no PTFE)	20 mL	00350821027857	Grey	No	
009	0229_SW126_220422	HDPE (no PTFE)	20 mL	00350821027567	Grey	No	
010	0229_QC350_220422	HDPE (no PTFE)	20 mL	00350821027399	Grey	No	
010	0229_QC350_220422	HDPE (no PTFE)	20 mL	00350821027358	Grey	No	
011	0229_SD121_220422	HDPE Soil Jar	200 mL	00620719026205	Grey	No	
012	0229_SD132_220422	HDPE Soil Jar	200 mL	00620719071906	Grey	No	

CHAIN OF CUSTODY
ALS COC#: 36676 ALS Laboratory: ET Townsville

RELINQUISHED BY:
 DATE TIME:

RECEIVED BY:
 DATE TIME:

RELINQUISHED BY:
 DATE TIME:

RECEIVED BY:
 DATE TIME:

CLIENT: AECOMAU - AECOM Australia Pty Ltd
 PROJECT: QLD_0229_PFASOMP_20
 SITE: QLD_0229

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:

ORDER NO:
 PROJECT MANAGER:
 PRIMARY SAMPLER:
 EMAIL REPORTS TO:
 EMAIL INVOICES TO:

CONTACT PH:
 QUOTE NO: TV/007/21 - Compass

SAMPLER MOBILE:
 / ET2021AECOMAU000
 1

013	0229_SD242_220422	HDPE Soil Jar	200 mL	00620719071561	Grey	No	
014	0229_QC550_220422	HDPE (no PTFE)	20 mL	00352010056564	Grey	No	
014	0229_QC550_220422	HDPE (no PTFE)	20 mL	00352010056496	Grey	No	
015	0229_SW110_220426	HDPE (no PTFE)	20 mL	00350019152629	Grey	No	
015	0229_SW110_220426	HDPE (no PTFE)	20 mL	00350019152628	Grey	No	
015	0229_SW110_220426	HDPE (no PTFE)	20 mL	00350019152581	Grey	No	
015	0229_SW110_220426	HDPE (no PTFE)	20 mL	00352010057921	Grey	No	
016	0229_QC351_220426	HDPE (no PTFE)	20 mL	00352010065542	Grey	No	
016	0229_QC351_220426	HDPE (no PTFE)	20 mL	00352010065441	Grey	No	

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



Custody Document for Submissions via ALS Compass App

Project: QLD_0229_PFA50MP_20 Client: AECOM Project Manager: [Redacted]
 ALS Compass COC Reference: 34609 # Samples: 4 Phone: ()
 Turnaround Requirements: Standard Urgent Sampler: [Redacted]
 Phone: ()

Special Instructions:

Custody:			
Relinquished by: [Redacted]	Received by: [Redacted]	Relinquished by:	Received by: [Redacted]
Date / Time: 4/3/22 1445	Date / Time: 4/3 3:15pm	Date / Time:	Date / Time: 08.03.22 09:10

RELINQUISHED BY:
 DATE TIME:

RECEIVED BY:
 DATE TIME:

RELINQUISHED BY:
 DATE TIME:

RECEIVED BY:
 DATE TIME:

CLIENT: AECOMAU - AECOM Australia Pty Ltd
 PROJECT: QLD_0229_PFASOMP_20
 SITE: QLD_0229
 ORDER NO:

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]
 EMAIL REPORTS TO: [REDACTED]
 EMAIL INVOICES TO: [REDACTED]

CONTACT PH: [REDACTED] SAMPLER MOBILE: [REDACTED]
 QUOTE NO: TV/007/21 - Compass / ET2021AECOMAU0001

SAMPLE DETAILS							ANALYSIS REQUIRED			
SAMPLE	NAME	DESCRIPTION	DATE / TIME	MATRIX	TOTAL BOTTLES	ON HOLD	Sediments SEDIMENT	Waters WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
001	0229_SW211_220303		03/03/2022 08:09 AM	Water	ALS: 4 Non ALS: 0	No		Partial 1/4		Extra vol lab qc
002	0229_SD211_220303		03/03/2022 08:10 AM	Soil	ALS: 1 Non ALS: 0	No	Partial 1/4			
003	0229_SW212_220303		03/03/2022 07:32 AM	Water	ALS: 4 Non ALS: 0	No		Partial 1/4		Extra vol lab qc
004	0229_SD212_220303		03/03/2022 07:40 AM	Soil	ALS: 1 Non ALS: 0	No	Partial 1/4			

**CHAIN OF CUSTODY**

COC#: 34609 ALS Laboratory: ET Townsville

RELINQUISHED BY:

RECEIVED BY:

RELINQUISHED BY:

RECEIVED BY:

DATE TIME:

DATE TIME:

DATE TIME:

DATE TIME:

CLIENT: AECOMAU - AECOM Australia Pty Ltd

PROJECT: QLD_0229_PFASOMP_20

SITE: QLD_0229

ORDER NO:

PROJECT MANAGER: [REDACTED]

PRIMARY SAMPLER: [REDACTED]

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:

CONTACT PH:

SAMPLER MOBILE:

QUOTE NO: TV/007/21 - Compass

/ ET2021AECOMAU000

1

SAMPLE	SAMPLE NAME	PARTIAL ANALYSIS GROUP NAME	MATRIX	SELECTED ANALYSIS NAME
001	0229_SW211_220303	Waters WATER	Water	- EP231X PFAS - Full Suite (28 analytes)
002	0229_SD211_220303	Sediments SEDIMENT	Soil	- EP231X (solids) PFAS - Full Suite (28 analytes)
003	0229_SW212_220303	Waters WATER	Water	- EP231X PFAS - Full Suite (28 analytes)
004	0229_SD212_220303	Sediments SEDIMENT	Soil	- EP231X (solids) PFAS - Full Suite (28 analytes)

**CHAIN OF CUSTODY**

COC#: 34609

ALS Laboratory: ET Townsville

RELINQUISHED BY:

RECEIVED BY:

RELINQUISHED BY:

RECEIVED BY:

DATE TIME:

DATE TIME:

DATE TIME:

DATE TIME:

CLIENT: AECOMAU - AECOM Australia Pty Ltd

PROJECT: QLD_0229_PFASOMP_20

SITE: QLD_0229

ORDER NO:

PROJECT MANAGER:

CONTACT PH:

SAMPLER MOBILE:

PRIMARY SAMPLER:

QUOTE NO: TV/007/21 - Compass

/ ET2021AECOMAU000

1

EMAIL REPORTS TO:

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	0229_SW211_220303	HDPE (no PTFE)	20 mL	00350019024863	Grey	No	
001	0229_SW211_220303	HDPE (no PTFE)	20 mL	00350019045298	Grey	No	
001	0229_SW211_220303	HDPE (no PTFE)	20 mL	00350019024900	Grey	No	
001	0229_SW211_220303	HDPE (no PTFE)	20 mL	00350019045226	Grey	No	
002	0229_SD211_220303	HDPE Soil Jar	200 mL	00620719071586	Grey	No	
003	0229_SW212_220303	HDPE (no PTFE)	20 mL	00350019045286	Grey	No	
003	0229_SW212_220303	HDPE (no PTFE)	20 mL	00352101033553	Grey	No	
003	0229_SW212_220303	HDPE (no PTFE)	20 mL	00350019045301	Grey	No	
003	0229_SW212_220303	HDPE (no PTFE)	20 mL	00352101033440	Grey	No	
004	0229_SD212_220303	HDPE Soil Jar	200 mL	00620719070659	Grey	No	

Total Bottle Count: ALS: 10, Non ALS: 0



Environmental Division
Townsville
Work Order Reference
ET2201357



Telephone +61 7 4773 0000

Custody Document for Submissions via ALS Compass App

Project: OLD_0279_PEA_SAMP_20 Client: AELOM Project Manager: [REDACTED]
ALS Compass COC Reference: 34553 # Samples: 1 Phone: ([REDACTED])
Turnaround Requirements: Standard Urgent Sampler: [REDACTED]
Phone: ([REDACTED])

Special Instructions:

Custody:

Relinquished by: [REDACTED]	Received by: [REDACTED]	Relinquished by: [REDACTED]	Received by: [REDACTED]
Date / Time: 4/3/22 1445	Date / Time: 4/3 3:15pm	Date / Time: [REDACTED]	Date / Time: 08-03-22 09:10



CHAIN OF CUSTODY

COC#: 34553 ALS Laboratory: ET Townsville

RELINQUISHED BY:

RECEIVED BY:

RELINQUISHED BY:

RECEIVED BY:

DATE TIME:

DATE TIME:

DATE TIME:

DATE TIME:

CLIENT: AECOMAU - AECOM Australia Pty Ltd

PROJECT: QLD_0229_PFASOMP_20

SITE: QLD_0229

ORDER NO:

PROJECT MANAGER: [REDACTED]

PRIMARY SAMPLER: [REDACTED]

EMAIL REPORTS TO: [REDACTED]

EMAIL INVOICES TO: [REDACTED]

CONTACT PH:

QUOTE NO: TV/007/21 - Compass

SAMPLER MOBILE:

/ ET2021AECOMAU000
1

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

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

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE DETAILS

ANALYSIS REQUIRED

SAMPLE	NAME	DESCRIPTION	DATE / TIME	MATRIX	TOTAL BOTTLES	ON HOLD	ANALYSIS REQUIRED		
							Waters WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
001	0229_MW226_220302		02/03/2022 07:30 AM	Water	ALS: 2 Non ALS: 0	No	Partial 1/4		



CHAIN OF CUSTODY

COC#: 34553 ALS Laboratory: ET Townsville

RELINQUISHED BY:

RECEIVED BY:

RELINQUISHED BY:

RECEIVED BY:

DATE TIME:

DATE TIME:

DATE TIME:

DATE TIME:

CLIENT: AECOMAU - AECOM Australia Pty Ltd

PROJECT: QLD_0229_PFASOMP_20

SITE: QLD_0229

ORDER NO:

PROJECT MANAGER: [REDACTED]

PRIMARY SAMPLER: [REDACTED]

EMAIL REPORTS TO: [REDACTED]

EMAIL INVOICES TO: [REDACTED]

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

CONTACT PH:

SAMPLER MOBILE:

QUOTE NO: TV/007/21 - Compass

/ ET2021AECOMAU000

1

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

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

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE	SAMPLE NAME	PARTIAL ANALYSIS GROUP NAME	MATRIX	SELECTED ANALYSIS NAME
001	0229_MW226_220302	Waters WATER	Water	- EP231X PFAS - Full Suite (28 analytes)



CHAIN OF CUSTODY

COC#: 34553 ALS Laboratory: ET Townsville

RELINQUISHED BY:

RECEIVED BY:

RELINQUISHED BY:

RECEIVED BY:

DATE TIME:

DATE TIME:

DATE TIME:

DATE TIME:

CLIENT: AECOMAU - AECOM Australia Pty Ltd

PROJECT: QLD_0229_PFASOMP_20

SITE: QLD_0229

ORDER NO:

PROJECT MANAGER: [REDACTED]

PRIMARY SAMPLER: [REDACTED]

EMAIL REPORTS TO: [REDACTED]

EMAIL INVOICES TO: [REDACTED]

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

CONTACT PH: SAMPLER MOBILE:
QUOTE NO: TV/007/21 - Compass / ET2021AECOMAU000
1

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	0229_MW226_220302	HDPE (no PTFE)	20 mL	00350621050444	Grey	No	
001	0229_MW226_220302	HDPE (no PTFE)	20 mL	00350621030127	Grey	No	

Total Bottle Count: ALS: 2, Non ALS: 0



Environmental Division
 Townsville
 Work Order Reference
ET2201060



Telephone - 61 7 4773 0000

Custody Document for Submissions via ALS Compass App

Project: _____ Client: AECOM Project Manager: _____
 Phone: (_____)
 ALS Compass COC Reference: 34027 # Samples: _____ Sampler: _____
 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: 	Received by: <u>A</u> 	Relinquished by:	Received by:
Date / Time: <u>18/2/22 16:45</u>	Date / Time: <u>18/2/22 1645</u>	Date / Time:	Date / Time: <u>22022022 08:45</u>

CLIENT: AECOMAU - AECOM Australia Pty Ltd
 PROJECT: QLD_0229_PFASOMP_20
 SITE: QLD_0229
 ORDER NO:

PROJECT MANAGER: [REDACTED]
 PRIMARY SAMPLER: [REDACTED]

CONTACT PH: [REDACTED] SAMPLER MOBILE: [REDACTED]
 QUOTE NO: TV/007/21 - Compass / ET2021AECOMAU000
 1

EMAIL REPORTS TO: [REDACTED]

EMAIL INVOICES TO: [REDACTED]

RELINQUISHED BY:
 DATE TIME:

RECEIVED BY:
 DATE TIME:

RELINQUISHED BY:
 DATE TIME:

RECEIVED BY:
 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	Waters WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
001	0229_MW118_220218			Water	ALS: 0 Non ALS: 0	No	Partial 1/4		
002	0229_MW119_220218		18/02/2022 10:20 AM	Water	ALS: 2 Non ALS: 0	No	Partial 1/4		
003	0229_MW117D_220218		14/02/2022 01:00 PM	Water	ALS: 2 Non ALS: 0	No	Partial 1/4		
004	0229_QC300_220218		18/02/2022 12:17 PM	Water	ALS: 2 Non ALS: 0	No	Partial 1/4		
005	0229_QC500_220218		18/02/2022 12:24 PM	Water	ALS: 2 Non ALS: 0	No	Partial 1/4		

**CHAIN OF CUSTODY**

COC#: 34027

ALS Laboratory: ET Townsville

RELINQUISHED BY:

RECEIVED BY:

RELINQUISHED BY:

RECEIVED BY:

DATE TIME:

DATE TIME:

DATE TIME:

DATE TIME:

CLIENT: AECOMAU - AECOM Australia Pty Ltd

PROJECT: QLD_0229_PFASOMP_20

SITE: QLD_0229

ORDER NO:

PROJECT MANAGER:

PRIMARY SAMPLER:

EMAIL REPORTS TO:

EMAIL INVOICES TO:

CONTACT PH:

QUOTE NO: TV/007/21 - Compass

SAMPLER MOBILE:

/ ET2021AECOMAU000
1

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

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

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE	SAMPLE NAME	PARTIAL ANALYSIS GROUP NAME	MATRIX	SELECTED ANALYSIS NAME
001	0229_MW118_220218	Waters WATER	Water	- EP231X PFAS - Full Suite (28 analytes)
002	0229_MW119_220218	Waters WATER	Water	- EP231X PFAS - Full Suite (28 analytes)
003	0229_MW117D_220218	Waters WATER	Water	- EP231X PFAS - Full Suite (28 analytes)
004	0229_QC300_220218	Waters WATER	Water	- EP231X PFAS - Full Suite (28 analytes)
005	0229_QC500_220218	Waters WATER	Water	- EP231X PFAS - Full Suite (28 analytes)

CHAIN OF CUSTODY
 ALS COC#: 34027 ALS Laboratory: ET Townsville

RELINQUISHED BY:
 DATE TIME:

RECEIVED BY:
 DATE TIME:

RELINQUISHED BY:
 DATE TIME:

RECEIVED BY:
 DATE TIME:

CLIENT: AECOMAU - AECOM Australia Pty Ltd
 PROJECT: QLD_0229_PFASOMP_20
 SITE: QLD_0229
 ORDER NO:

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]
 EMAIL REPORTS TO: [REDACTED]


CONTACT PH: [REDACTED] SAMPLER MOBILE: [REDACTED]
 QUOTE NO: TV/007/21 - Compass / ET2021AECOMAU000
 1

EMAIL INVOICES TO: [REDACTED]

SAMPLE	SAMPLE NAME	BOTTLE NAME	VOLUME	BARCODE	TYPE	FILTERED	REASON
002	0229_MW119_220218	HDPE (no PTFE)	20 mL	00352010065688	Grey	No	
002	0229_MW119_220218	HDPE (no PTFE)	20 mL	00352010065639	Grey	No	
003	0229_MW117D_220218	HDPE (no PTFE)	20 mL	00350621050942	Grey	No	
003	0229_MW117D_220218	HDPE (no PTFE)	20 mL	00350621050913	Grey	No	
004	0229_QC300_220218	HDPE (no PTFE)	20 mL	00352010065614	Grey	No	
004	0229_QC300_220218	HDPE (no PTFE)	20 mL	00352010065689	Grey	No	
005	0229_QC500_220218	HDPE (no PTFE)	20 mL	00352101053178	Grey	No	
005	0229_QC500_220218	HDPE (no PTFE)	20 mL	00352101052980	Grey	No	

Total Bottle Count: ALS: 8, Non ALS: 0

AEC006/220428 A0 ✓ 5/5

CHAIN OF CUSTODY DOCUMENTATION										DESTINATION LABORATORY: NMI		
CLIENT: AECOM Australia					SAMPLER: [REDACTED]							
ADDRESS / OFFICE: AECOM Townsville, level 5,7-13 Tomlins St, South Townsville 4810					MOBILE: [REDACTED]							
PROJECT MANAGER (PM): [REDACTED]					PHONE: [REDACTED]							
PROJECT ID: QLD_0229_PFA_SOMP_20					EMAIL REPORT TO: [REDACTED]							
SITE: QLD_0229 P.O. NO.: 00012487_3.1					EMAIL INVOICE TO: (if different to report) [REDACTED]							
RESULTS REQUIRED (Date): Standard TAT QUOTE NO.:					ANALYSIS REQUIRED:					Notes: e.g. Highly contaminated samples e.g. "High PAHs expected". Extra volume for OC or trace LORs etc.		
FOR LABORATORY USE ONLY		COMMENTS / SPECIAL HANDLING / STORAGE OR DISPOSAL:			WATER - PFAS Standard 26 analyses							
COOLER SEAL (circle appropriate)												
Intact: Yes No N/A												
SAMPLE TEMPERATURE												
CHILLED: Yes No					HOLD							
SAMPLE INFORMATION (note: S = Soil, W=Water)				CONTAINER INFORMATION								
LAB ID	SAMPLE ID	MATRIX	DATE	Time	Type / Code	Total bottles						
	0229_QC250_220422	W	22.04.2022		4 x P	4	x					
 N22/007832												
										RECEIVED 28 APR 2022 BY [REDACTED] 9:00 e		
RELINQUISHED BY:					RECEIVED BY:					METHOD OF SHIPMENT:		
Name: [REDACTED]					Name: [REDACTED]					Cont' Note No:		
Of: AECOM					Date: 26/4/22					Time: 1300		
Name:					Name:					Transport Co:		
Of:					Of:					Time:		
Water Container Codes: P = Unpreserved Plastic; N = Nitric Preserved Plastic; ORC = Nitric Preserved ORC; SH = Sodium Hydroxide/Cd Preserved; S = Sodium Hydroxide Preserved Plastic; AG = Amber Glass Unpreserved; V = VOA Vial HCl Preserved; VS = VOA Vial Sulphuric Preserved; SG = Sulfuric Preserved Amber Glass; H = HCl preserved Plastic; HS = HCl preserved Speciation bottle; SP = Sulfuric Preserved Plastic; F = Formaldehyde Preserved Glass; Z = Zinc Acetate Preserved Bottle; E = EDTA Preserved Bottles; ST = Sterile Bottle; ASS = Plastic Bag for Acid Sulphate Soils; B = Unpreserved Bag.												

CHAIN OF CUSTODY DOCUMENTATION

✓ 16/3
NMI

CLIENT: **AECOM Australia**
 ADDRESS / OFFICE: AECOM Townsville, level 5.7-13 Terminus St, South Townsville
 PROJECT MANAGER (PM): [REDACTED]
 PROJECT ID: QLD 0229 PFASOMP 20
 SITE: QLD 0229 P.O. NO.: 60612487_3.1

SAMPLER: [REDACTED]
 MOBILE: [REDACTED]
 PHONE: [REDACTED]
 EMAIL REPORT TO: [REDACTED]
 EMAIL INVOICE TO: (if different to report) [REDACTED]

RESULTS REQUIRED (Date): Standard TAT QUOTE NO:

ANALYSIS REQUIRED including SUITES (note - suite codes must be listed to attract suite prices)

FOR LABORATORY USE ONLY
 COOLER SEAL (circle appropriate)
 Intact: Yes No N/A
 SAMPLE TEMPERATURE
 CHILLED: Yes No

COMMENTS / SPECIAL HANDLING / STORAGE OR DISPOSAL:

Notes: e.g. Highly contaminated samples
 e.g. "High PAHs expected".
 Extra volume for QC or trace LORs etc.
AECO06/220309

SAMPLE INFORMATION (note: S = Soil, W=Water) CONTAINER INFORMATION

ALS ID	SAMPLE ID	MATRIX	DATE	Time	Type / Code	Total bottles	WATER - PFAS Standard 28 analyses	SOIL - PFAS Standard 28 analyses	HOLD
	0229_QC200-220228	W	28/02/22		TXP	1	X		
	0229_QC205								
	0229_QC205								
	0229_QC205-220302		02/03/22	1200	1XP	1		X	
	0229_QC201-220228		28/02/22	1020	1XP	1		X	
	0229_QC203-220301		01/03/22	1245	1XP	1		X	
	0229_QC201-220303		03/03/22	1228	1XP	1	X		
	0229_QC200-220228		28/02/22	1020	1XP	1	X		
	0229_QC204-220302		02/03/22	1200	1XP	1	X		
	0229_QC202-220301		01/03/22	1254	1XP	1	X		
	0229_QC209-220303		03/03/22	353	1XP	1	X		
	0229_QC206-220303		03/03/22	11:14	1XP	1	X		
	0229_QC208-220303		03/03/22	140	1XP	1	X		

N22/004077
 N22/004078
 N22/004079
 N22/004080
 N22/004081
 N22/004082
 N22/004083
 N22/004084
 N22/004085
 N22/004086

RECEIVED
 09 MAR 2022
 BY: [REDACTED]

RELINQUISHED BY:
 Name: [REDACTED]
 Of: AECOM
 Name: [REDACTED]
 Of: [REDACTED]
 Time: 1:42 PM
 Date: 07/03/22

RECEIVED BY:
 Name: [REDACTED]
 Of: [REDACTED]
 Name: [REDACTED]
 Of: [REDACTED]
 Date: [REDACTED]
 Time: [REDACTED]

METHOD OF SHIPMENT
 Con' Note No:
 Transport Co:

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

Appendix E

Laboratory Analytical Reports

CERTIFICATE OF ANALYSIS

Work Order : **ET2201060**
Client : **AECOM AUSTRALIA PTY LTD**
Contact : [REDACTED]
Address : PO BOX 5175
 TOWNSVILLE QLD, AUSTRALIA 4870
Telephone : ----
Project : QLD_0229_PFASOMP_20
Order number : -
C-O-C number : 34027
Sampler : [REDACTED]
Site : QLD_0229
Quote number : TV/007/21 v2 - Compass
No. of samples received : 5
No. of samples analysed : 5

Page : 1 of 5
Laboratory : Environmental Division Townsville
Contact : [REDACTED]
Address : 13 Carlton Street, Kirwan Townsville QLD Australia 4815
Telephone : + [REDACTED]
Date Samples Received : 22-Feb-2022 08:45
Date Analysis Commenced : 24-Feb-2022
Issue Date : 01-Mar-2022 14:36



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

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

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

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

Signatories

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

<i>Signatories</i>	<i>Position</i>	<i>Accreditation Category</i>
[REDACTED]	Assistant Laboratory Manager	Brisbane Organics, Stafford, QLD



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 Contact 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.

- \$\$ conducted by ALS Brisbane, NATA Site No. 818.
- 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.
- All remaining analysis will be conducted by ALS Environmental, Brisbane, NATA accreditation no. 825, Site No. 818.
- EP231X - PFAS: Whole bottle extraction was not possible for sample "0229_MW117D_220218". Sample required dilution prior to extraction due to matrix interference (high sediment content). LOR values have been adjusted accordingly. The LOR of PFBS has been further raised due to additional matrix interference.
- 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.
- 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, PFTTrDA and 10:2 FTS. These compounds use an internal standard that is chemically related and has a retention time close to that of the target compound. The DQO for internal standard response is 50-150% of that established at initial calibration. PFOS is quantified using a certified, traceable standard consisting of linear and branched PFOS isomers. These practices are in line with recommendations in the National Environmental Management Plan for PFAS (Australian HEPA) and also conform to QSM 5.3 (US DoD) requirements.



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	0229_MW118_220218	0229_MW119_220218	0229_MW117D_22021 8	0229_QC300_220218	0229_QC500_220218
Sampling date / time					18-Feb-2022 12:25	18-Feb-2022 10:20	14-Feb-2022 13:00	18-Feb-2022 12:17	18-Feb-2022 12:24
Compound	CAS Number	LOR	Unit	ET2201060-001	ET2201060-002	ET2201060-003	ET2201060-004	ET2201060-005	
				Result	Result	Result	Result	Result	
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	0.04	0.29	<0.12	<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	0.03	0.06	0.11	<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	<0.02	0.13	<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	0.23	<0.02	<0.02	<0.02	
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	0.24	0.03	<0.02	<0.02	
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	0.16	<0.02	<0.02	<0.02	
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	0.11	<0.02	<0.01	<0.01	
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02	
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02	
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02	
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02	
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02	
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	<0.05	<0.06	<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	<0.06	<0.05	<0.05	
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	<0.05	<0.06	<0.05	<0.05	



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	0229_MW118_220218	0229_MW119_220218	0229_MW117D_22021 8	0229_QC300_220218	0229_QC500_220218
Sampling date / time					18-Feb-2022 12:25	18-Feb-2022 10:20	14-Feb-2022 13:00	18-Feb-2022 12:17	18-Feb-2022 12:24
Compound	CAS Number	LOR	Unit	ET2201060-001	ET2201060-002	ET2201060-003	ET2201060-004	ET2201060-005	ET2201060-005
				Result	Result	Result	Result	Result	Result
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	<0.05	<0.06	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	<0.05	<0.06	<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	<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	<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	<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	<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	<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	<0.05
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L	0.07	1.19	0.38	<0.01	<0.01	<0.01
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	0.03	0.06	0.24	<0.01	<0.01	<0.01
Sum of PFAS (WA DER List)	----	0.01	µg/L	0.07	1.19	0.38	<0.01	<0.01	<0.01
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%	94.9	112	103	94.7	102	102
13C8-PFOA	----	0.02	%	97.8	99.1	97.6	103	101	101



Surrogate Control Limits

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

Inter-Laboratory Testing

Analysis conducted by ALS Brisbane, NATA accreditation no. 825, site no. 818 (Chemistry) 18958 (Biology).

(WATER) EP231A: Perfluoroalkyl Sulfonic Acids

(WATER) EP231B: Perfluoroalkyl Carboxylic Acids

(WATER) EP231C: Perfluoroalkyl Sulfonamides

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

(WATER) EP231P: PFAS Sums

(WATER) EP231S: PFAS Surrogate



QUALITY CONTROL REPORT

Work Order : ET2201060
Client : AECOM AUSTRALIA PTY LTD
Contact :
Address : PO BOX 5175 TOWNSVILLE QLD, AUSTRALIA 4870
Telephone :
Project : QLD_0229_PFASOMP_20
Order number : -
C-O-C number : 34027
Sampler :
Site : QLD_0229
Quote number : TV/007/21 v2 - Compass
No. of samples received : 5
No. of samples analysed : 5

Page : 1 of 5
Laboratory : Environmental Division Townsville
Contact :
Address : 13 Carlton Street, Kirwan Townsville QLD Australia 4815
Telephone :
Date Samples Received : 22-Feb-2022
Date Analysis Commenced : 24-Feb-2022
Issue Date : 01-Mar-2022



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.

Table with 3 columns: Signatories, Position, Accreditation Category. Row 1: [Redacted], Assistant Laboratory Manager, Brisbane Organics, Stafford, QLD



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: 4195813)									
ET2201060-001	0229_MW118_220218	EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	0.03	0.04	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	0.04	0.05	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: 4195813)									
ET2201060-001	0229_MW118_220218	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: 4195813)							
ET2201060-001	0229_MW118_220218	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: 4195813) - continued									
ET2201060-001	0229_MW118_220218	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: 4195813)									
ET2201060-001	0229_MW118_220218	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: 4195813)									
ET2201060-001	0229_MW118_220218	EP231X: Sum of PFAS	----	0.01	µg/L	0.07	0.09	25.0	No Limit
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	0.03	0.04	28.6	No Limit
		EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	0.07	0.09	25.0	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: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report				
				Result	Spike Concentration	Spike Recovery (%)		Acceptable Limits (%)	
						LCS	Low	High	
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4195813)									
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.2218 µg/L	116	72.0	130	
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.2352 µg/L	127	71.0	127	
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	0.2373 µg/L	110	68.0	131	
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.238 µg/L	117	69.0	134	
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.232 µg/L	128	65.0	140	
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.241 µg/L	110	53.0	142	
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4195813)									
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	1.25 µg/L	117	73.0	129	
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	0.25 µg/L	117	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	110	72.0	130	
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	0.25 µg/L	116	71.0	133	
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	0.25 µg/L	124	69.0	130	
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	0.25 µg/L	124	71.0	129	
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	0.25 µg/L	125	69.0	133	
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	0.25 µg/L	124	72.0	134	
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	0.25 µg/L	114	65.0	144	
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	0.625 µg/L	93.5	71.0	132	
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4195813)									
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.25 µg/L	123	67.0	137	
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	0.625 µg/L	112	68.0	141	
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	0.625 µg/L	105	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	117	62.6	138	
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	0.25 µg/L	134	65.0	136	
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	0.25 µg/L	120	61.0	135	
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4195813)									
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.2343 µg/L	121	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	128	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	135	67.0	138	



Sub-Matrix: WATER

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report				
				Result	Spike Concentration	Spike Recovery (%)		Acceptable Limits (%)	
					LCS	Low	High		
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4195813) - continued									
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	0.241 µg/L	128	64.2	133	
EP231P: PFAS Sums (QCLot: 4195813)									
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	: ET2201060	Page	: 1 of 5
Client	: AECOM AUSTRALIA PTY LTD	Laboratory	: Environmental Division Townsville
Contact	: [REDACTED]	Telephone	: [REDACTED]
Project	: QLD_0229_PFASOMP_20	Date Samples Received	: 22-Feb-2022
Site	: QLD_0229	Issue Date	: 01-Mar-2022
Sampler	: [REDACTED]	No. of samples received	: 5
Order number	: -	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, **NO** surrogate recovery outliers occur.

Outliers : Analysis Holding Time Compliance

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

Outliers : Frequency of Quality Control Samples

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



Outliers : Frequency of Quality Control Samples

Matrix: **WATER**

Quality Control Sample Type Method	Count		Rate (%)		Quality Control Specification
	QC	Regular	Actual	Expected	
Laboratory Duplicates (DUP)					
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	1	13	7.69	10.00	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)					
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	0	13	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) 0229_MW117D_220218	14-Feb-2022	25-Feb-2022	13-Aug-2022	✔	25-Feb-2022	13-Aug-2022	✔	
HDPE (no PTFE) (EP231X) 0229_MW118_220218, 0229_QC300_220218,	0229_MW119_220218, 0229_QC500_220218	18-Feb-2022	25-Feb-2022	17-Aug-2022	✔	25-Feb-2022	17-Aug-2022	✔
EP231B: Perfluoroalkyl Carboxylic Acids								
HDPE (no PTFE) (EP231X) 0229_MW117D_220218	14-Feb-2022	25-Feb-2022	13-Aug-2022	✔	25-Feb-2022	13-Aug-2022	✔	
HDPE (no PTFE) (EP231X) 0229_MW118_220218, 0229_QC300_220218,	0229_MW119_220218, 0229_QC500_220218	18-Feb-2022	25-Feb-2022	17-Aug-2022	✔	25-Feb-2022	17-Aug-2022	✔
EP231C: Perfluoroalkyl Sulfonamides								
HDPE (no PTFE) (EP231X) 0229_MW117D_220218	14-Feb-2022	25-Feb-2022	13-Aug-2022	✔	25-Feb-2022	13-Aug-2022	✔	
HDPE (no PTFE) (EP231X) 0229_MW118_220218, 0229_QC300_220218,	0229_MW119_220218, 0229_QC500_220218	18-Feb-2022	25-Feb-2022	17-Aug-2022	✔	25-Feb-2022	17-Aug-2022	✔
EP231D: (n:2) Fluorotelomer Sulfonic Acids								
HDPE (no PTFE) (EP231X) 0229_MW117D_220218	14-Feb-2022	25-Feb-2022	13-Aug-2022	✔	25-Feb-2022	13-Aug-2022	✔	
HDPE (no PTFE) (EP231X) 0229_MW118_220218, 0229_QC300_220218,	0229_MW119_220218, 0229_QC500_220218	18-Feb-2022	25-Feb-2022	17-Aug-2022	✔	25-Feb-2022	17-Aug-2022	✔



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) 0229_MW117D_220218	14-Feb-2022	25-Feb-2022	13-Aug-2022	✓	25-Feb-2022	13-Aug-2022	✓	
HDPE (no PTFE) (EP231X) 0229_MW118_220218, 0229_QC300_220218,	0229_MW119_220218, 0229_QC500_220218	18-Feb-2022	25-Feb-2022	17-Aug-2022	✓	25-Feb-2022	17-Aug-2022	✓



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	Method	Count		Rate (%)			Quality Control Specification
		QC	Regular	Actual	Expected	Evaluation	
Analytical Methods							
Laboratory Duplicates (DUP)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	13	7.69	10.00	✘	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	13	7.69	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	13	7.69	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	0	13	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.

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



SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : ET2201060

Client	: AECOM AUSTRALIA PTY LTD	Laboratory	: Environmental Division Townsville
Contact	: [REDACTED]	Contact	: [REDACTED]
Address	: PO BOX 5175 TOWNSVILLE QLD, AUSTRALIA 4870	Address	: 13 Carlton Street, Kirwan Townsville QLD Australia 4815
E-mail	: [REDACTED]	E-mail	: [REDACTED]
Telephone	: ----	Telephone	: [REDACTED]
Facsimile	: ----	Facsimile	: [REDACTED]
Project	: QLD_0229_PFASOMP_20	Page	: 1 of 3
Order number	: -	Quote number	: ET2021AECOMAU0001 (TV/007/21 v2 - Compass)
C-O-C number	: 34027	QC Level	: NEPM 2013 B3 & ALS QC Standard
Site	: QLD_0229		
Sampler	: [REDACTED]		

Dates

Date Samples Received	: 22-Feb-2022 08:45	Issue Date	: 22-Feb-2022
Client Requested Due Date	: 02-Mar-2022	Scheduled Reporting Date	: 02-Mar-2022

Delivery Details

Mode of Delivery	: Carrier	Security Seal	: Intact.
No. of coolers/boxes	: 1	Temperature	: 7.9°C - Ice present
Receipt Detail	: MEDIUM	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
- \$\$ conducted by ALS Brisbane, NATA Site No. 818.
- ***Samples were originally received by ALS Townsville on 18/02/21 (18.6°C), and forwarded to ALS Brisbane for analysis.**
- **For your reference: sample '0229_MW118_220218' was received with an empty container due to an unscrewed lid. This container has not been logged in the work order. Please take this into consideration when reviewing your results.**
- Discounted Package Prices apply only when specific ALS Group Codes ('W', 'S', 'NT' suites) are referenced on COCs.
- Please direct any turn around / technical queries to the laboratory contact designated above.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months ± 1 week) from receipt of samples.
- All remaining analysis will be conducted by ALS Environmental, Brisbane, NATA accreditation no. 825, Site No. 818.
- 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.
- **Please refer to the Proactive Holding Time Report table below which summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory. The laboratory will process these samples unless instructions are received from you indicating you do not wish to proceed. The absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.**



Sample 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)
ET2201060-001	18-Feb-2022 12:25	0229_MW118_220218	✓
ET2201060-002	18-Feb-2022 10:20	0229_MW119_220218	✓
ET2201060-003	14-Feb-2022 13:00	0229_MW117D_220218	✓
ET2201060-004	18-Feb-2022 12:17	0229_QC300_220218	✓
ET2201060-005	18-Feb-2022 12:24	0229_QC500_220218	✓

Proactive Holding Time Report

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



Requested Deliverables

ACCOUNTS PAYABLE

- A4 - AU Tax Invoice (INV)

Email AP_CustomerService.ANZ@aecom.com

- *AU Certificate of Analysis - NATA (COA)
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)
- A4 - AU Tax Invoice (INV)
- Chain of Custody (CoC) (COC)
- EDI Format - ENMRG (ENMRG)
- EDI Format - ESDAT (ESDAT)

Email
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Email
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Email

- EDI Format - ESDAT (ESDAT)

Email

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

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- *AU Certificate of Analysis - NATA (COA)
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)
- A4 - AU Tax Invoice (INV)
- Chain of Custody (CoC) (COC)
- EDI Format - EQUIS V5 AECOM (EQUIS_V5_AECOM)
- EDI Format - ESDAT (ESDAT)

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

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CERTIFICATE OF ANALYSIS

Work Order : **ET2201357**
Client : **AECOM AUSTRALIA PTY LTD**
Contact : [REDACTED]
Address : PO BOX 5175
 TOWNSVILLE QLD, AUSTRALIA 4870
Telephone : ----
Project : QLD_0229_PFSOMP_20
Order number : 60612487_3.1
C-O-C number : 34553
Sampler : [REDACTED]
Site : QLD_0229
Quote number : TV/007/21 v2 - Compass
No. of samples received : 1
No. of samples analysed : 1

Page : 1 of 5
Laboratory : Environmental Division Townsville
Contact : [REDACTED]
Address : 13 Carlton Street, Kirwan Townsville QLD Australia 4815
Telephone : [REDACTED]
Date Samples Received : 08-Mar-2022 09:10
Date Analysis Commenced : 08-Mar-2022
Issue Date : 15-Mar-2022 09:51



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.

<i>Signatories</i>	<i>Position</i>	<i>Accreditation Category</i>
[REDACTED]	2IC Organic Chemist	Brisbane Organics, Stafford, QLD



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 Contact 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.
- \$\$ conducted by ALS Townsville, NATA accreditation no. 825, (Site no. 23472 for Chemical Testing and Site no. 23313 for Biological Testing)
- All remaining analysis will be conducted by ALS Environmental, Brisbane, NATA accreditation no. 825, Site No. 818.
- 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.
- EP231: Stable isotope enriched internal standards are added to samples prior to extraction. Target compounds have a direct analogous internal standard with the exception of PFPeS, PFHpA, PFDS, PFTrDA and 10:2 FTS. These compounds use an internal standard that is chemically related and has a retention time close to that of the target compound. The DQO for internal standard response is 50-150% of that established at initial calibration. PFOS is quantified using a certified, traceable standard consisting of linear and branched PFOS isomers. These practices are in line with recommendations in the National Environmental Management Plan for PFAS (Australian HEPA) and also conform to QSM 5.3 (US DoD) requirements.



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)		Sample ID		0229_MW226_220302	----	----	----	----
Sampling date / time		02-Mar-2022 07:30		----	----	----	----	----
Compound	CAS Number	LOR	Unit	ET2201357-001	-----	-----	-----	-----
				Result	----	----	----	----
EP231A: Perfluoroalkyl Sulfonic Acids								
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	0.14	----	----	----	----
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	0.06	----	----	----	----
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	0.32	----	----	----	----
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	----	----	----	----
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	0.09	----	----	----	----
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	0.08	----	----	----	----
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	----	----	----	----



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)		Sample ID	0229_MW226_220302	----	----	----	----
		Sampling date / time	02-Mar-2022 07:30	----	----	----	----
Compound	CAS Number	LOR	Unit	ET2201357-001	-----	-----	-----
				Result	----	----	----
EP231C: Perfluoroalkyl Sulfonamides - Continued							
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	0.69	----	----	----
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	0.41	----	----	----
Sum of PFAS (WA DER List)	----	0.01	µg/L	0.63	----	----	----
EP231S: PFAS Surrogate							
13C4-PFOS	----	0.02	%	105	----	----	----
13C8-PFOA	----	0.02	%	100	----	----	----



Surrogate Control Limits

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

Inter-Laboratory Testing

Analysis conducted by ALS Brisbane, NATA accreditation no. 825, site no. 818 (Chemistry) 18958 (Biology).

(WATER) EP231A: Perfluoroalkyl Sulfonic Acids

(WATER) EP231B: Perfluoroalkyl Carboxylic Acids

(WATER) EP231C: Perfluoroalkyl Sulfonamides

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

(WATER) EP231P: PFAS Sums

(WATER) EP231S: PFAS Surrogate



QUALITY CONTROL REPORT

Work Order : ET2201357
Client : AECOM AUSTRALIA PTY LTD
Contact :
Address : PO BOX 5175 TOWNSVILLE QLD, AUSTRALIA 4870
Telephone :
Project : QLD_0229_PFASOMP_20
Order number : 60612487_3.1
C-O-C number : 34553
Sampler :
Site : QLD_0229
Quote number : TV/007/21 v2 - Compass
No. of samples received : 1
No. of samples analysed : 1

Page : 1 of 6
Laboratory : Environmental Division Townsville
Contact :
Address : 13 Carlton Street, Kirwan Townsville QLD Australia 4815
Telephone :
Date Samples Received : 08-Mar-2022
Date Analysis Commenced : 08-Mar-2022
Issue Date : 15-Mar-2022



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.

Table with 3 columns: Signatories, Position, Accreditation Category. Row 1: [Redacted], 2IC Organic Chemist, Brisbane Organics, Stafford, QLD



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: 4217871)									
EB2206188-003	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	<0.04	<0.04	0.0	No Limit
		EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	3.32	3.11	6.6	0% - 20%
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.04	<0.04	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.04	<0.04	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.04	<0.04	0.0	No Limit
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 4217871)									
EB2206188-003	Anonymous	EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.04	<0.04	0.0	No Limit
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	1.10	0.99	10.1	0% - 20%
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	1.57	1.48	5.9	0% - 20%
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.04	<0.04	0.0	No Limit
		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	<0.04	<0.04	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.04	<0.04	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.04	<0.04	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.04	<0.04	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.11	<0.11	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<2.2	<2.2	0.0	No Limit
		EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 4217871)							
EB2206188-003	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.04	<0.04	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.04	<0.04	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.04	<0.04	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: 4217871) - continued									
EB2206188-003	Anonymous	EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.11	<0.11	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.11	<0.11	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.11	<0.11	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.11	<0.11	0.0	No Limit
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 4217871)									
EB2206188-003	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
EP231P: PFAS Sums (QC Lot: 4217871)									
EB2206188-003	Anonymous	EP231X: Sum of PFAS	----	0.01	µg/L	5.99	5.58	7.1	0% - 20%
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	<0.04	<0.04	0.0	No Limit
		EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	5.99	5.58	7.1	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: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report				
				Result	Spike Concentration	Spike Recovery (%)		Acceptable Limits (%)	
						LCS	Low	High	
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4217871)									
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	109	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	113	69.0	134	
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.232 µg/L	103	65.0	140	
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.241 µg/L	100	53.0	142	
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4217871)									
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	102	72.0	129	
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	0.25 µg/L	117	72.0	129	
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	0.25 µg/L	96.8	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	102	71.0	129	
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	0.25 µg/L	104	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	98.8	65.0	144	
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	0.625 µg/L	101	71.0	132	
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4217871)									
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	114	68.0	141	
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	0.625 µg/L	112	60.5	138	
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	0.625 µg/L	88.5	68.3	134	
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	0.625 µg/L	106	62.6	138	
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	0.25 µg/L	128	65.0	136	
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	0.25 µg/L	113	61.0	135	
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4217871)									
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.2343 µg/L	98.4	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	126	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	



Sub-Matrix: WATER

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report Result	Laboratory Control Spike (LCS) Report				
					Spike Concentration	Spike Recovery (%)		Acceptable Limits (%)	
						LCS	Low	High	
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4217871) - continued									
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	0.241 µg/L	106	64.2	133	
EP231P: PFAS Sums (QCLot: 4217871)									
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	Spike Recovery(%) MS	Acceptable Limits (%)		
							Low	High
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4217871)								
EB2206229-001	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.2218 µg/L	124	72.0	130	
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.235 µg/L	111	71.0	127	
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.2352 µg/L	# Not Determined	68.0	131	
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.238 µg/L	130	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	113	53.0	142	
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4217871)								
EB2206229-001	Anonymous	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	1.25 µg/L	92.4	73.0	129	
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.25 µg/L	109	72.0	129	
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.25 µg/L	# Not Determined	72.0	129	
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.25 µg/L	111	72.0	130	
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.25 µg/L	118	71.0	133	
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.25 µg/L	104	69.0	130	
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.25 µg/L	104	71.0	129	
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.25 µg/L	104	69.0	133	
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.25 µg/L	104	72.0	134	
		EP231X: Perfluorotridecanoic acid (PFTTrDA)	72629-94-8	0.25 µg/L	99.2	65.0	144	
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.625 µg/L	103	71.0	132	
		EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4217871)						
EB2206229-001	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.25 µg/L	100	59.0	135	



Sub-Matrix: WATER

Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report			
				Spike Concentration	SpikeRecovery(%) MS	Acceptable Limits (%)	
				Low	High		
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4217871) - continued							
EB2206229-001	Anonymous	EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.625 µg/L	108	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	100	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	112	65.0	136
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.25 µg/L	101	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4217871)							
EB2206229-001	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	112	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.24 µg/L	112	67.0	138
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.2415 µg/L	113	70.0	130

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: ET2201357	Page	: 1 of 4
Client	: AECOM AUSTRALIA PTY LTD	Laboratory	: Environmental Division Townsville
Contact	: [REDACTED]	Telephone	: [REDACTED]
Project	: QLD_0229_PFASOMP_20	Date Samples Received	: 08-Mar-2022
Site	: QLD_0229	Issue Date	: 15-Mar-2022
Sampler	: [REDACTED]	No. of samples received	: 1
Order number	: 60612487_3.1	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.
- 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							
EP231A: Perfluoroalkyl Sulfonic Acids	EB2206229--001	Anonymous	Perfluorohexane sulfonic acid (PFHxS)	355-46-4	Not Determined	----	MS recovery not determined, background level greater than or equal to 4x spike level.
EP231A: Perfluoroalkyl Sulfonic Acids	EB2206229--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.
EP231B: Perfluoroalkyl Carboxylic Acids	EB2206229--001	Anonymous	Perfluorohexanoic acid (PFHxA)	307-24-4	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
EP231A: Perfluoroalkyl Sulfonic Acids							
HDPE (no PTFE) (EP231X) 0229_MW226_220302	02-Mar-2022	09-Mar-2022	29-Aug-2022	✓	09-Mar-2022	29-Aug-2022	✓
EP231B: Perfluoroalkyl Carboxylic Acids							
HDPE (no PTFE) (EP231X) 0229_MW226_220302	02-Mar-2022	09-Mar-2022	29-Aug-2022	✓	09-Mar-2022	29-Aug-2022	✓
EP231C: Perfluoroalkyl Sulfonamides							
HDPE (no PTFE) (EP231X) 0229_MW226_220302	02-Mar-2022	09-Mar-2022	29-Aug-2022	✓	09-Mar-2022	29-Aug-2022	✓
EP231D: (n:2) Fluorotelomer Sulfonic Acids							
HDPE (no PTFE) (EP231X) 0229_MW226_220302	02-Mar-2022	09-Mar-2022	29-Aug-2022	✓	09-Mar-2022	29-Aug-2022	✓
EP231P: PFAS Sums							
HDPE (no PTFE) (EP231X) 0229_MW226_220302	02-Mar-2022	09-Mar-2022	29-Aug-2022	✓	09-Mar-2022	29-Aug-2022	✓



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	Method	Count		Rate (%)			Quality Control Specification
		QC	Regular	Actual	Expected	Evaluation	
Analytical Methods							
Laboratory Duplicates (DUP)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	7	14.29	10.00	✔	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	7	14.29	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	7	14.29	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	7	14.29	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.

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



SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : ET2201357

Client	: AECOM AUSTRALIA PTY LTD	Laboratory	: Environmental Division Townsville
Contact	: [REDACTED]	Contact	: [REDACTED]
Address	: PO BOX 5175 TOWNSVILLE QLD, AUSTRALIA 4870	Address	: 13 Carlton Street, Kirwan Townsville QLD Australia 4815
E-mail	: [REDACTED]	E-mail	: [REDACTED]
Telephone	: ----	Telephone	: [REDACTED]
Facsimile	: ----	Facsimile	: [REDACTED]
Project	: QLD_0229_PFASOMP_20	Page	: 1 of 2
Order number	:	Quote number	: ET2021AECOMAU0001 (TV/007/21 v2 - Compass)
C-O-C number	: 34553	QC Level	: NEPM 2013 B3 & ALS QC Standard
Site	: QLD_0229		
Sampler	: [REDACTED]		

Dates

Date Samples Received	: 08-Mar-2022 09:10	Issue Date	: 08-Mar-2022
Client Requested Due Date	: 16-Mar-2022	Scheduled Reporting Date	: 16-Mar-2022

Delivery Details

Mode of Delivery	: Carrier	Security Seal	: Intact.
No. of coolers/boxes	: 1	Temperature	: 6.1°C - Ice present
Receipt Detail	: HARD ESKY	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
- **08/03/2022: SRN has been resent to acknowledge the reporting date has been updated to the 16/03/22 from the 15/03/22. For any further information regarding these adjustments please contact client services at [REDACTED]**
- *Samples were originally received by ALS Townsville on 04/03/2022 and have been forwarded to ALS Brisbane for analysis. Temperature on arrival in ALS Brisbane has been noted above.
- Discounted Package Prices apply only when specific ALS Group Codes ('W', 'S', 'NT' suites) are referenced on COCs.
- \$\$ conducted by ALS Townsville, NATA accreditation no. 825, (Site no. 23472 for Chemical Testing and Site no. 23313 for Biological Testing)
- Please direct any turn around / technical queries to the laboratory contact designated above.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months ± 1 week) from receipt of samples.
- All remaining analysis will be conducted by ALS Environmental, Brisbane, NATA accreditation no. 825, Site No. 818.
- 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.
- **Please refer to the Proactive Holding Time Report table below which summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory. The laboratory will process these samples unless instructions are received from you indicating you do not wish to proceed. The absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.**



Sample 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)
ET2201357-001	02-Mar-2022 07:30	0229_MW226_220302	✓

Proactive Holding Time Report

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

Requested Deliverables

ACCOUNTS PAYABLE

- A4 - AU Tax Invoice (INV)

Email AP_CustomerService.ANZ@aecom.com

- *AU Certificate of Analysis - NATA (COA)
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)
- A4 - AU Tax Invoice (INV)
- Chain of Custody (CoC) (COC)
- EDI Format - ENMRG (ENMRG)
- EDI Format - ESDAT (ESDAT)

Email
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- EDI Format - ESDAT (ESDAT)

Email

- *AU Certificate of Analysis - NATA (COA)
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)
- A4 - AU Tax Invoice (INV)
- Chain of Custody (CoC) (COC)
- EDI Format - EQUIS V5 AECOM (EQUIS_V5_AECOM)
- EDI Format - ESDAT (ESDAT)

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

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CERTIFICATE OF ANALYSIS

Work Order : **ET2201358**
Client : **AECOM AUSTRALIA PTY LTD**
Contact : [REDACTED]
Address : PO BOX 5175
 TOWNSVILLE QLD, AUSTRALIA 4870
Telephone : ----
Project : QLD_0229_PFSOMP_20
Order number : 60612487_3.1
C-O-C number : 34609
Sampler : [REDACTED]
Site : QLD_0229
Quote number : TV/007/21 v2 - Compass
No. of samples received : 4
No. of samples analysed : 4

Page : 1 of 7
Laboratory : Environmental Division Townsville
Contact : [REDACTED]
Address : 13 Carlton Street, Kirwan Townsville QLD Australia 4815
Telephone : [REDACTED]
Date Samples Received : 08-Mar-2022 09:10
Date Analysis Commenced : 08-Mar-2022
Issue Date : 17-Mar-2022 09:58



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.

<i>Signatories</i>	<i>Position</i>	<i>Accreditation Category</i>
[REDACTED]	Senior Inorganic Chemist	Brisbane Inorganics, Stafford, QLD
[REDACTED]	Senior Organic Chemist	Brisbane Organics, Stafford, QLD



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 Contact 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.
- \$\$ conducted by ALS Townsville, NATA accreditation no. 825, (Site no. 23472 for Chemical Testing and Site no. 23313 for Biological Testing)
- All remaining analysis will be conducted by ALS Environmental, Brisbane, NATA accreditation no. 825, Site No. 818.
- 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.
- 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		0229_SD211_220303	0229_SD212_220303	----	----	----
		Sampling date / time		03-Mar-2022 08:10	03-Mar-2022 07:40	----	----	----
Compound	CAS Number	LOR	Unit	ET2201358-002	ET2201358-004	-----	-----	-----
				Result	Result	----	----	----
EA055: Moisture Content (Dried @ 105-110°C)								
Moisture Content	----	0.1	%	21.4	29.4	----	----	----
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	----	----	----
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	<0.0005	----	----	----



Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)				Sample ID	0229_SD211_220303	0229_SD212_220303	----	----	----
Sampling date / time				03-Mar-2022 08:10	03-Mar-2022 07:40	----	----	----	
Compound	CAS Number	LOR	Unit	ET2201358-002	ET2201358-004	-----	-----	-----	
				Result	Result	----	----	----	
EP231C: Perfluoroalkyl Sulfonamides - Continued									
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	%	84.0	99.0	----	----	----	
13C8-PFOA	----	0.0002	%	110	106	----	----	----	



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)			Sample ID		0229_SW211_220303	0229_SW212_220303	----	----	----
			Sampling date / time		03-Mar-2022 08:09	03-Mar-2022 07:32	----	----	----
Compound	CAS Number	LOR	Unit	ET2201358-001	ET2201358-003	-----	-----	-----	
				Result	Result	----	----	----	
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	0.03	0.04	----	----	----	
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	0.02	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	0.03	0.02	----	----	----	
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	----	----	----	
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	<0.05	----	----	----	



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	0229_SW211_220303	0229_SW212_220303	----	----	----
Sampling date / time				03-Mar-2022 08:09	03-Mar-2022 07:32	----	----	----	
Compound	CAS Number	LOR	Unit	ET2201358-001	ET2201358-003	-----	-----	-----	
				Result	Result	----	----	----	
EP231C: Perfluoroalkyl Sulfonamides - Continued									
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	0.08	0.08	----	----	----	
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	0.05	0.04	----	----	----	
Sum of PFAS (WA DER List)	----	0.01	µg/L	0.08	0.08	----	----	----	
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%	103	101	----	----	----	
13C8-PFOA	----	0.02	%	95.6	95.3	----	----	----	



Surrogate Control Limits

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

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

Inter-Laboratory Testing

Analysis conducted by ALS Brisbane, NATA accreditation no. 825, site no. 818 (Chemistry) 18958 (Biology).

- (WATER) EP231A: Perfluoroalkyl Sulfonic Acids
- (WATER) EP231B: Perfluoroalkyl Carboxylic Acids
- (WATER) EP231C: Perfluoroalkyl Sulfonamides
- (WATER) EP231D: (n:2) Fluorotelomer Sulfonic Acids
- (WATER) EP231P: PFAS Sums
- (WATER) EP231S: PFAS Surrogate
- (SOIL) EP231B: Perfluoroalkyl Carboxylic Acids
- (SOIL) EP231D: (n:2) Fluorotelomer Sulfonic Acids
- (SOIL) EP231C: Perfluoroalkyl Sulfonamides
- (SOIL) EP231A: Perfluoroalkyl Sulfonic Acids
- (SOIL) EP231P: PFAS Sums
- (SOIL) EP231S: PFAS Surrogate
- (SOIL) EA055: Moisture Content (Dried @ 105-110°C)

QUALITY CONTROL REPORT

Work Order : ET2201358 Client : AECOM AUSTRALIA PTY LTD Contact : ██████████ Address : PO BOX 5175 TOWNSVILLE QLD, AUSTRALIA 4870 Telephone : ---- Project : QLD_0229_PFASOMP_20 Order number : 60612487_3.1 C-O-C number : 34609 Sampler : ██████████ Site : QLD_0229 Quote number : TV/007/21 v2 - Compass No. of samples received : 4 No. of samples analysed : 4	Page : 1 of 10 Laboratory : Environmental Division Townsville Contact : ██████████ Address : 13 Carlton Street, Kirwan Townsville QLD Australia 4815 Telephone : ██████████ Date Samples Received : 08-Mar-2022 Date Analysis Commenced : 08-Mar-2022 Issue Date : 17-Mar-2022
--	---



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
██████████	Senior Inorganic Chemist	Brisbane Inorganics, Stafford, QLD
	Senior Organic Chemist	Brisbane Organics, Stafford, QLD



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: 4218943)									
EB2206385-010	Anonymous	EA055: Moisture Content	----	0.1	%	32.5	33.6	3.5	0% - 20%
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 4218942)									
EB2205417-002	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	0.0288	0.0323	11.3	0% - 20%
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	0.0285	0.0315	10.1	0% - 20%
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	0.0877	0.0945	7.4	0% - 20%
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	0.0112	0.0106	5.1	0% - 50%
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	0.427	0.475	10.7	0% - 20%
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0010	<0.0010	0.0	No Limit
ET2201358-004	0229_SD212_220303	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: 4218942)									
EB2205417-002	Anonymous	EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	0.0053	0.0053	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	0.0241	0.0243	0.9	0% - 20%
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	0.0045	0.0043	4.6	No Limit
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	0.0097	0.0098	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0010	<0.0010	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0010	<0.0010	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0010	<0.0010	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0010	<0.0010	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTTrDA)	72629-94-8	0.0002	mg/kg	<0.0010	<0.0010	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: 4218942) - continued									
EB2205417-002	Anonymous	EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0024	<0.0025	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	0.005	<0.005	0.0	No Limit
ET2201358-004	0229_SD212_220303	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: 4218942)									
EB2205417-002	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	0.0027	0.0028	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0010	<0.0010	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0010	<0.0010	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0024	<0.0025	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0024	<0.0025	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0024	<0.0025	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0024	<0.0025	0.0	No Limit
ET2201358-004	0229_SD212_220303	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: 4218942)									



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: 4218942) - continued									
EB2205417-002	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0010	<0.0010	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	0.0306	0.0315	3.0	0% - 20%
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	0.0114	0.0122	6.2	0% - 50%
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	0.0016	0.0017	9.1	No Limit
ET2201358-004	0229_SD212_220303	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: 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: 4217871)									
EB2206188-003	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	<0.04	<0.04	0.0	No Limit
		EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	3.32	3.11	6.6	0% - 20%
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.04	<0.04	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.04	<0.04	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.04	<0.04	0.0	No Limit
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 4217871)									
EB2206188-003	Anonymous	EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.04	<0.04	0.0	No Limit
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	1.10	0.99	10.1	0% - 20%
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	1.57	1.48	5.9	0% - 20%
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.04	<0.04	0.0	No Limit
		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	<0.04	<0.04	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.04	<0.04	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.04	<0.04	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.04	<0.04	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.11	<0.11	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<2.2	<2.2	0.0	No Limit
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 4217871)									
EB2206188-003	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.04	<0.04	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: 4217871) - continued									
EB2206188-003	Anonymous	EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.04	<0.04	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.04	<0.04	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.11	<0.11	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.11	<0.11	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.11	<0.11	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.11	<0.11	0.0	No Limit
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 4217871)									
EB2206188-003	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
EP231P: PFAS Sums (QC Lot: 4217871)									
EB2206188-003	Anonymous	EP231X: Sum of PFAS	----	0.01	µg/L	5.99	5.58	7.1	0% - 20%
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	<0.04	<0.04	0.0	No Limit
		EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	5.99	5.58	7.1	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: **SOIL**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report				
				Result	Spike Concentration	Spike Recovery (%)		Acceptable Limits (%)	
						LCS	Low	High	
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4218942)									
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	0.0011 mg/kg	91.8	72.0	128	
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	0.00117 mg/kg	94.9	73.0	123	
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	0.00118 mg/kg	81.8	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	81.0	68.0	136	
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	0.0012 mg/kg	89.6	59.0	134	
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4218942)									
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	0.00625 mg/kg	99.9	71.0	135	
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	0.00125 mg/kg	84.8	69.0	132	
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	0.00125 mg/kg	86.0	70.0	132	
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	0.00125 mg/kg	86.4	71.0	131	
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	86.0	69.0	133	
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	84.8	72.0	129	
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	0.00125 mg/kg	86.8	69.0	133	
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	88.8	64.0	136	
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	82.0	69.0	135	
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	84.4	66.0	139	
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	0.00312 mg/kg	94.7	69.0	133	
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4218942)									
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	0.00125 mg/kg	101	67.0	137	
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	0.00312 mg/kg	93.8	59.6	143	
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	0.00312 mg/kg	88.6	62.8	140	
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	0.00312 mg/kg	94.7	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	137	
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	95.6	61.0	139	
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4218942)									
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	0.00117 mg/kg	92.7	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	80.1	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	87.9	65.0	137	



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 High	
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4218942) - continued								
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

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 High	
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4217871)								
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	109	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	113	69.0	134
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.232 µg/L	103	65.0	140
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.241 µg/L	100	53.0	142
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4217871)								
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	102	72.0	129
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	0.25 µg/L	117	72.0	129
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	0.25 µg/L	96.8	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	102	71.0	129
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	0.25 µg/L	104	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	98.8	65.0	144
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	0.625 µg/L	101	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4217871)								
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	114	68.0	141
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	0.625 µg/L	112	60.5	138
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	0.625 µg/L	88.5	68.3	134
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	0.625 µg/L	106	62.6	138
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	0.25 µg/L	128	65.0	136
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	0.25 µg/L	113	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4217871)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.2343 µg/L	98.4	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	126	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 (%)	Acceptable Limits (%)	
						LCS	Low	High
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4217871) - continued								
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	106	64.2	133
EP231P: PFAS Sums (QCLot: 4217871)								
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: **SOIL**

Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report			
				Spike Concentration	Spike Recovery(%) MS	Low	High
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4218942)							
EB2205417-004	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0011 mg/kg	# Not Determined	72.0	128
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.00117 mg/kg	80.4	73.0	123
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.00118 mg/kg	# Not Determined	67.0	130
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.00119 mg/kg	81.9	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	70.9	59.0	134
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4218942)							
EB2205417-004	Anonymous	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.00625 mg/kg	75.1	71.0	135
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.00125 mg/kg	79.1	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	79.3	71.0	131
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.00125 mg/kg	94.5	69.0	133
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.00125 mg/kg	75.9	72.0	129
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.00125 mg/kg	72.2	69.0	133
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.00125 mg/kg	80.2	64.0	136
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.00125 mg/kg	84.0	69.0	135
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.00125 mg/kg	88.2	66.0	139
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.00312 mg/kg	70.8	69.0	133
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4218942)							



Sub-Matrix: **SOIL**

				Matrix Spike (MS) Report			
				Spike Concentration	SpikeRecovery(%) MS	Acceptable Limits (%)	
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4218942) - continued							
EB2205417-004	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.00125 mg/kg	99.5	48.0	128
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.00312 mg/kg	78.5	70.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.00312 mg/kg	86.6	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.00312 mg/kg	78.4	70.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.00312 mg/kg	72.3	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.00125 mg/kg	68.5	63.0	144
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.00125 mg/kg	76.0	61.0	139
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4218942)							
EB2205417-004	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.00117 mg/kg	68.3	62.0	145
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.00118 mg/kg	# Not Determined	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0012 mg/kg	76.8	65.0	137
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0012 mg/kg	83.1	70.0	130

Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike Concentration	SpikeRecovery(%) MS	Acceptable Limits (%)	
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4217871)							
EB2206229-001	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.2218 µg/L	124	72.0	130
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.235 µg/L	111	71.0	127
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.2352 µg/L	# Not Determined	68.0	131
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.238 µg/L	130	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	113	53.0	142
		EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4217871)					
EB2206229-001	Anonymous	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	1.25 µg/L	92.4	73.0	129
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.25 µg/L	109	72.0	129
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.25 µg/L	# Not Determined	72.0	129
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.25 µg/L	111	72.0	130
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.25 µg/L	118	71.0	133
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.25 µg/L	104	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: 4217871) - continued							
EB2206229-001	Anonymous	EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.25 µg/L	104	71.0	129
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.25 µg/L	104	69.0	133
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.25 µg/L	104	72.0	134
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.25 µg/L	99.2	65.0	144
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.625 µg/L	103	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4217871)							
EB2206229-001	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.25 µg/L	100	59.0	135
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.625 µg/L	108	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	100	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	112	65.0	136
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.25 µg/L	101	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4217871)							
EB2206229-001	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	112	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.24 µg/L	112	67.0	138
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.2415 µg/L	113	70.0	130

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: ET2201358	Page	: 1 of 5
Client	: AECOM AUSTRALIA PTY LTD	Laboratory	: Environmental Division Townsville
Contact	: [REDACTED]	Telephone	: [REDACTED]
Project	: QLD_0229_PFASOMP_20	Date Samples Received	: 08-Mar-2022
Site	: QLD_0229	Issue Date	: 17-Mar-2022
Sampler	: [REDACTED]	No. of samples received	: 4
Order number	: 60612487_3.1	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: **SOIL**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
Matrix Spike (MS) Recoveries							
EP231A: Perfluoroalkyl Sulfonic Acids	EB2205417--004	Anonymous	Perfluorobutane sulfonic acid (PFBS)	375-73-5	Not Determined	----	MS recovery not determined, background level greater than or equal to 4x spike level.
EP231A: Perfluoroalkyl Sulfonic Acids	EB2205417--004	Anonymous	Perfluorohexane sulfonic acid (PFHxS)	355-46-4	Not Determined	----	MS recovery not determined, background level greater than or equal to 4x spike level.
EP231A: Perfluoroalkyl Sulfonic Acids	EB2205417--004	Anonymous	Perfluorooctane sulfonic acid (PFOS)	1763-23-1	Not Determined	----	MS recovery not determined, background level greater than or equal to 4x spike level.
EP231D: (n:2) Fluorotelomer Sulfonic Acids	EB2205417--004	Anonymous	6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	Not Determined	----	MS recovery not determined, background level greater than or equal to 4x spike level.

Matrix: **WATER**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
Matrix Spike (MS) Recoveries							
EP231A: Perfluoroalkyl Sulfonic Acids	EB2206229--001	Anonymous	Perfluorohexane sulfonic acid (PFHxS)	355-46-4	Not Determined	----	MS recovery not determined, background level greater than or equal to 4x spike level.
EP231A: Perfluoroalkyl Sulfonic Acids	EB2206229--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.
EP231B: Perfluoroalkyl Carboxylic Acids	EB2206229--001	Anonymous	Perfluorohexanoic acid (PFHxA)	307-24-4	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: **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



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) 0229_SD211_220303,	0229_SD212_220303	03-Mar-2022	----	----	----	10-Mar-2022	17-Mar-2022	✓	
EP231A: Perfluoroalkyl Sulfonic Acids									
HDPE Soil Jar (EP231X) 0229_SD211_220303,	0229_SD212_220303	03-Mar-2022	14-Mar-2022	30-Aug-2022	✓	14-Mar-2022	23-Apr-2022	✓	
EP231B: Perfluoroalkyl Carboxylic Acids									
HDPE Soil Jar (EP231X) 0229_SD211_220303,	0229_SD212_220303	03-Mar-2022	14-Mar-2022	30-Aug-2022	✓	14-Mar-2022	23-Apr-2022	✓	
EP231C: Perfluoroalkyl Sulfonamides									
HDPE Soil Jar (EP231X) 0229_SD211_220303,	0229_SD212_220303	03-Mar-2022	14-Mar-2022	30-Aug-2022	✓	14-Mar-2022	23-Apr-2022	✓	
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
HDPE Soil Jar (EP231X) 0229_SD211_220303,	0229_SD212_220303	03-Mar-2022	14-Mar-2022	30-Aug-2022	✓	14-Mar-2022	23-Apr-2022	✓	
EP231P: PFAS Sums									
HDPE Soil Jar (EP231X) 0229_SD211_220303,	0229_SD212_220303	03-Mar-2022	14-Mar-2022	30-Aug-2022	✓	14-Mar-2022	23-Apr-2022	✓	

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) 0229_SW211_220303,	0229_SW212_220303	03-Mar-2022	09-Mar-2022	30-Aug-2022	✓	09-Mar-2022	30-Aug-2022	✓	
EP231B: Perfluoroalkyl Carboxylic Acids									
HDPE (no PTFE) (EP231X) 0229_SW211_220303,	0229_SW212_220303	03-Mar-2022	09-Mar-2022	30-Aug-2022	✓	09-Mar-2022	30-Aug-2022	✓	
EP231C: Perfluoroalkyl Sulfonamides									
HDPE (no PTFE) (EP231X) 0229_SW211_220303,	0229_SW212_220303	03-Mar-2022	09-Mar-2022	30-Aug-2022	✓	09-Mar-2022	30-Aug-2022	✓	
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
HDPE (no PTFE) (EP231X) 0229_SW211_220303,	0229_SW212_220303	03-Mar-2022	09-Mar-2022	30-Aug-2022	✓	09-Mar-2022	30-Aug-2022	✓	
EP231P: PFAS Sums									
HDPE (no PTFE) (EP231X) 0229_SW211_220303,	0229_SW212_220303	03-Mar-2022	09-Mar-2022	30-Aug-2022	✓	09-Mar-2022	30-Aug-2022	✓	



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	Method	Count		Rate (%)			Quality Control Specification
		QC	Regular	Actual	Expected	Evaluation	
Analytical Methods							
Laboratory Duplicates (DUP)							
Moisture Content	EA055	1	5	20.00	10.00	✔	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	11	18.18	10.00	✔	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	11	9.09	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	11	9.09	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	11	9.09	5.00	✔	NEPM 2013 B3 & ALS QC Standard

Matrix: WATER

Evaluation: ✖ = Quality Control frequency not within specification ; ✔ = Quality Control frequency within specification.

Quality Control Sample Type	Method	Count		Rate (%)			Quality Control Specification
		QC	Regular	Actual	Expected	Evaluation	
Analytical Methods							
Laboratory Duplicates (DUP)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	7	14.29	10.00	✔	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	7	14.29	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	7	14.29	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	7	14.29	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.
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
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.
Solid Phase Extraction (SPE) for PFAS in water	ORG72	WATER	In-house: Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to the sample container. The entire contents are transferred to a solid phase extraction (SPE) cartridge. The sample container is successively rinsed with aliquots of the elution solvent. The eluted extract is combined with an equal volume of reagent water and a portion is filtered for analysis. Method procedures conform to US DoD QSM 5.3, table B-15 requirements.



SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : ET2201358

Client : AECOM AUSTRALIA PTY LTD
Contact :
Address : PO BOX 5175 TOWNSVILLE QLD, AUSTRALIA 4870
Laboratory : Environmental Division Townsville
Contact :
Address : 13 Carlton Street, Kirwan Townsville QLD Australia 4815
E-mail :
Telephone :
Facsimile :
Project : QLD_0229_PFASOMP_20
Order number :
Page : 1 of 3
Quote number : ET2021AECOMAU0001 (TV/007/21 v2 - Compass)
C-O-C number : 34609
QC Level : NEPM 2013 B3 & ALS QC Standard
Site : QLD_0229
Sampler :

Dates

Date Samples Received : 08-Mar-2022 09:10
Issue Date : 08-Mar-2022
Client Requested Due Date : 16-Mar-2022
Scheduled Reporting Date : 16-Mar-2022

Delivery Details

Mode of Delivery : Carrier
Security Seal : Intact.
No. of coolers/boxes : 1
Temperature : 6.1°C - Ice present
Receipt Detail : HARD ESKY
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
*Samples were originally received by ALS Townsville on 04/03/2022 and have been forwarded to ALS Brisbane for analysis.
Temperature on arrival in ALS Brisbane has been noted above.
Discounted Package Prices apply only when specific ALS Group Codes ('W', 'S', 'NT' suites) are referenced on COCs.
\$\$ conducted by ALS Townsville, NATA accreditation no. 825, (Site no. 23472 for Chemical Testing and Site no. 23313 for Biological Testing)
Please direct any turn around / technical queries to the laboratory contact designated above.
Sample Disposal - Aqueous (3 weeks), Solid (2 months ± 1 week) from receipt of samples.
All remaining analysis will be conducted by ALS Environmental, Brisbane, NATA accreditation no. 825, Site No. 818.
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.
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.



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)
ET2201358-002	03-Mar-2022 08:10	0229_SD211_220303	✓	✓
ET2201358-004	03-Mar-2022 07:40	0229_SD212_220303	✓	✓

Matrix: **WATER**

Laboratory sample ID	Sampling date / time	Sample ID	WATER - EP231X PFAS - Full Suite (28 analytes)
ET2201358-001	03-Mar-2022 08:09	0229_SW211_220303	✓
ET2201358-003	03-Mar-2022 07:32	0229_SW212_220303	✓

Proactive Holding Time Report

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



Requested Deliverables

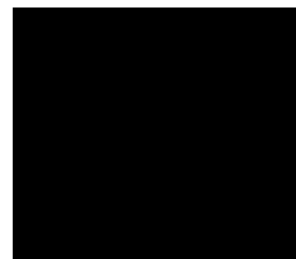
ACCOUNTS PAYABLE

- A4 - AU Tax Invoice (INV)

Email AP_CustomerService.ANZ@aecom.com

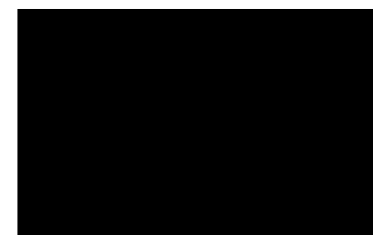
- *AU Certificate of Analysis - NATA (COA)
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)
- A4 - AU Tax Invoice (INV)
- Chain of Custody (CoC) (COC)
- EDI Format - ENMRG (ENMRG)
- EDI Format - ESDAT (ESDAT)

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

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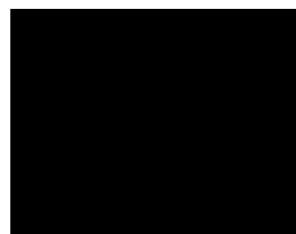
- *AU Certificate of Analysis - NATA (COA)
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)
- A4 - AU Tax Invoice (INV)
- Chain of Custody (CoC) (COC)
- EDI Format - EQUIS V5 AECOM (EQUIS_V5_AECOM)
- EDI Format - ESDAT (ESDAT)

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

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CERTIFICATE OF ANALYSIS

Work Order : **ET2201359**
Client : **AECOM AUSTRALIA PTY LTD**
Contact : [REDACTED]
Address : PO BOX 1307
 FORTITUDE VALLEY QLD, AUSTRALIA 4006
Telephone : ----
Project : QLD_0229_PFASOMP_20
Order number : 60612487_3.1
C-O-C number : 34488
Sampler : [REDACTED]
Site : QLD_0229
Quote number : TV/007/21 v2 - Compass
No. of samples received : 101
No. of samples analysed : 100

Page : 1 of 45
Laboratory : Environmental Division Townsville
Contact : [REDACTED]
Address : 13 Carlton Street, Kirwan Townsville QLD Australia 4815
Telephone : [REDACTED]
Date Samples Received : 08-Mar-2022 09:10
Date Analysis Commenced : 08-Mar-2022
Issue Date : 18-Mar-2022 17:27



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.

<i>Signatories</i>	<i>Position</i>	<i>Accreditation Category</i>
[REDACTED]	Senior Inorganic Chemist	Brisbane Inorganics, Stafford, QLD
[REDACTED]	2IC Organic Chemist	Brisbane Organics, Stafford, QLD



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 Contact 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.
- All analysis will be conducted by ALS Environmental, Brisbane, NATA accreditation no. 825, Site No. 818.
- EP231X PFAS: Whole bottle extraction was not possible for particular samples. Samples required dilution prior to extraction due to the presence of high level contaminants and matrix interferences (high sediment content). LOR values have been adjusted accordingly.
- EP231X PFAS: Sample '0229_SD109_220301' (ET2201359-004) required dilution prior to analysis due to the presence of high level contaminants. LOR values have been adjusted accordingly. The LORs of PFBA and PFUnDA have been raised further due to matrix interference.
- EP231X PFAS: Limits of reporting for sample '0229_SD144_220301' (ET2201359-007) have been raised due to the high moisture content of the sample. The LOR of PFBS has been raised further due to matrix interference.
- EP231X PFAS: Sample '0229_SD140_220301' (ET2201359-002) shows poor duplicate results due to sample heterogeneity. Confirmed by visual inspection.
- EP231X PFAS: The LOR of PFDS for sample '0229_QC103_220301' (ET2201359-012) has been raised due to sample matrix interferences.
- 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.
- 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: SOIL (Matrix: SOIL)				Sample ID	0229_SD140_220301	0229_SD109_220301	0229_SD110_220301	0229_SD144_220301	0229_SD139_220301
Sampling date / time				01-Mar-2022 10:30	01-Mar-2022 11:11	01-Mar-2022 11:35	01-Mar-2022 11:55	01-Mar-2022 12:54	
Compound	CAS Number	LOR	Unit	ET2201359-002	ET2201359-004	ET2201359-005	ET2201359-007	ET2201359-011	
				Result	Result	Result	Result	Result	
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content	----	0.1	%	30.4	30.2	39.2	89.7	40.0	
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	0.0055	0.0012	<0.0009	0.0002	
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	0.0063	0.0015	<0.0002	0.0003	
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	0.0012	0.0635	0.0168	0.0024	0.0057	
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	0.0051	0.0024	<0.0002	0.0015	
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	0.0167	0.253	0.161	0.0325	0.0705	
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	0.0005	0.0017	0.0013	<0.0002	0.0004	
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	<0.002	<0.001	<0.001	<0.001	
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	0.0029	0.0005	<0.0002	<0.0002	
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	0.0153	0.0027	<0.0002	0.0004	
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	0.0021	0.0003	<0.0002	<0.0002	
Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	0.0076	0.0017	<0.0002	0.0004	
Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	0.0005	0.0003	<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	<0.0004	0.0003	<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	0.0005	<0.0002	<0.0002	<0.0002	
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	<0.0006	<0.0005	<0.0006	<0.0005	
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	0.0072	0.0012	<0.0002	<0.0002	
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	<0.0006	<0.0005	<0.0006	<0.0005	



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	0229_SD140_220301	0229_SD109_220301	0229_SD110_220301	0229_SD144_220301	0229_SD139_220301
Sampling date / time				01-Mar-2022 10:30	01-Mar-2022 11:11	01-Mar-2022 11:35	01-Mar-2022 11:55	01-Mar-2022 12:54	
Compound	CAS Number	LOR	Unit	ET2201359-002	ET2201359-004	ET2201359-005	ET2201359-007	ET2201359-011	
				Result	Result	Result	Result	Result	
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	<0.0006	<0.0005	<0.0006	<0.0005	
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	<0.0006	<0.0005	<0.0006	<0.0005	
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	<0.0006	<0.0005	<0.0006	<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	0.0184	0.371	0.191	0.0349	0.0794	
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg	0.0179	0.316	0.178	0.0349	0.0762	
Sum of PFAS (WA DER List)	----	0.0002	mg/kg	0.0179	0.350	0.184	0.0349	0.0772	
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.0002	%	102	102	111	120	96.0	
13C8-PFOA	----	0.0002	%	100	90.0	100	104	104	



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	0229_QC103_220301	0229_SD113_220301	0229_SD119_220301	0229_SD120_220301	0229_SD135_220301
Sampling date / time				01-Mar-2022 12:55	01-Mar-2022 13:22	01-Mar-2022 14:20	01-Mar-2022 14:35	01-Mar-2022 14:48	
Compound	CAS Number	LOR	Unit	ET2201359-012	ET2201359-013	ET2201359-015	ET2201359-017	ET2201359-019	
				Result	Result	Result	Result	Result	
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content	----	0.1	%	46.0	1.3	21.2	3.4	20.2	
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	0.0037	<0.0002	0.0003	<0.0002	<0.0002	
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	0.0008	<0.0002	<0.0002	<0.0002	<0.0002	
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	0.0365	<0.0002	0.0003	0.0006	0.0012	
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0003	<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	
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	0229_QC103_220301	0229_SD113_220301	0229_SD119_220301	0229_SD120_220301	0229_SD135_220301
Sampling date / time				01-Mar-2022 12:55	01-Mar-2022 13:22	01-Mar-2022 14:20	01-Mar-2022 14:35	01-Mar-2022 14:48	
Compound	CAS Number	LOR	Unit	ET2201359-012	ET2201359-013	ET2201359-015	ET2201359-017	ET2201359-019	
				Result	Result	Result	Result	Result	
EP231C: Perfluoroalkyl Sulfonamides - Continued									
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	0.0414	<0.0002	0.0006	0.0006	0.0012	
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg	0.0402	<0.0002	0.0006	0.0006	0.0012	
Sum of PFAS (WA DER List)	----	0.0002	mg/kg	0.0406	<0.0002	0.0006	0.0006	0.0012	
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.0002	%	122	82.5	105	101	96.5	
13C8-PFOA	----	0.0002	%	110	105	94.5	102	100	



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	0229_SD133_220301	0229_SD134_220301	0229_SD244_220228	0229_SD245_220228	0229_QC101_220228
Sampling date / time				01-Mar-2022 15:27	01-Mar-2022 15:39	28-Feb-2022 10:20	28-Feb-2022 08:45	28-Feb-2022 10:20	
Compound	CAS Number	LOR	Unit	ET2201359-021	ET2201359-022	ET2201359-028	ET2201359-030	ET2201359-033	
				Result	Result	Result	Result	Result	
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content	----	0.1	%	1.5	16.7	17.6	60.9	15.3	
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	0.0006	<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	
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	0229_SD133_220301	0229_SD134_220301	0229_SD244_220228	0229_SD245_220228	0229_QC101_220228
Sampling date / time					01-Mar-2022 15:27	01-Mar-2022 15:39	28-Feb-2022 10:20	28-Feb-2022 08:45	28-Feb-2022 10:20
Compound	CAS Number	LOR	Unit	ET2201359-021	ET2201359-022	ET2201359-028	ET2201359-030	ET2201359-033	ET2201359-033
				Result	Result	Result	Result	Result	Result
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	<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	<0.0005
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	<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	<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	<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	<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	<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	<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	<0.0005
EP231P: PFAS Sums									
Sum of PFAS	----	0.0002	mg/kg	0.0006	<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	0.0006	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Sum of PFAS (WA DER List)	----	0.0002	mg/kg	0.0006	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.0002	%	81.0	96.0	91.5	82.5	93.0	93.0
13C8-PFOA	----	0.0002	%	101	107	102	97.0	101	101



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	0229_SD227_220228	0229_SD136_220302	0229_SD128_220302	0229_SD130_220302	0229_SD243_220302
Sampling date / time				28-Feb-2022 11:30	02-Mar-2022 09:00	02-Mar-2022 10:50	02-Mar-2022 09:30	02-Mar-2022 14:10	
Compound	CAS Number	LOR	Unit	ET2201359-036	ET2201359-080	ET2201359-081	ET2201359-082	ET2201359-083	
				Result	Result	Result	Result	Result	
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content	----	0.1	%	41.7	18.6	1.6	3.0	30.2	
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	0.0003	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	0.0008	0.0014	0.0010	0.0003	
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	
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	0229_SD227_220228	0229_SD136_220302	0229_SD128_220302	0229_SD130_220302	0229_SD243_220302
Sampling date / time				28-Feb-2022 11:30	02-Mar-2022 09:00	02-Mar-2022 10:50	02-Mar-2022 09:30	02-Mar-2022 14:10	
Compound	CAS Number	LOR	Unit	ET2201359-036	ET2201359-080	ET2201359-081	ET2201359-082	ET2201359-083	
				Result	Result	Result	Result	Result	
EP231C: Perfluoroalkyl Sulfonamides - Continued									
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	0.0008	0.0017	0.0012	0.0003	
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg	<0.0002	0.0008	0.0017	0.0012	0.0003	
Sum of PFAS (WA DER List)	----	0.0002	mg/kg	<0.0002	0.0008	0.0017	0.0012	0.0003	
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.0002	%	101	98.5	89.5	84.5	95.0	
13C8-PFOA	----	0.0002	%	100	101	106	97.0	96.5	



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	0229_QC105_220302	0229_SD205_220302	0229_SD217_220302	0229_SD126_220302	0229_SD203_220302
Sampling date / time				02-Mar-2022 12:00	02-Mar-2022 11:30	02-Mar-2022 13:00	02-Mar-2022 11:00	02-Mar-2022 12:00	
Compound	CAS Number	LOR	Unit	ET2201359-084	ET2201359-085	ET2201359-086	ET2201359-087	ET2201359-088	
				Result	Result	Result	Result	Result	
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content	----	0.1	%	21.2	17.8	68.5	16.8	22.7	
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	0.0003	<0.0002	0.0009	<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	
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	0229_QC105_220302	0229_SD205_220302	0229_SD217_220302	0229_SD126_220302	0229_SD203_220302
Sampling date / time					02-Mar-2022 12:00	02-Mar-2022 11:30	02-Mar-2022 13:00	02-Mar-2022 11:00	02-Mar-2022 12:00
Compound	CAS Number	LOR	Unit		ET2201359-084	ET2201359-085	ET2201359-086	ET2201359-087	ET2201359-088
				Result	Result	Result	Result	Result	Result
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	<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	<0.0005
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	<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	<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	<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	<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	<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	<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	<0.0005
EP231P: PFAS Sums									
Sum of PFAS	----	0.0002	mg/kg	0.0003	<0.0002	0.0009	<0.0002	0.0002	0.0002
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg	0.0003	<0.0002	0.0009	<0.0002	0.0002	0.0002
Sum of PFAS (WA DER List)	----	0.0002	mg/kg	0.0003	<0.0002	0.0009	<0.0002	0.0002	0.0002
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.0002	%	96.5	91.0	91.0	82.5	80.0	80.0
13C8-PFOA	----	0.0002	%	83.0	91.0	103	92.5	91.5	91.5



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	0229_SD129_220302	0229_SD232_220302	0229_SD220_220302	0229_SD233_220302	----
Sampling date / time				02-Mar-2022 09:50	02-Mar-2022 14:30	02-Mar-2022 13:25	02-Mar-2022 12:38	----	----
Compound	CAS Number	LOR	Unit	ET2201359-089	ET2201359-090	ET2201359-091	ET2201359-092	-----	----
				Result	Result	Result	Result	----	
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content	----	0.1	%	<0.1	47.7	30.0	34.2	----	----
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	0.0007	0.0008	0.0010	----	----
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	0.0004	0.0007	0.0042	0.0071	----	----
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	----	----
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	<0.0005	----	----



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	0229_SD129_220302	0229_SD232_220302	0229_SD220_220302	0229_SD233_220302	----
Sampling date / time				02-Mar-2022 09:50	02-Mar-2022 14:30	02-Mar-2022 13:25	02-Mar-2022 12:38	----	----
Compound	CAS Number	LOR	Unit	ET2201359-089	ET2201359-090	ET2201359-091	ET2201359-092	-----	----
				Result	Result	Result	Result	----	
EP231C: Perfluoroalkyl Sulfonamides - Continued									
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	0.0004	0.0014	0.0050	0.0081	----	----
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg	0.0004	0.0014	0.0050	0.0081	----	----
Sum of PFAS (WA DER List)	----	0.0002	mg/kg	0.0004	0.0014	0.0050	0.0081	----	----
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.0002	%	84.5	77.0	89.5	85.0	----	----
13C8-PFOA	----	0.0002	%	94.0	90.5	88.0	86.0	----	----



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	0229_SW140_220301	0229_SW109_220301	0229_SW110_220301	0229_SW144_220301	0229_SW139_220301
Sampling date / time				01-Mar-2022 10:30	01-Mar-2022 11:11	01-Mar-2022 11:36	01-Mar-2022 11:56	01-Mar-2022 12:53	
Compound	CAS Number	LOR	Unit	ET2201359-001	ET2201359-003	ET2201359-006	ET2201359-008	ET2201359-009	
				Result	Result	Result	Result	Result	
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	0.04	15.1	2.13	<0.02	0.05	
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	0.03	16.1	2.18	<0.02	0.04	
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	0.21	103	13.0	0.06	0.31	
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	5.13	0.81	<0.02	<0.02	
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	0.37	89.2	17.0	0.07	0.55	
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	<0.22	<0.02	<0.02	<0.02	
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	4.0	0.6	<0.1	<0.1	
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	8.21	0.98	<0.02	<0.02	
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	0.05	41.1	4.98	<0.02	0.08	
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	4.36	0.48	<0.02	<0.02	
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	0.02	11.3	1.14	<0.01	0.03	
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	<0.22	<0.02	<0.02	<0.02	
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	<0.22	<0.02	<0.02	<0.02	
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	<0.22	<0.02	<0.02	<0.02	
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	<0.22	<0.02	<0.02	<0.02	
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	<0.22	<0.02	<0.02	<0.02	
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	<0.56	<0.06	<0.05	<0.05	
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	<0.22	<0.02	<0.02	<0.02	
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	<0.56	<0.06	<0.05	<0.05	
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	<0.56	<0.06	<0.05	<0.05	



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	0229_SW140_220301	0229_SW109_220301	0229_SW110_220301	0229_SW144_220301	0229_SW139_220301
Sampling date / time				01-Mar-2022 10:30	01-Mar-2022 11:11	01-Mar-2022 11:36	01-Mar-2022 11:56	01-Mar-2022 12:53	
Compound	CAS Number	LOR	Unit	ET2201359-001	ET2201359-003	ET2201359-006	ET2201359-008	ET2201359-009	
				Result	Result	Result	Result	Result	
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	<0.56	<0.06	<0.05	<0.05	
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	<0.56	<0.06	<0.05	<0.05	
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	<0.22	<0.02	<0.02	<0.02	
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	<0.22	<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	<0.22	<0.05	<0.05	<0.05	
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	<0.22	<0.05	<0.05	<0.05	
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	<0.22	<0.05	<0.05	<0.05	
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	<0.22	<0.05	<0.05	<0.05	
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L	0.72	298	43.3	0.13	1.06	
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	0.58	192	30.0	0.13	0.86	
Sum of PFAS (WA DER List)	----	0.01	µg/L	0.69	276	40.3	0.13	1.02	
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%	90.1	86.5	97.6	95.5	100	
13C8-PFOA	----	0.02	%	95.4	93.6	97.7	98.4	98.7	



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	0229_QC102_220301	0229_SW113_220301	0229_SW119_220301	0229_SW135_220301	0229_SW121_220301
Sampling date / time				01-Mar-2022 12:54	01-Mar-2022 13:22	01-Mar-2022 14:21	01-Mar-2022 14:47	01-Mar-2022 15:14	
Compound	CAS Number	LOR	Unit	ET2201359-010	ET2201359-014	ET2201359-016	ET2201359-018	ET2201359-020	
				Result	Result	Result	Result	Result	
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	0.05	0.04	0.16	0.04	0.12	
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	0.04	<0.02	0.11	<0.02	0.07	
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	0.31	0.14	0.66	0.15	0.46	
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	0.54	0.08	0.28	0.25	0.36	
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02	
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1	
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	<0.02	0.03	<0.02	0.03	
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	0.08	<0.02	0.18	0.02	0.13	
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	<0.01	0.03	<0.01	0.03	
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02	
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02	
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02	
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02	
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02	
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05	
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02	
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05	
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05	



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	0229_QC102_220301	0229_SW113_220301	0229_SW119_220301	0229_SW135_220301	0229_SW121_220301
Sampling date / time				01-Mar-2022 12:54	01-Mar-2022 13:22	01-Mar-2022 14:21	01-Mar-2022 14:47	01-Mar-2022 15:14	
Compound	CAS Number	LOR	Unit	ET2201359-010	ET2201359-014	ET2201359-016	ET2201359-018	ET2201359-020	
				Result	Result	Result	Result	Result	
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05	
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05	
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02	
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02	
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05	
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05	
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05	
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05	
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L	1.05	0.26	1.45	0.46	1.20	
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	0.85	0.22	0.94	0.40	0.82	
Sum of PFAS (WA DER List)	----	0.01	µg/L	1.01	0.26	1.34	0.46	1.13	
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%	91.4	104	93.6	95.7	86.4	
13C8-PFOA	----	0.02	%	101	99.1	102	102	100	



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	0229_SW132_220301	0229_QC301_220301	0229_MW125S_22030 2	0229_MW125I_22030 2	0229_MW124_220302
Sampling date / time				01-Mar-2022 15:53	01-Mar-2022 17:38	02-Mar-2022 09:33	02-Mar-2022 09:30	02-Mar-2022 09:41	
Compound	CAS Number	LOR	Unit	ET2201359-023	ET2201359-024	ET2201359-025	ET2201359-026	ET2201359-027	
				Result	Result	Result	Result	Result	
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	0.08	<0.02	0.38	0.04	<0.02	
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	0.06	<0.02	0.24	0.03	<0.02	
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	0.41	<0.01	1.36	0.18	<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	0.58	<0.01	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	
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	0.11	<0.02	<0.02	
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	0.09	<0.02	0.54	0.04	<0.02	
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	<0.02	0.03	<0.02	<0.02	
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	0.03	<0.01	0.02	<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	<0.06	
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	<0.06	
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.06	



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	0229_SW132_220301	0229_QC301_220301	0229_MW125S_22030 2	0229_MW125I_22030 2	0229_MW124_220302
Sampling date / time				01-Mar-2022 15:53	01-Mar-2022 17:38	02-Mar-2022 09:33	02-Mar-2022 09:30	02-Mar-2022 09:41	
Compound	CAS Number	LOR	Unit	ET2201359-023	ET2201359-024	ET2201359-025	ET2201359-026	ET2201359-027	
				Result	Result	Result	Result	Result	
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.06	
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.06	
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	0.50	<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	1.25	<0.01	3.19	0.32	<0.02	
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	0.99	<0.01	1.37	0.21	<0.02	
Sum of PFAS (WA DER List)	----	0.01	µg/L	1.19	<0.01	2.95	0.29	<0.02	
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%	96.4	98.2	100	93.6	97.1	
13C8-PFOA	----	0.02	%	99.1	103	103	101	103	



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	0229_SW244_220228	0229_SW245_220228	0229_QC100_220228	0229_QC300_220228	0229_SW227_220228
Sampling date / time					28-Feb-2022 10:20	28-Feb-2022 08:45	28-Feb-2022 10:20	28-Feb-2022 12:15	28-Feb-2022 11:30
Compound	CAS Number	LOR	Unit	ET2201359-029	ET2201359-031	ET2201359-032	ET2201359-034	ET2201359-035	ET2201359-035
				Result	Result	Result	Result	Result	Result
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	<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	<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	<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	<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	<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	<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	<0.05
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L	<0.01	<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	<0.01
Sum of PFAS (WA DER List)	----	0.01	µg/L	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%	102	88.1	95.4	93.2	105	105
13C8-PFOA	----	0.02	%	99.6	103	99.9	99.8	97.4	97.4



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	0229_MW233_220303	0229_MW212_220303	0229_MW217_220303	0229_QC106_220303	0229_MW235S_220303 3
Sampling date / time				03-Mar-2022 10:13	03-Mar-2022 10:30	03-Mar-2022 11:12	03-Mar-2022 11:14	03-Mar-2022 11:41	
Compound	CAS Number	LOR	Unit	ET2201359-037	ET2201359-038	ET2201359-039	ET2201359-040	ET2201359-041	
				Result	Result	Result	Result	Result	
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05	<0.06
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05	<0.06
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	<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	<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	<0.05
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	<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	<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	<0.05
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L	<0.01	<0.01	0.16	0.15	<0.02	<0.02
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	<0.01	<0.01	0.10	0.09	<0.02	<0.02
Sum of PFAS (WA DER List)	----	0.01	µg/L	<0.01	<0.01	0.16	0.15	<0.02	<0.02
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%	104	90.4	102	95.7	90.6	90.6
13C8-PFOA	----	0.02	%	98.7	102	105	101	103	103



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	0229_MW205S_22030 3	0229_MW220S_22030 3	0229_QC107_220303	0229_MW106_220303	0229_MW232_220303
Sampling date / time				03-Mar-2022 12:01	03-Mar-2022 12:28	03-Mar-2022 12:28	03-Mar-2022 11:56	03-Mar-2022 12:56	
Compound	CAS Number	LOR	Unit	ET2201359-042 Result	ET2201359-043 Result	ET2201359-044 Result	ET2201359-046 Result	ET2201359-047 Result	
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.13	0.12	0.06	0.10	
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.08	0.10	<0.02	<0.02	
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	0.02	0.47	0.49	0.12	0.09	
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	0.02	0.05	0.10	
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02	
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1	
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02	
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02	
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02	
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	<0.01	<0.01	<0.01	<0.01	
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02	
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02	
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02	
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02	
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02	
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05	
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02	
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05	
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05	



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	0229_MW205S_22030 3	0229_MW220S_22030 3	0229_QC107_220303	0229_MW106_220303	0229_MW232_220303
Sampling date / time					03-Mar-2022 12:01	03-Mar-2022 12:28	03-Mar-2022 12:28	03-Mar-2022 11:56	03-Mar-2022 12:56
Compound	CAS Number	LOR	Unit	ET2201359-042	ET2201359-043	ET2201359-044	ET2201359-046	ET2201359-047	ET2201359-047
				Result	Result	Result	Result	Result	Result
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	<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	<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	<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	<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	0.07
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	<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	<0.05
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L	0.04	0.69	0.73	0.23	0.36	0.36
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	0.04	0.48	0.51	0.17	0.19	0.19
Sum of PFAS (WA DER List)	----	0.01	µg/L	0.04	0.61	0.63	0.23	0.36	0.36
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%	106	102	101	95.9	98.2	98.2
13C8-PFOA	----	0.02	%	101	95.3	97.5	99.9	98.4	98.4



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)			Sample ID	0229_MW131_220303	0229_MW072_220303	0229_MW003_220303	0229_MW074_220303	0229_MW1231_220303 3
Sampling date / time			03-Mar-2022 13:10	03-Mar-2022 13:35	03-Mar-2022 13:37	03-Mar-2022 13:51	03-Mar-2022 13:52	
Compound	CAS Number	LOR	Unit	ET2201359-048 Result	ET2201359-049 Result	ET2201359-050 Result	ET2201359-051 Result	ET2201359-052 Result
EP231A: Perfluoroalkyl Sulfonic Acids								
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	0.74	5.39	<0.02	4.85	0.52
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	0.64	5.27	<0.02	4.85	0.38
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	3.55	37.2	<0.01	37.6	0.99
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	0.18	3.44	<0.02	2.42	<0.02
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	5.75	96.0	<0.01	45.6	<0.01
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	<0.10	<0.02	<0.10	<0.02
EP231B: Perfluoroalkyl Carboxylic Acids								
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	0.1	0.8	<0.1	0.8	<0.1
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	0.26	1.57	<0.02	1.59	0.05
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	1.37	8.68	<0.02	8.25	0.26
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	0.23	1.12	<0.02	1.15	<0.02
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	0.39	2.78	<0.01	2.78	<0.01
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	2.60	<0.02	1.34	<0.02
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	<0.10	<0.02	<0.10	<0.02
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	<0.10	<0.02	<0.10	<0.02
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	<0.10	<0.02	<0.10	<0.02
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	<0.10	<0.02	<0.10	<0.02
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	<0.25	<0.05	<0.25	<0.05
EP231C: Perfluoroalkyl Sulfonamides								
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	<0.10	<0.02	<0.10	<0.02
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	<0.25	<0.05	<0.25	<0.05
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	<0.25	<0.05	<0.25	<0.05



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	0229_MW131_220303	0229_MW072_220303	0229_MW003_220303	0229_MW074_220303	0229_MW1231_220303 3
Sampling date / time					03-Mar-2022 13:10	03-Mar-2022 13:35	03-Mar-2022 13:37	03-Mar-2022 13:51	03-Mar-2022 13:52
Compound	CAS Number	LOR	Unit	ET2201359-048	ET2201359-049	ET2201359-050	ET2201359-051	ET2201359-052	
				Result	Result	Result	Result	Result	
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	<0.25	<0.05	<0.25	<0.05	
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	<0.25	<0.05	<0.25	<0.05	
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	<0.10	<0.02	<0.10	<0.02	
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	<0.10	<0.02	<0.10	<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	<0.10	<0.05	<0.10	<0.05	
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	0.08	<0.10	<0.05	<0.10	<0.05	
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	<0.10	<0.05	<0.10	<0.05	
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	<0.10	<0.05	<0.10	<0.05	
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L	13.3	165	<0.01	111	2.20	
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	9.30	133	<0.01	83.2	0.99	
Sum of PFAS (WA DER List)	----	0.01	µg/L	12.5	154	<0.01	103	1.82	
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%	104	102	91.3	100	89.2	
13C8-PFOA	----	0.02	%	100	99.1	102	101	101	



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	0229_MW123S_22030 3	0229_MW065_220303	0229_MW122_220303	0229_MW138_220303	0229_QC108_220303
Sampling date / time					03-Mar-2022 14:11	03-Mar-2022 14:24	03-Mar-2022 14:38	03-Mar-2022 14:39	03-Mar-2022 14:40
Compound	CAS Number	LOR	Unit	ET2201359-053	ET2201359-054	ET2201359-055	ET2201359-056	ET2201359-057	ET2201359-057
				Result	Result	Result	Result	Result	Result
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	0.69	0.51	0.11	0.88	0.86	
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	0.63	0.53	<0.10	0.77	0.82	
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	9.43	8.05	0.79	5.17	5.20	
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	1.20	0.34	<0.10	0.40	0.40	
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	6.97	9.00	2.20	7.09	6.99	
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	<0.02	<0.10	<0.02	<0.02	
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	0.2	0.2	<0.5	0.1	0.2	
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	0.17	0.32	<0.10	0.22	0.23	
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	0.90	1.93	<0.10	1.21	1.22	
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	0.15	0.14	<0.10	0.19	0.17	
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	0.63	0.29	<0.10	0.34	0.36	
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	<0.02	<0.10	0.04	0.04	
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	<0.02	<0.10	<0.02	<0.02	
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	<0.02	<0.10	<0.02	<0.02	
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	<0.02	<0.10	<0.02	<0.02	
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	<0.02	<0.10	<0.02	<0.02	
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.06	<0.06	<0.24	<0.05	<0.05	
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	<0.02	<0.10	<0.02	<0.02	
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.06	<0.06	<0.24	<0.05	<0.05	
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.06	<0.06	<0.24	<0.05	<0.05	



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	0229_MW123S_220303 3	0229_MW065_220303	0229_MW122_220303	0229_MW138_220303	0229_QC108_220303
Sampling date / time				03-Mar-2022 14:11	03-Mar-2022 14:24	03-Mar-2022 14:38	03-Mar-2022 14:39	03-Mar-2022 14:40	
Compound	CAS Number	LOR	Unit	ET2201359-053	ET2201359-054	ET2201359-055	ET2201359-056	ET2201359-057	
				Result	Result	Result	Result	Result	
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.06	<0.06	<0.24	<0.05	<0.05	
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.06	<0.06	<0.24	<0.05	<0.05	
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	<0.02	<0.10	<0.02	<0.02	
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	<0.02	<0.10	<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	<0.10	<0.05	<0.05	
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	<0.05	<0.10	<0.05	<0.05	
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	<0.05	<0.10	<0.05	<0.05	
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	<0.05	<0.10	<0.05	<0.05	
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L	21.0	21.3	3.10	16.4	16.5	
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	16.4	17.0	2.99	12.3	12.2	
Sum of PFAS (WA DER List)	----	0.01	µg/L	19.1	20.4	3.10	15.2	15.2	
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%	99.8	91.5	112	97.5	88.6	
13C8-PFOA	----	0.02	%	98.4	98.5	103	94.1	100	



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	0229_MW105_220303	0229_MW002_220303	0229_MW139_220303	0229_MW128_220303	0229_MW121_220303
Sampling date / time				03-Mar-2022 15:05	03-Mar-2022 14:54	03-Mar-2022 15:12	03-Mar-2022 15:17	03-Mar-2022 15:42	
Compound	CAS Number	LOR	Unit	ET2201359-058	ET2201359-059	ET2201359-060	ET2201359-061	ET2201359-062	
				Result	Result	Result	Result	Result	
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	2.72	0.08	0.10	6.68	0.04	
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	3.00	0.05	0.12	7.78	0.04	
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	20.9	0.74	1.23	82.5	0.26	
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	1.04	0.03	0.06	4.78	<0.02	
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	16.9	1.46	2.32	67.2	0.06	
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.05	<0.02	<0.02	<0.25	<0.02	
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	0.4	<0.1	<0.1	2.0	<0.1	
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	0.91	<0.02	<0.02	3.40	<0.02	
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	5.92	0.07	0.08	16.3	<0.02	
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	0.58	<0.02	<0.02	1.75	<0.02	
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	1.03	0.03	0.04	4.52	<0.01	
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	0.08	<0.02	<0.02	1.75	<0.02	
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.05	<0.02	<0.02	<0.25	<0.02	
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.05	<0.02	<0.02	<0.25	<0.02	
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.05	<0.02	<0.02	<0.25	<0.02	
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.05	<0.02	<0.02	<0.25	<0.02	
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.12	<0.05	<0.05	<0.62	<0.05	
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.05	<0.02	<0.02	<0.25	<0.02	
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.12	<0.05	<0.05	<0.62	<0.05	
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.12	<0.05	<0.05	<0.62	<0.05	



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	0229_MW105_220303	0229_MW002_220303	0229_MW139_220303	0229_MW128_220303	0229_MW121_220303
Sampling date / time				03-Mar-2022 15:05	03-Mar-2022 14:54	03-Mar-2022 15:12	03-Mar-2022 15:17	03-Mar-2022 15:42	
Compound	CAS Number	LOR	Unit	ET2201359-058	ET2201359-059	ET2201359-060	ET2201359-061	ET2201359-062	
				Result	Result	Result	Result	Result	
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.12	<0.05	<0.05	<0.62	<0.05	
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.12	<0.05	<0.05	<0.62	<0.05	
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.05	<0.02	<0.02	<0.25	<0.02	
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.05	<0.02	<0.02	<0.25	<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	<0.25	<0.05	
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	0.12	<0.05	<0.05	<0.25	<0.05	
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	<0.05	<0.05	<0.25	<0.05	
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	<0.05	<0.05	<0.25	<0.05	
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L	53.6	2.46	3.95	199	0.40	
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	37.8	2.20	3.55	150	0.32	
Sum of PFAS (WA DER List)	----	0.01	µg/L	49.5	2.38	3.77	184	0.36	
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%	84.1	85.6	91.5	91.8	90.1	
13C8-PFOA	----	0.02	%	93.8	102	99.0	103	102	



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	0229_MW102_220303	0229_QC109_220303	0229_MW120_220303	0229_QC304_220303	0229_MW101_220303
Sampling date / time				03-Mar-2022 15:52	03-Mar-2022 15:53	03-Mar-2022 16:02	03-Mar-2022 16:04	03-Mar-2022 16:11	
Compound	CAS Number	LOR	Unit	ET2201359-063	ET2201359-064	ET2201359-065	ET2201359-066	ET2201359-067	
				Result	Result	Result	Result	Result	
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	0.47	0.50	0.07	<0.02	0.41	
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	0.38	0.37	<0.02	<0.02	0.12	
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	2.27	2.21	0.07	<0.01	0.42	
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	0.17	0.16	<0.02	<0.02	<0.02	
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	1.47	1.56	0.12	<0.01	0.37	
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	0.09	0.08	<0.02	<0.02	<0.02	
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	0.37	0.37	<0.02	<0.02	0.07	
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	0.08	0.08	<0.02	<0.02	<0.02	
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	0.18	0.19	<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	



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	0229_MW102_220303	0229_QC109_220303	0229_MW120_220303	0229_QC304_220303	0229_MW101_220303
Sampling date / time				03-Mar-2022 15:52	03-Mar-2022 15:53	03-Mar-2022 16:02	03-Mar-2022 16:04	03-Mar-2022 16:11	
Compound	CAS Number	LOR	Unit	ET2201359-063	ET2201359-064	ET2201359-065	ET2201359-066	ET2201359-067	
				Result	Result	Result	Result	Result	
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05	
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05	
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02	
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02	
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05	
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05	
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05	
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05	
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L	5.48	5.52	0.26	<0.01	1.41	
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	3.74	3.77	0.19	<0.01	0.79	
Sum of PFAS (WA DER List)	----	0.01	µg/L	4.93	4.99	0.26	<0.01	1.29	
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%	85.9	91.6	92.1	87.2	87.3	
13C8-PFOA	----	0.02	%	103	99.4	98.5	107	99.1	



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	0229_QC305_220303	0229_SW217_220302	0229_SW233_220302	0229_QC104_220302	0229_SW242_220302
Sampling date / time				03-Mar-2022 16:17	02-Mar-2022 13:00	02-Mar-2022 12:38	02-Mar-2022 12:00	02-Mar-2022 13:50	
Compound	CAS Number	LOR	Unit	ET2201359-068	ET2201359-069	ET2201359-070	ET2201359-071	ET2201359-072	
				Result	Result	Result	Result	Result	
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	<0.02	0.06	0.05	<0.02	
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	<0.02	0.03	0.02	<0.02	
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	<0.01	0.27	0.21	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	<0.01	0.01	0.47	0.26	0.08	
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	0.05	0.03	<0.02	
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02	
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	<0.01	0.02	0.01	<0.01	
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02	
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02	
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02	
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02	
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02	
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05	
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02	
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05	
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05	



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	0229_QC305_220303	0229_SW217_220302	0229_SW233_220302	0229_QC104_220302	0229_SW242_220302
Sampling date / time				03-Mar-2022 16:17	02-Mar-2022 13:00	02-Mar-2022 12:38	02-Mar-2022 12:00	02-Mar-2022 13:50	
Compound	CAS Number	LOR	Unit	ET2201359-068	ET2201359-069	ET2201359-070	ET2201359-071	ET2201359-072	
				Result	Result	Result	Result	Result	
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05	
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05	
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02	
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02	
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05	
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05	
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05	
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05	
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L	<0.01	0.01	0.90	0.58	0.13	
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	<0.01	0.01	0.74	0.47	0.13	
Sum of PFAS (WA DER List)	----	0.01	µg/L	<0.01	0.01	0.87	0.56	0.13	
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%	89.0	88.8	91.7	91.8	88.3	
13C8-PFOA	----	0.02	%	96.6	98.8	101	95.5	100	



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	0229_SW136_220302	0229_SW243_220302	0229_SW232_220302	0229_SW205_220302	0229_QC302_220302
Sampling date / time				02-Mar-2022 09:00	02-Mar-2022 14:08	02-Mar-2022 14:34	02-Mar-2022 11:30	02-Mar-2022 15:10	
Compound	CAS Number	LOR	Unit	ET2201359-073	ET2201359-074	ET2201359-075	ET2201359-076	ET2201359-077	
				Result	Result	Result	Result	Result	
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	0.03	<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	0.10	<0.01	0.05	0.01	<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	0.25	<0.01	0.04	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	
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	<0.02	
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	



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	0229_SW136_220302	0229_SW243_220302	0229_SW232_220302	0229_SW205_220302	0229_QC302_220302
Sampling date / time				02-Mar-2022 09:00	02-Mar-2022 14:08	02-Mar-2022 14:34	02-Mar-2022 11:30	02-Mar-2022 15:10	
Compound	CAS Number	LOR	Unit	ET2201359-073	ET2201359-074	ET2201359-075	ET2201359-076	ET2201359-077	
				Result	Result	Result	Result	Result	
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05	
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05	
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02	
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02	
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05	
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05	
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05	
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05	
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L	0.40	<0.01	0.09	0.02	<0.02	
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	0.35	<0.01	0.09	0.02	<0.02	
Sum of PFAS (WA DER List)	----	0.01	µg/L	0.40	<0.01	0.09	0.02	<0.02	
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%	96.0	89.7	99.9	87.2	85.6	
13C8-PFOA	----	0.02	%	93.9	99.2	96.8	99.5	102	



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	0229_SW203_220302	0229_SW220_220302	0229_QC306_220304	0229_MW236S_220304	0229_MW115_220304
Sampling date / time					02-Mar-2022 12:00	02-Mar-2022 13:25	04-Mar-2022 13:00	04-Mar-2022 09:55	04-Mar-2022 11:05
Compound	CAS Number	LOR	Unit	ET2201359-078	ET2201359-079	ET2201359-093	ET2201359-094	ET2201359-095	ET2201359-095
				Result	Result	Result	Result	Result	Result
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	0.06	0.14	<0.02	0.06	0.15	
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	0.02	0.11	<0.02	0.02	0.09	
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	0.23	1.05	<0.01	0.24	0.36	
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	0.30	0.91	<0.01	0.25	0.20	
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	0.03	0.19	<0.02	<0.02	0.14	
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	0.04	<0.01	0.01	<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	<0.02	<0.02	<0.02	<0.02	<0.02	
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05	
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05	



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	0229_SW203_220302	0229_SW220_220302	0229_QC306_220304	0229_MW236S_22030 4	0229_MW115_220304
Sampling date / time					02-Mar-2022 12:00	02-Mar-2022 13:25	04-Mar-2022 13:00	04-Mar-2022 09:55	04-Mar-2022 11:05
Compound	CAS Number	LOR	Unit	ET2201359-078	ET2201359-079	ET2201359-093	ET2201359-094	ET2201359-095	
				Result	Result	Result	Result	Result	
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05	
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05	
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02	
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02	
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05	
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05	
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05	
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05	
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L	0.65	2.53	<0.01	0.58	0.94	
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	0.53	1.96	<0.01	0.49	0.56	
Sum of PFAS (WA DER List)	----	0.01	µg/L	0.63	2.35	<0.01	0.56	0.85	
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%	101	94.0	95.2	88.3	96.8	
13C8-PFOA	----	0.02	%	102	101	98.7	101	101	



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	0229_MW116_220304	0229_MW135_220304	0229_MW114_220304	0229_MW018_220304	0229_QC500_220304
Sampling date / time				04-Mar-2022 10:55	04-Mar-2022 10:30	04-Mar-2022 11:32	04-Mar-2022 12:10	04-Mar-2022 14:13	
Compound	CAS Number	LOR	Unit	ET2201359-096	ET2201359-097	ET2201359-098	ET2201359-099	ET2201359-100	
				Result	Result	Result	Result	Result	
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	0.11	0.11	1.38	3.68	<0.02	
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	0.04	0.10	1.34	3.98	<0.02	
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	0.11	1.04	6.90	26.5	<0.01	
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.09	0.42	1.78	<0.02	
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	0.02	1.78	0.91	47.9	<0.01	
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	<0.02	<0.02	<0.05	<0.02	
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	<0.1	0.3	0.4	<0.1	
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	<0.02	0.44	0.92	<0.02	
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	0.04	0.08	2.71	6.86	<0.02	
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	<0.02	0.45	0.73	<0.02	
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	0.05	0.67	1.88	<0.01	
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	<0.02	<0.02	<0.05	<0.02	
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	<0.02	<0.02	<0.05	<0.02	
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	<0.02	<0.02	<0.05	<0.02	
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	<0.02	<0.02	<0.05	<0.02	
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	<0.02	<0.02	<0.05	<0.02	
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	<0.05	<0.05	<0.12	<0.05	
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	<0.02	<0.02	<0.05	<0.02	
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	<0.05	<0.05	<0.12	<0.05	
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	<0.05	<0.05	<0.12	<0.05	



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	0229_MW116_220304	0229_MW135_220304	0229_MW114_220304	0229_MW018_220304	0229_QC500_220304
Sampling date / time				04-Mar-2022 10:55	04-Mar-2022 10:30	04-Mar-2022 11:32	04-Mar-2022 12:10	04-Mar-2022 14:13	
Compound	CAS Number	LOR	Unit	ET2201359-096	ET2201359-097	ET2201359-098	ET2201359-099	ET2201359-100	
				Result	Result	Result	Result	Result	
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	<0.05	<0.05	<0.12	<0.05	
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	<0.05	<0.05	<0.12	<0.05	
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	<0.02	<0.02	<0.05	<0.02	
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	<0.02	<0.02	<0.05	<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	0.32	3.25	15.5	94.6	<0.01	
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	0.13	2.82	7.81	74.4	<0.01	
Sum of PFAS (WA DER List)	----	0.01	µg/L	0.28	3.06	13.8	88.9	<0.01	
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%	91.0	90.3	88.4	96.4	103	
13C8-PFOA	----	0.02	%	102	96.8	103	98.2	101	



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)		Sample ID		0229_MW141_220303	----	----	----	----
		Sampling date / time		03-Mar-2022 14:05	----	----	----	----
Compound	CAS Number	LOR	Unit	ET2201359-101	-----	-----	-----	-----
				Result	----	----	----	----
EP231A: Perfluoroalkyl Sulfonic Acids								
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	0.17	----	----	----	----
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	0.14	----	----	----	----
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	1.06	----	----	----	----
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	0.05	----	----	----	----
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	0.51	----	----	----	----
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	0.05	----	----	----	----
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	0.28	----	----	----	----
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	0.02	----	----	----	----
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	0.05	----	----	----	----
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	----	----	----	----



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)		Sample ID	0229_MW141_220303	----	----	----	----
		Sampling date / time	03-Mar-2022 14:05	----	----	----	----
Compound	CAS Number	LOR	Unit	ET2201359-101	-----	-----	-----
				Result	----	----	----
EP231C: Perfluoroalkyl Sulfonamides - Continued							
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	2.33	----	----	----
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	1.57	----	----	----
Sum of PFAS (WA DER List)	----	0.01	µg/L	2.14	----	----	----
EP231S: PFAS Surrogate							
13C4-PFOS	----	0.02	%	97.0	----	----	----
13C8-PFOA	----	0.02	%	101	----	----	----



Surrogate Control Limits

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

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

Inter-Laboratory Testing

Analysis conducted by ALS Brisbane, NATA accreditation no. 825, site no. 818 (Chemistry) 18958 (Biology).

- (SOIL) EP231C: Perfluoroalkyl Sulfonamides
- (SOIL) EP231A: Perfluoroalkyl Sulfonic Acids
- (SOIL) EP231B: Perfluoroalkyl Carboxylic Acids
- (SOIL) EP231D: (n:2) Fluorotelomer Sulfonic Acids
- (SOIL) EP231P: PFAS Sums
- (SOIL) EP231S: PFAS Surrogate
- (SOIL) EA055: Moisture Content (Dried @ 105-110°C)
- (WATER) EP231A: Perfluoroalkyl Sulfonic Acids
- (WATER) EP231B: Perfluoroalkyl Carboxylic Acids
- (WATER) EP231C: Perfluoroalkyl Sulfonamides
- (WATER) EP231D: (n:2) Fluorotelomer Sulfonic Acids
- (WATER) EP231P: PFAS Sums
- (WATER) EP231S: PFAS Surrogate



QUALITY CONTROL REPORT

Work Order : ET2201359
Client : AECOM AUSTRALIA PTY LTD
Contact :
Address : PO BOX 1307 FORTITUDE VALLEY QLD, AUSTRALIA 4006
Telephone :
Project : QLD_0229_PFASOMP_20
Order number : 60612487_3.1
C-O-C number : 34488
Sampler :
Site : QLD_0229
Quote number : TV/007/21 v2 - Compass
No. of samples received : 101
No. of samples analysed : 100

Page : 1 of 25
Laboratory : Environmental Division Townsville
Contact :
Address : 13 Carlton Street, Kirwan Townsville QLD Australia 4815
Telephone :
Date Samples Received : 08-Mar-2022
Date Analysis Commenced : 08-Mar-2022
Issue Date : 18-Mar-2022



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.

Table with 3 columns: Signatories, Position, Accreditation Category. Includes entries for Senior Inorganic Chemist and 2IC Organic Chemist at Brisbane Inorganics and Organics, Stafford, QLD.



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: 4214938)									
ET2201359-002	0229_SD140_220301	EA055: Moisture Content	----	0.1	%	30.4	30.9	1.5	0% - 20%
ET2201359-021	0229_SD133_220301	EA055: Moisture Content	----	0.1	%	1.5	1.7	14.7	0% - 50%
EA055: Moisture Content (Dried @ 105-110°C) (QC Lot: 4214940)									
ET2201359-084	0229_QC105_220302	EA055: Moisture Content	----	0.1	%	21.2	21.4	1.1	0% - 20%
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 4214937)									
ET2201359-002	0229_SD140_220301	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	0.0012	0.0008	45.1	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	0.0167	# 0.0128	26.0	0% - 20%
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	0.0005	0.0004	0.0	No Limit
ET2201359-021	0229_SD133_220301	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	0.0006	0.0006	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: 4214939)									
ET2201359-084	0229_QC105_220302	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



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: 4214939) - continued											
ET2201359-084	0229_QC105_220302	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: 4214937)											
ET2201359-002	0229_SD140_220301	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		
		ET2201359-021	0229_SD133_220301	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: 4214939)											
ET2201359-084	0229_QC105_220302			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: 4214937)									
		ET2201359-002	0229_SD140_220301	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		



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: 4214937) - continued									
ET2201359-002	0229_SD140_220301	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
ET2201359-021	0229_SD133_220301	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
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 4214939)									
ET2201359-084	0229_QC105_220302	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: 4214937)									
ET2201359-002	0229_SD140_220301	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: 4214937) - continued									
ET2201359-002	0229_SD140_220301	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
ET2201359-021	0229_SD133_220301	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: 4214939)									
ET2201359-084	0229_QC105_220302	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: 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: 4217836)									
ET2201359-020	0229_SW121_220301	EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	0.46	0.52	11.7	0% - 20%
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	0.36	0.36	0.0	0% - 20%
		EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	0.12	0.12	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	0.07	0.08	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: 4217837)									
ET2201359-035	0229_SW227_220228	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
ET2201359-048	0229_MW131_220303	EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	3.55	3.63	2.2	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 (%)
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 4217837) - continued									
ET2201359-048	0229_MW131_220303	EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	5.75	6.42	10.9	0% - 20%
		EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	0.74	0.75	2.0	0% - 20%
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	0.64	0.67	4.8	0% - 20%
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	0.18	0.20	12.9	0% - 50%
		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: 4217838)									
ET2201359-067	0229_MW101_220303	EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	0.42	0.47	12.0	0% - 20%
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	0.37	0.36	0.0	0% - 20%
		EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	0.41	0.40	0.0	0% - 20%
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	0.12	0.13	11.9	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: 4217839)									
ET2201359-094	0229_MW236S_220304	EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	0.24	0.25	4.9	0% - 20%
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	0.25	0.28	13.1	0% - 20%
		EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	0.06	0.06	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	0.02	0.03	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
ET2201359-099	0229_MW018_220304	EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	26.5	28.9	8.6	0% - 20%
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	47.9	58.0	19.1	0% - 20%
		EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	3.68	3.68	0.0	0% - 20%
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	3.98	4.52	12.6	0% - 20%
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	1.78	2.00	11.4	0% - 20%
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.05	<0.05	0.0	No Limit
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 4217836)									
ET2201359-020	0229_SW121_220301	EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	0.03	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	0.13	0.13	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: 4217837)							
ET2201359-035	0229_SW227_220228	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: 4217837) - continued									
ET2201359-035	0229_SW227_220228	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
ET2201359-048	0229_MW131_220303	EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	0.39	0.37	4.0	0% - 20%
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	0.26	0.26	0.0	0% - 50%
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	1.37	1.34	2.2	0% - 20%
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	0.23	0.23	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	0.1	0.1	0.0	No Limit		
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 4217838)									
ET2201359-067	0229_MW101_220303	EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	0.02	0.02	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: 4217839)									
ET2201359-094	0229_MW236S_220304	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: 4217839) - continued									
ET2201359-094	0229_MW236S_220304	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
ET2201359-099	0229_MW018_220304	EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	1.88	1.99	5.4	0% - 20%
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	0.92	0.98	6.3	0% - 50%
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	6.86	6.79	1.1	0% - 20%
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	0.73	0.74	0.0	0% - 50%
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.12	<0.12	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	0.4	0.5	0.0	No Limit
		EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 4217836)							
ET2201359-020	0229_SW121_220301	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: 4217837)									
ET2201359-035	0229_SW227_220228	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: 4217837) - continued									
ET2201359-035	0229_SW227_220228	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
ET2201359-048	0229_MW131_220303	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: 4217838)									
ET2201359-067	0229_MW101_220303	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: 4217839)									
ET2201359-094	0229_MW236S_220304	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: 4217839) - continued									
ET2201359-094	0229_MW236S_220304	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
ET2201359-099	0229_MW018_220304	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.12	<0.12	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.12	<0.12	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.12	<0.12	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.12	<0.12	0.0	No Limit
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 4217836)									
ET2201359-020	0229_SW121_220301	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: 4217837)									
ET2201359-035	0229_SW227_220228	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
ET2201359-048	0229_MW131_220303	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	0.08	0.07	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: 4217837) - continued									
ET2201359-048	0229_MW131_220303	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: 4217838)									
ET2201359-067	0229_MW101_220303	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: 4217839)									
ET2201359-094	0229_MW236S_220304	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
ET2201359-099	0229_MW018_220304	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: 4217836)									
ET2201359-020	0229_SW121_220301	EP231X: Sum of PFAS	----	0.01	µg/L	1.20	1.27	5.7	0% - 20%
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	0.82	0.88	7.1	0% - 20%
		EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	1.13	1.19	5.2	0% - 20%
EP231P: PFAS Sums (QC Lot: 4217837)									
ET2201359-035	0229_SW227_220228	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
ET2201359-048	0229_MW131_220303	EP231X: Sum of PFAS	----	0.01	µg/L	13.3	14.0	5.5	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 (%)
EP231P: PFAS Sums (QC Lot: 4217837) - continued									
ET2201359-048	0229_MW131_220303	EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	9.30	10.0	7.8	0% - 20%
		EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	12.5	13.2	5.5	0% - 20%
EP231P: PFAS Sums (QC Lot: 4217838)									
ET2201359-067	0229_MW101_220303	EP231X: Sum of PFAS	----	0.01	µg/L	1.41	1.45	2.8	0% - 20%
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	0.79	0.83	4.9	0% - 20%
		EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	1.29	1.32	2.3	0% - 20%
EP231P: PFAS Sums (QC Lot: 4217839)									
ET2201359-094	0229_MW236S_220304	EP231X: Sum of PFAS	----	0.01	µg/L	0.58	0.63	8.3	0% - 20%
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	0.49	0.53	7.8	0% - 20%
		EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	0.56	0.60	6.9	0% - 20%
ET2201359-099	0229_MW018_220304	EP231X: Sum of PFAS	----	0.01	µg/L	94.6	108	13.3	0% - 20%
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	74.4	86.9	15.5	0% - 20%
		EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	88.9	102	13.3	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: **SOIL**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report				
				Result	Spike Concentration	Spike Recovery (%)		Acceptable Limits (%)	
						LCS	Low	High	
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4214937)									
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	0.0011 mg/kg	87.3	72.0	128	
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	0.00117 mg/kg	73.5	73.0	123	
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	0.00118 mg/kg	77.5	67.0	130	
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	0.00119 mg/kg	79.0	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	77.9	59.0	134	
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4214939)									
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	0.0011 mg/kg	91.4	72.0	128	
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	0.00117 mg/kg	90.6	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	96.2	70.0	132	
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	0.00116 mg/kg	99.1	68.0	136	
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	0.0012 mg/kg	92.9	59.0	134	
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4214937)									
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	0.00625 mg/kg	94.6	71.0	135	
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	0.00125 mg/kg	80.4	69.0	132	
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	0.00125 mg/kg	94.8	70.0	132	
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	0.00125 mg/kg	84.0	71.0	131	
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	93.2	69.0	133	
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	75.6	72.0	129	
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	0.00125 mg/kg	85.6	69.0	133	
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	76.8	64.0	136	
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	82.8	69.0	135	
EP231X: Perfluorotridecanoic acid (PFTTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	82.8	66.0	139	
EP231X: Perfluorotetradecanoic acid (PFTTeDA)	376-06-7	0.0005	mg/kg	<0.0005	0.00312 mg/kg	101	69.0	133	
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4214939)									
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	0.00625 mg/kg	99.4	71.0	135	
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	0.00125 mg/kg	84.4	69.0	132	
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	0.00125 mg/kg	78.8	70.0	132	
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	0.00125 mg/kg	85.6	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	86.8	72.0	129	
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	0.00125 mg/kg	73.6	69.0	133	
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	84.8	64.0	136	



Sub-Matrix: **SOIL**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report Result	Laboratory Control Spike (LCS) Report				
					Spike Concentration	Spike Recovery (%)		Acceptable Limits (%)	
						LCS	Low	High	
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4214939) - continued									
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	79.6	69.0	135	
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	78.8	66.0	139	
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	0.00312 mg/kg	97.6	69.0	133	
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4214937)									
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	0.00125 mg/kg	95.2	67.0	137	
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	0.00312 mg/kg	85.2	59.6	143	
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	0.00312 mg/kg	88.9	62.8	140	
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	0.00312 mg/kg	89.6	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	137	
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	0.00125 mg/kg	88.4	63.0	144	
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	0.00125 mg/kg	95.6	61.0	139	
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4214939)									
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	0.00125 mg/kg	94.8	67.0	137	
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	0.00312 mg/kg	95.4	59.6	143	
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	0.00312 mg/kg	79.5	62.8	140	
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	0.00312 mg/kg	88.3	61.5	139	
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	0.00312 mg/kg	97.4	61.9	137	
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	0.00125 mg/kg	82.8	63.0	144	
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	0.00125 mg/kg	77.2	61.0	139	
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4214937)									
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	0.00117 mg/kg	85.0	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	83.5	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	87.5	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	79.2	54.8	124	
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4214939)									
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	0.00117 mg/kg	79.0	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	88.6	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	76.2	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	78.8	54.8	124	

Sub-Matrix: **WATER**

Method Blank (MB) Report	Laboratory Control Spike (LCS) Report		
	Spike	Spike Recovery (%)	Acceptable Limits (%)



Sub-Matrix: WATER

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB)	Laboratory Control Spike (LCS) Report				
				Report	Spike Concentration	Spike Recovery (%)		Acceptable Limits (%)	
				Result		LCS	Low	High	
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4217836)									
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.2218 µg/L	77.5	72.0	130	
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.2352 µg/L	85.4	71.0	127	
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	0.2373 µg/L	76.7	68.0	131	
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.238 µg/L	82.1	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	96.9	53.0	142	
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4217837)									
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	80.1	71.0	127	
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	0.2373 µg/L	89.1	68.0	131	
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.238 µg/L	82.1	69.0	134	
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.232 µg/L	85.3	65.0	140	
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.241 µg/L	81.3	53.0	142	
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4217838)									
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.2218 µg/L	99.0	72.0	130	
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.2352 µg/L	95.4	71.0	127	
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	0.2373 µg/L	94.4	68.0	131	
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.238 µg/L	96.2	69.0	134	
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.232 µg/L	98.7	65.0	140	
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.241 µg/L	90.4	53.0	142	
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4217839)									
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.2218 µg/L	99.9	72.0	130	
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.2352 µg/L	94.2	71.0	127	
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	0.2373 µg/L	86.2	68.0	131	
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.238 µg/L	98.9	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	96.9	53.0	142	
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4217836)									
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	1.25 µg/L	75.5	73.0	129	
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	0.25 µg/L	81.4	72.0	129	
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	0.25 µg/L	82.6	72.0	129	
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	0.25 µg/L	80.6	72.0	130	
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	0.25 µg/L	84.0	71.0	133	
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	0.25 µg/L	77.4	69.0	130	
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	0.25 µg/L	80.2	71.0	129	
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	0.25 µg/L	85.2	69.0	133	
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	0.25 µg/L	86.2	72.0	134	
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	0.25 µg/L	83.6	65.0	144	



Sub-Matrix: WATER

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report				
				Result	Spike Concentration	Spike Recovery (%)		Acceptable Limits (%)	
						LCS	Low	High	
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4217836) - continued									
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	0.625 µg/L	89.6	71.0	132	
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4217837)									
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	1.25 µg/L	80.4	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	82.2	72.0	129	
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	0.25 µg/L	79.8	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	72.6	69.0	130	
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	0.25 µg/L	74.0	71.0	129	
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	0.25 µg/L	82.8	69.0	133	
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	0.25 µg/L	81.4	72.0	134	
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	0.25 µg/L	83.8	65.0	144	
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	0.625 µg/L	85.8	71.0	132	
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4217838)									
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	1.25 µg/L	88.6	73.0	129	
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	0.25 µg/L	83.2	72.0	129	
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	0.25 µg/L	96.0	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	96.2	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	92.8	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	98.0	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	0.625 µg/L	97.8	71.0	132	
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4217839)									
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	88.0	72.0	129	
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	0.25 µg/L	91.2	72.0	129	
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	0.25 µg/L	92.6	72.0	130	
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	0.25 µg/L	97.2	71.0	133	
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	0.25 µg/L	83.4	69.0	130	
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	0.25 µg/L	90.8	71.0	129	
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	0.25 µg/L	98.4	69.0	133	
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	0.25 µg/L	104	72.0	134	
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	0.25 µg/L	101	65.0	144	
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	0.625 µg/L	106	71.0	132	
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4217836)									



Sub-Matrix: WATER

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report				
				Result	Spike Concentration	Spike Recovery (%)		Acceptable Limits (%)	
						LCS	Low	High	
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4217836) - continued									
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.25 µg/L	85.6	67.0	137	
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	0.625 µg/L	93.7	68.0	141	
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	0.625 µg/L	97.6	60.5	138	
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	0.625 µg/L	89.4	68.3	134	
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	0.625 µg/L	81.5	62.6	138	
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	0.25 µg/L	94.0	65.0	136	
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	0.25 µg/L	81.6	61.0	135	
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4217837)									
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	89.0	68.0	141	
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	0.625 µg/L	87.2	60.5	138	
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	0.625 µg/L	82.7	68.3	134	
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	0.625 µg/L	83.2	62.6	138	
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	0.25 µg/L	85.0	65.0	136	
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	0.25 µg/L	80.2	61.0	135	
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4217838)									
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.25 µg/L	92.2	67.0	137	
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	0.625 µg/L	124	68.0	141	
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	0.625 µg/L	86.7	60.5	138	
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	0.625 µg/L	91.8	68.3	134	
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	0.625 µg/L	96.3	62.6	138	
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	0.25 µg/L	89.0	65.0	136	
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	0.25 µg/L	91.8	61.0	135	
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4217839)									
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.25 µg/L	99.2	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	90.2	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 (%)		Acceptable Limits (%)	
						LCS	Low	High	High
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4217839) - continued									
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	106	62.6	138	
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	0.25 µg/L	115	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: 4217836)									
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.2343 µg/L	85.8	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	83.0	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	103	64.2	133	
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4217837)									
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.2343 µg/L	80.7	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	92.3	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	71.2	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	88.6	64.2	133	
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4217838)									
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	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	98.3	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	101	64.2	133	
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4217839)									
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	95.4	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	98.1	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	101	64.2	133	
EP231P: PFAS Sums (QCLot: 4217836)									
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: 4217837)									
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	Spike Recovery (%)	Acceptable Limits (%)	
						LCS	Low	High
EP231P: PFAS Sums (QCLot: 4217838)								
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: 4217839)								
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: **SOIL**

Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report			
				Spike Concentration	Spike Recovery (%) MS	Acceptable Limits (%)	
					Low	High	
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4214937)							
ET2201359-004	0229_SD109_220301	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0011 mg/kg	107	72.0	128
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.00117 mg/kg	96.5	73.0	123
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.00118 mg/kg	# Not Determined	67.0	130
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.00119 mg/kg	122	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	108	59.0	134
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4214939)							
ET2201359-085	0229_SD205_220302	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	94.0	73.0	123
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.00118 mg/kg	110	67.0	130
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.00119 mg/kg	97.5	70.0	132
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.00116 mg/kg	87.5	68.0	136
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0012 mg/kg	86.2	59.0	134
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4214937)							
ET2201359-004	0229_SD109_220301	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.00625 mg/kg	104	71.0	135
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.00125 mg/kg	72.2	69.0	132
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.00125 mg/kg	# Not Determined	70.0	132



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: 4214937) - continued							
ET2201359-004	0229_SD109_220301	EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.00125 mg/kg	96.1	71.0	131
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.00125 mg/kg	# Not Determined	69.0	133
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.00125 mg/kg	80.0	72.0	129
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.00125 mg/kg	72.0	69.0	133
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.00125 mg/kg	82.0	64.0	136
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.00125 mg/kg	82.0	69.0	135
		EP231X: Perfluorotridecanoic acid (PFTTrDA)	72629-94-8	0.00125 mg/kg	100	66.0	139
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.00312 mg/kg	96.2	69.0	133
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4214939)							
ET2201359-085	0229_SD205_220302	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.00625 mg/kg	95.8	71.0	135
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.00125 mg/kg	94.0	69.0	132
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.00125 mg/kg	75.2	70.0	132
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.00125 mg/kg	85.2	71.0	131
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.00125 mg/kg	110	69.0	133
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.00125 mg/kg	88.0	72.0	129
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.00125 mg/kg	70.8	69.0	133
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.00125 mg/kg	82.8	64.0	136
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.00125 mg/kg	82.8	69.0	135
		EP231X: Perfluorotridecanoic acid (PFTTrDA)	72629-94-8	0.00125 mg/kg	84.0	66.0	139
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.00312 mg/kg	86.7	69.0	133
		EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4214937)					
ET2201359-004	0229_SD109_220301	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.00125 mg/kg	# Not Determined	48.0	128
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.00312 mg/kg	84.9	70.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.00312 mg/kg	81.7	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.00312 mg/kg	85.7	70.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.00312 mg/kg	95.3	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.00125 mg/kg	84.0	63.0	144
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.00125 mg/kg	92.0	61.0	139
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4214939)							
ET2201359-085	0229_SD205_220302	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.00125 mg/kg	103	48.0	128
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.00312 mg/kg	102	70.0	130



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: 4214939) - continued							
ET2201359-085	0229_SD205_220302	EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.00312 mg/kg	91.8	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.00312 mg/kg	99.0	70.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.00312 mg/kg	103	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.00125 mg/kg	77.6	63.0	144
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.00125 mg/kg	78.4	61.0	139
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4214937)							
ET2201359-004	0229_SD109_220301	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.00117 mg/kg	81.2	62.0	145
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.00118 mg/kg	99.6	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0012 mg/kg	81.2	65.0	137
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0012 mg/kg	79.2	70.0	130
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4214939)							
ET2201359-085	0229_SD205_220302	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.00117 mg/kg	77.4	62.0	145
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.00118 mg/kg	97.9	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0012 mg/kg	77.5	65.0	137
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0012 mg/kg	120	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
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4217836)							
ET2201359-027	0229_MW124_220302	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.2218 µg/L	98.7	72.0	130
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.235 µg/L	103	71.0	127
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.2352 µg/L	91.8	68.0	131
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.238 µg/L	96.7	69.0	134
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.232 µg/L	97.6	65.0	140
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.241 µg/L	121	53.0	142
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4217837)							
ET2201359-037	0229_MW233_220303	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.2218 µg/L	84.5	72.0	130
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.235 µg/L	77.2	71.0	127
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.2352 µg/L	84.6	68.0	131
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.238 µg/L	82.3	69.0	134
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.232 µg/L	86.6	65.0	140
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.241 µg/L	85.5	53.0	142
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4217838)							



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: 4217838) - continued							
ET2201359-069	0229_SW217_220302	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.2218 µg/L	91.6	72.0	130
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.235 µg/L	83.8	71.0	127
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.2352 µg/L	80.0	68.0	131
		EP231X: Perfluoroheptane sulfonic acid (PFHps)	375-92-8	0.238 µg/L	87.2	69.0	134
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.232 µg/L	93.8	65.0	140
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.241 µg/L	91.1	53.0	142
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4217839)							
ET2201359-076	0229_SW205_220302	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.2218 µg/L	104	72.0	130
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.235 µg/L	95.1	71.0	127
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.2352 µg/L	88.9	68.0	131
		EP231X: Perfluoroheptane sulfonic acid (PFHps)	375-92-8	0.238 µg/L	98.9	69.0	134
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.232 µg/L	108	65.0	140
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.241 µg/L	107	53.0	142
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4217836)							
ET2201359-027	0229_MW124_220302	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	1.25 µg/L	82.3	73.0	129
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.25 µg/L	99.6	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	95.4	72.0	130
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.25 µg/L	105	71.0	133
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.25 µg/L	91.0	69.0	130
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.25 µg/L	95.2	71.0	129
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.25 µg/L	101	69.0	133
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.25 µg/L	105	72.0	134
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.25 µg/L	102	65.0	144
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.625 µg/L	112	71.0	132
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4217837)							
ET2201359-037	0229_MW233_220303	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	1.25 µg/L	83.0	73.0	129
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.25 µg/L	79.6	72.0	129
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.25 µg/L	82.4	72.0	129
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.25 µg/L	77.0	72.0	130
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.25 µg/L	96.0	71.0	133
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.25 µg/L	79.0	69.0	130
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.25 µg/L	77.6	71.0	129
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.25 µg/L	78.4	69.0	133
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.25 µg/L	81.0	72.0	134
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.25 µg/L	80.6	65.0	144
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.625 µg/L	88.3	71.0	132
		EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4217838)					



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: 4217838) - continued							
ET2201359-069	0229_SW217_220302	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	1.25 µg/L	76.8	73.0	129
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.25 µg/L	75.2	72.0	129
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.25 µg/L	93.6	72.0	129
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.25 µg/L	97.4	72.0	130
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.25 µg/L	98.0	71.0	133
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.25 µg/L	93.2	69.0	130
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.25 µg/L	99.8	71.0	129
		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	107	72.0	134
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.25 µg/L	99.6	65.0	144
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.625 µg/L	105	71.0	132
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4217839)							
ET2201359-076	0229_SW205_220302	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	1.25 µg/L	86.4	73.0	129
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.25 µg/L	91.2	72.0	129
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.25 µg/L	100	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	100	71.0	133
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.25 µg/L	93.2	69.0	130
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.25 µg/L	97.6	71.0	129
		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	113	72.0	134
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.25 µg/L	107	65.0	144
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.625 µg/L	109	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4217836)							
ET2201359-027	0229_MW124_220302	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.25 µg/L	98.8	59.0	135
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.625 µg/L	115	70.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.625 µg/L	104	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.625 µg/L	104	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	113	65.0	136
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.25 µg/L	97.4	61.0	135
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4217837)							
ET2201359-037	0229_MW233_220303	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.25 µg/L	87.6	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: 4217837) - continued							
ET2201359-037	0229_MW233_220303	EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.625 µg/L	84.0	70.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.625 µg/L	83.1	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.625 µg/L	88.4	70.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.625 µg/L	85.0	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.25 µg/L	85.0	65.0	136
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.25 µg/L	86.6	61.0	135
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4217838)							
ET2201359-069	0229_SW217_220302	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.25 µg/L	79.2	59.0	135
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.625 µg/L	116	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	91.7	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	100	65.0	136
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.25 µg/L	106	61.0	135
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4217839)							
ET2201359-076	0229_SW205_220302	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.25 µg/L	93.2	59.0	135
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.625 µg/L	113	70.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.625 µg/L	98.7	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	109	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.25 µg/L	116	65.0	136
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.25 µg/L	120	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4217836)							
ET2201359-027	0229_MW124_220302	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.234 µg/L	100	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: 4217836) - continued							
ET2201359-027	0229_MW124_220302	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	98.3	67.0	138
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.2415 µg/L	122	70.0	130
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4217837)							
ET2201359-037	0229_MW233_220303	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.234 µg/L	80.1	63.0	143
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.2378 µg/L	93.6	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.24 µg/L	80.6	67.0	138
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.2415 µg/L	120	70.0	130
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4217838)							
ET2201359-069	0229_SW217_220302	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.234 µg/L	105	63.0	143
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.2378 µg/L	90.8	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	72.0	70.0	130
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4217839)							
ET2201359-076	0229_SW205_220302	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	101	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	92.6	70.0	130

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: ET2201359	Page	: 1 of 12
Client	: AECOM AUSTRALIA PTY LTD	Laboratory	: Environmental Division Townsville
Contact	: [REDACTED]	Telephone	: [REDACTED]
Project	: QLD_0229_PFASOMP_20	Date Samples Received	: 08-Mar-2022
Site	: QLD_0229	Issue Date	: 18-Mar-2022
Sampler	: [REDACTED]	No. of samples received	: 101
Order number	: 60612487_3.1	No. of samples analysed	: 100

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: **SOIL**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
Duplicate (DUP) RPDs							
EP231A: Perfluoroalkyl Sulfonic Acids	ET2201359--002	0229_SD140_220301	Perfluorooctane sulfonic acid (PFOS)	1763-23-1	26.0 %	0% - 20%	RPD exceeds LOR based limits
Matrix Spike (MS) Recoveries							
EP231A: Perfluoroalkyl Sulfonic Acids	ET2201359--004	0229_SD109_220301	Perfluorohexane sulfonic acid (PFHxS)	355-46-4	Not Determined	----	MS recovery not determined, background level greater than or equal to 4x spike level.
EP231A: Perfluoroalkyl Sulfonic Acids	ET2201359--004	0229_SD109_220301	Perfluorooctane sulfonic acid (PFOS)	1763-23-1	Not Determined	----	MS recovery not determined, background level greater than or equal to 4x spike level.
EP231B: Perfluoroalkyl Carboxylic Acids	ET2201359--004	0229_SD109_220301	Perfluorohexanoic acid (PFHxA)	307-24-4	Not Determined	----	MS recovery not determined, background level greater than or equal to 4x spike level.
EP231B: Perfluoroalkyl Carboxylic Acids	ET2201359--004	0229_SD109_220301	Perfluorooctanoic acid (PFOA)	335-67-1	Not Determined	----	MS recovery not determined, background level greater than or equal to 4x spike level.
EP231C: Perfluoroalkyl Sulfonamides	ET2201359--004	0229_SD109_220301	Perfluorooctane sulfonamide (FOSA)	754-91-6	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
	QC	Regular	Actual	Expected	
Laboratory Duplicates (DUP)					
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	6	71	8.45	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: **SOIL**

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

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



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) 0229_SD140_220301, 0229_SD110_220301, 0229_SD139_220301, 0229_SD113_220301, 0229_SD120_220301, 0229_SD133_220301,	0229_SD109_220301, 0229_SD144_220301, 0229_QC103_220301, 0229_SD119_220301, 0229_SD135_220301, 0229_SD134_220301	01-Mar-2022	----	----	----	08-Mar-2022	15-Mar-2022	✓
HDPE Soil Jar (EA055) 0229_SD136_220302, 0229_SD130_220302, 0229_QC105_220302, 0229_SD217_220302, 0229_SD203_220302, 0229_SD232_220302, 0229_SD233_220302	0229_SD128_220302, 0229_SD243_220302, 0229_SD205_220302, 0229_SD126_220302, 0229_SD129_220302, 0229_SD220_220302,	02-Mar-2022	----	----	----	08-Mar-2022	16-Mar-2022	✓
HDPE Soil Jar (EA055) 0229_SD244_220228, 0229_QC101_220228,	0229_SD245_220228, 0229_SD227_220228	28-Feb-2022	----	----	----	08-Mar-2022	14-Mar-2022	✓
EP231A: Perfluoroalkyl Sulfonic Acids								
HDPE Soil Jar (EP231X) 0229_SD140_220301, 0229_SD110_220301, 0229_SD139_220301, 0229_SD113_220301, 0229_SD120_220301, 0229_SD133_220301,	0229_SD109_220301, 0229_SD144_220301, 0229_QC103_220301, 0229_SD119_220301, 0229_SD135_220301, 0229_SD134_220301	01-Mar-2022	15-Mar-2022	28-Aug-2022	✓	16-Mar-2022	24-Apr-2022	✓
HDPE Soil Jar (EP231X) 0229_SD136_220302, 0229_SD130_220302, 0229_QC105_220302, 0229_SD217_220302, 0229_SD203_220302, 0229_SD232_220302, 0229_SD233_220302	0229_SD128_220302, 0229_SD243_220302, 0229_SD205_220302, 0229_SD126_220302, 0229_SD129_220302, 0229_SD220_220302,	02-Mar-2022	15-Mar-2022	29-Aug-2022	✓	16-Mar-2022	24-Apr-2022	✓
HDPE Soil Jar (EP231X) 0229_SD244_220228, 0229_QC101_220228,	0229_SD245_220228, 0229_SD227_220228	28-Feb-2022	15-Mar-2022	27-Aug-2022	✓	16-Mar-2022	24-Apr-2022	✓



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	
EP231B: Perfluoroalkyl Carboxylic Acids								
HDPE Soil Jar (EP231X) 0229_SD140_220301, 0229_SD110_220301, 0229_SD139_220301, 0229_SD113_220301, 0229_SD120_220301, 0229_SD133_220301,	0229_SD109_220301, 0229_SD144_220301, 0229_QC103_220301, 0229_SD119_220301, 0229_SD135_220301, 0229_SD134_220301	01-Mar-2022	15-Mar-2022	28-Aug-2022	✓	16-Mar-2022	24-Apr-2022	✓
HDPE Soil Jar (EP231X) 0229_SD136_220302, 0229_SD130_220302, 0229_QC105_220302, 0229_SD217_220302, 0229_SD203_220302, 0229_SD232_220302, 0229_SD233_220302	0229_SD128_220302, 0229_SD243_220302, 0229_SD205_220302, 0229_SD126_220302, 0229_SD129_220302, 0229_SD220_220302,	02-Mar-2022	15-Mar-2022	29-Aug-2022	✓	16-Mar-2022	24-Apr-2022	✓
HDPE Soil Jar (EP231X) 0229_SD244_220228, 0229_QC101_220228,	0229_SD245_220228, 0229_SD227_220228	28-Feb-2022	15-Mar-2022	27-Aug-2022	✓	16-Mar-2022	24-Apr-2022	✓
EP231C: Perfluoroalkyl Sulfonamides								
HDPE Soil Jar (EP231X) 0229_SD140_220301, 0229_SD110_220301, 0229_SD139_220301, 0229_SD113_220301, 0229_SD120_220301, 0229_SD133_220301,	0229_SD109_220301, 0229_SD144_220301, 0229_QC103_220301, 0229_SD119_220301, 0229_SD135_220301, 0229_SD134_220301	01-Mar-2022	15-Mar-2022	28-Aug-2022	✓	16-Mar-2022	24-Apr-2022	✓
HDPE Soil Jar (EP231X) 0229_SD136_220302, 0229_SD130_220302, 0229_QC105_220302, 0229_SD217_220302, 0229_SD203_220302, 0229_SD232_220302, 0229_SD233_220302	0229_SD128_220302, 0229_SD243_220302, 0229_SD205_220302, 0229_SD126_220302, 0229_SD129_220302, 0229_SD220_220302,	02-Mar-2022	15-Mar-2022	29-Aug-2022	✓	16-Mar-2022	24-Apr-2022	✓
HDPE Soil Jar (EP231X) 0229_SD244_220228, 0229_QC101_220228,	0229_SD245_220228, 0229_SD227_220228	28-Feb-2022	15-Mar-2022	27-Aug-2022	✓	16-Mar-2022	24-Apr-2022	✓



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) 0229_SD140_220301, 0229_SD110_220301, 0229_SD139_220301, 0229_SD113_220301, 0229_SD120_220301, 0229_SD133_220301,	0229_SD109_220301, 0229_SD144_220301, 0229_QC103_220301, 0229_SD119_220301, 0229_SD135_220301, 0229_SD134_220301	01-Mar-2022	15-Mar-2022	28-Aug-2022	✓	16-Mar-2022	24-Apr-2022	✓
HDPE Soil Jar (EP231X) 0229_SD136_220302, 0229_SD130_220302, 0229_QC105_220302, 0229_SD217_220302, 0229_SD203_220302, 0229_SD232_220302, 0229_SD233_220302	0229_SD128_220302, 0229_SD243_220302, 0229_SD205_220302, 0229_SD126_220302, 0229_SD129_220302, 0229_SD220_220302,	02-Mar-2022	15-Mar-2022	29-Aug-2022	✓	16-Mar-2022	24-Apr-2022	✓
HDPE Soil Jar (EP231X) 0229_SD244_220228, 0229_QC101_220228,	0229_SD245_220228, 0229_SD227_220228	28-Feb-2022	15-Mar-2022	27-Aug-2022	✓	16-Mar-2022	24-Apr-2022	✓
EP231P: PFAS Sums								
HDPE Soil Jar (EP231X) 0229_SD140_220301, 0229_SD110_220301, 0229_SD139_220301, 0229_SD113_220301, 0229_SD120_220301, 0229_SD133_220301,	0229_SD109_220301, 0229_SD144_220301, 0229_QC103_220301, 0229_SD119_220301, 0229_SD135_220301, 0229_SD134_220301	01-Mar-2022	15-Mar-2022	28-Aug-2022	✓	16-Mar-2022	24-Apr-2022	✓
HDPE Soil Jar (EP231X) 0229_SD136_220302, 0229_SD130_220302, 0229_QC105_220302, 0229_SD217_220302, 0229_SD203_220302, 0229_SD232_220302, 0229_SD233_220302	0229_SD128_220302, 0229_SD243_220302, 0229_SD205_220302, 0229_SD126_220302, 0229_SD129_220302, 0229_SD220_220302,	02-Mar-2022	15-Mar-2022	29-Aug-2022	✓	16-Mar-2022	24-Apr-2022	✓
HDPE Soil Jar (EP231X) 0229_SD244_220228, 0229_QC101_220228,	0229_SD245_220228, 0229_SD227_220228	28-Feb-2022	15-Mar-2022	27-Aug-2022	✓	16-Mar-2022	24-Apr-2022	✓

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	
EP231A: Perfluoroalkyl Sulfonic Acids								
HDPE (no PTFE) (EP231X) 0229_SW140_220301, 0229_SW110_220301, 0229_SW139_220301, 0229_SW113_220301, 0229_SW135_220301, 0229_SW132_220301,	0229_SW109_220301, 0229_SW144_220301, 0229_QC102_220301, 0229_SW119_220301, 0229_SW121_220301, 0229_QC301_220301	01-Mar-2022	16-Mar-2022	28-Aug-2022	✓	16-Mar-2022	28-Aug-2022	✓
HDPE (no PTFE) (EP231X) 0229_MW125S_220302, 0229_MW124_220302, 0229_SW233_220302, 0229_SW242_220302, 0229_SW243_220302, 0229_SW205_220302, 0229_SW203_220302,	0229_MW125I_220302, 0229_SW217_220302, 0229_QC104_220302, 0229_SW136_220302, 0229_SW232_220302, 0229_QC302_220302, 0229_SW220_220302	02-Mar-2022	16-Mar-2022	29-Aug-2022	✓	16-Mar-2022	29-Aug-2022	✓
HDPE (no PTFE) (EP231X) 0229_MW233_220303, 0229_MW217_220303, 0229_MW235S_220303, 0229_MW220S_220303, 0229_MW106_220303, 0229_MW131_220303, 0229_MW003_220303, 0229_MW123I_220303, 0229_MW065_220303, 0229_MW138_220303, 0229_MW105_220303, 0229_MW139_220303, 0229_MW121_220303, 0229_QC109_220303, 0229_QC304_220303, 0229_QC305_220303,	0229_MW212_220303, 0229_QC106_220303, 0229_MW205S_220303, 0229_QC107_220303, 0229_MW232_220303, 0229_MW072_220303, 0229_MW074_220303, 0229_MW123S_220303, 0229_MW122_220303, 0229_QC108_220303, 0229_MW002_220303, 0229_MW128_220303, 0229_MW102_220303, 0229_MW120_220303, 0229_MW101_220303, 0229_MW141_220303	03-Mar-2022	16-Mar-2022	30-Aug-2022	✓	16-Mar-2022	30-Aug-2022	✓
HDPE (no PTFE) (EP231X) 0229_QC306_220304, 0229_MW115_220304, 0229_MW135_220304, 0229_MW018_220304,	0229_MW236S_220304, 0229_MW116_220304, 0229_MW114_220304, 0229_QC500_220304	04-Mar-2022	16-Mar-2022	31-Aug-2022	✓	16-Mar-2022	31-Aug-2022	✓
HDPE (no PTFE) (EP231X) 0229_SW244_220228, 0229_QC100_220228, 0229_SW227_220228	0229_SW245_220228, 0229_QC300_220228,	28-Feb-2022	16-Mar-2022	27-Aug-2022	✓	16-Mar-2022	27-Aug-2022	✓



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) 0229_SW140_220301, 0229_SW110_220301, 0229_SW139_220301, 0229_SW113_220301, 0229_SW135_220301, 0229_SW132_220301,	0229_SW109_220301, 0229_SW144_220301, 0229_QC102_220301, 0229_SW119_220301, 0229_SW121_220301, 0229_QC301_220301	01-Mar-2022	16-Mar-2022	28-Aug-2022	✓	16-Mar-2022	28-Aug-2022	✓
HDPE (no PTFE) (EP231X) 0229_MW125S_220302, 0229_MW124_220302, 0229_SW233_220302, 0229_SW242_220302, 0229_SW243_220302, 0229_SW205_220302, 0229_SW203_220302,	0229_MW125I_220302, 0229_SW217_220302, 0229_QC104_220302, 0229_SW136_220302, 0229_SW232_220302, 0229_QC302_220302, 0229_SW220_220302	02-Mar-2022	16-Mar-2022	29-Aug-2022	✓	16-Mar-2022	29-Aug-2022	✓
HDPE (no PTFE) (EP231X) 0229_MW233_220303, 0229_MW217_220303, 0229_MW235S_220303, 0229_MW220S_220303, 0229_MW106_220303, 0229_MW131_220303, 0229_MW003_220303, 0229_MW123I_220303, 0229_MW065_220303, 0229_MW138_220303, 0229_MW105_220303, 0229_MW139_220303, 0229_MW121_220303, 0229_QC109_220303, 0229_QC304_220303, 0229_QC305_220303,	0229_MW212_220303, 0229_QC106_220303, 0229_MW205S_220303, 0229_QC107_220303, 0229_MW232_220303, 0229_MW072_220303, 0229_MW074_220303, 0229_MW123S_220303, 0229_MW122_220303, 0229_QC108_220303, 0229_MW002_220303, 0229_MW128_220303, 0229_MW102_220303, 0229_MW120_220303, 0229_MW101_220303, 0229_MW141_220303	03-Mar-2022	16-Mar-2022	30-Aug-2022	✓	16-Mar-2022	30-Aug-2022	✓
HDPE (no PTFE) (EP231X) 0229_QC306_220304, 0229_MW115_220304, 0229_MW135_220304, 0229_MW018_220304,	0229_MW236S_220304, 0229_MW116_220304, 0229_MW114_220304, 0229_QC500_220304	04-Mar-2022	16-Mar-2022	31-Aug-2022	✓	16-Mar-2022	31-Aug-2022	✓
HDPE (no PTFE) (EP231X) 0229_SW244_220228, 0229_QC100_220228, 0229_SW227_220228	0229_SW245_220228, 0229_QC300_220228,	28-Feb-2022	16-Mar-2022	27-Aug-2022	✓	16-Mar-2022	27-Aug-2022	✓



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) 0229_SW140_220301, 0229_SW110_220301, 0229_SW139_220301, 0229_SW113_220301, 0229_SW135_220301, 0229_SW132_220301,	0229_SW109_220301, 0229_SW144_220301, 0229_QC102_220301, 0229_SW119_220301, 0229_SW121_220301, 0229_QC301_220301	01-Mar-2022	16-Mar-2022	28-Aug-2022	✓	16-Mar-2022	28-Aug-2022	✓
HDPE (no PTFE) (EP231X) 0229_MW125S_220302, 0229_MW124_220302, 0229_SW233_220302, 0229_SW242_220302, 0229_SW243_220302, 0229_SW205_220302, 0229_SW203_220302,	0229_MW125I_220302, 0229_SW217_220302, 0229_QC104_220302, 0229_SW136_220302, 0229_SW232_220302, 0229_QC302_220302, 0229_SW220_220302	02-Mar-2022	16-Mar-2022	29-Aug-2022	✓	16-Mar-2022	29-Aug-2022	✓
HDPE (no PTFE) (EP231X) 0229_MW233_220303, 0229_MW217_220303, 0229_MW235S_220303, 0229_MW220S_220303, 0229_MW106_220303, 0229_MW131_220303, 0229_MW003_220303, 0229_MW123I_220303, 0229_MW065_220303, 0229_MW138_220303, 0229_MW105_220303, 0229_MW139_220303, 0229_MW121_220303, 0229_QC109_220303, 0229_QC304_220303, 0229_QC305_220303,	0229_MW212_220303, 0229_QC106_220303, 0229_MW205S_220303, 0229_QC107_220303, 0229_MW232_220303, 0229_MW072_220303, 0229_MW074_220303, 0229_MW123S_220303, 0229_MW122_220303, 0229_QC108_220303, 0229_MW002_220303, 0229_MW128_220303, 0229_MW102_220303, 0229_MW120_220303, 0229_MW101_220303, 0229_MW141_220303	03-Mar-2022	16-Mar-2022	30-Aug-2022	✓	16-Mar-2022	30-Aug-2022	✓
HDPE (no PTFE) (EP231X) 0229_QC306_220304, 0229_MW115_220304, 0229_MW135_220304, 0229_MW018_220304,	0229_MW236S_220304, 0229_MW116_220304, 0229_MW114_220304, 0229_QC500_220304	04-Mar-2022	16-Mar-2022	31-Aug-2022	✓	16-Mar-2022	31-Aug-2022	✓
HDPE (no PTFE) (EP231X) 0229_SW244_220228, 0229_QC100_220228, 0229_SW227_220228	0229_SW245_220228, 0229_QC300_220228,	28-Feb-2022	16-Mar-2022	27-Aug-2022	✓	16-Mar-2022	27-Aug-2022	✓



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) 0229_SW140_220301, 0229_SW110_220301, 0229_SW139_220301, 0229_SW113_220301, 0229_SW135_220301, 0229_SW132_220301,	0229_SW109_220301, 0229_SW144_220301, 0229_QC102_220301, 0229_SW119_220301, 0229_SW121_220301, 0229_QC301_220301	01-Mar-2022	16-Mar-2022	28-Aug-2022	✓	16-Mar-2022	28-Aug-2022	✓
HDPE (no PTFE) (EP231X) 0229_MW125S_220302, 0229_MW124_220302, 0229_SW233_220302, 0229_SW242_220302, 0229_SW243_220302, 0229_SW205_220302, 0229_SW203_220302,	0229_MW125I_220302, 0229_SW217_220302, 0229_QC104_220302, 0229_SW136_220302, 0229_SW232_220302, 0229_QC302_220302, 0229_SW220_220302	02-Mar-2022	16-Mar-2022	29-Aug-2022	✓	16-Mar-2022	29-Aug-2022	✓
HDPE (no PTFE) (EP231X) 0229_MW233_220303, 0229_MW217_220303, 0229_MW235S_220303, 0229_MW220S_220303, 0229_MW106_220303, 0229_MW131_220303, 0229_MW003_220303, 0229_MW123I_220303, 0229_MW065_220303, 0229_MW138_220303, 0229_MW105_220303, 0229_MW139_220303, 0229_MW121_220303, 0229_QC109_220303, 0229_QC304_220303, 0229_QC305_220303,	0229_MW212_220303, 0229_QC106_220303, 0229_MW205S_220303, 0229_QC107_220303, 0229_MW232_220303, 0229_MW072_220303, 0229_MW074_220303, 0229_MW123S_220303, 0229_MW122_220303, 0229_QC108_220303, 0229_MW002_220303, 0229_MW128_220303, 0229_MW102_220303, 0229_MW120_220303, 0229_MW101_220303, 0229_MW141_220303	03-Mar-2022	16-Mar-2022	30-Aug-2022	✓	16-Mar-2022	30-Aug-2022	✓
HDPE (no PTFE) (EP231X) 0229_QC306_220304, 0229_MW115_220304, 0229_MW135_220304, 0229_MW018_220304,	0229_MW236S_220304, 0229_MW116_220304, 0229_MW114_220304, 0229_QC500_220304	04-Mar-2022	16-Mar-2022	31-Aug-2022	✓	16-Mar-2022	31-Aug-2022	✓
HDPE (no PTFE) (EP231X) 0229_SW244_220228, 0229_QC100_220228, 0229_SW227_220228	0229_SW245_220228, 0229_QC300_220228,	28-Feb-2022	16-Mar-2022	27-Aug-2022	✓	16-Mar-2022	27-Aug-2022	✓



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) 0229_SW140_220301, 0229_SW110_220301, 0229_SW139_220301, 0229_SW113_220301, 0229_SW135_220301, 0229_SW132_220301,	0229_SW109_220301, 0229_SW144_220301, 0229_QC102_220301, 0229_SW119_220301, 0229_SW121_220301, 0229_QC301_220301	01-Mar-2022	16-Mar-2022	28-Aug-2022	✓	16-Mar-2022	28-Aug-2022	✓
HDPE (no PTFE) (EP231X) 0229_MW125S_220302, 0229_MW124_220302, 0229_SW233_220302, 0229_SW242_220302, 0229_SW243_220302, 0229_SW205_220302, 0229_SW203_220302,	0229_MW125I_220302, 0229_SW217_220302, 0229_QC104_220302, 0229_SW136_220302, 0229_SW232_220302, 0229_QC302_220302, 0229_SW220_220302	02-Mar-2022	16-Mar-2022	29-Aug-2022	✓	16-Mar-2022	29-Aug-2022	✓
HDPE (no PTFE) (EP231X) 0229_MW233_220303, 0229_MW217_220303, 0229_MW235S_220303, 0229_MW220S_220303, 0229_MW106_220303, 0229_MW131_220303, 0229_MW003_220303, 0229_MW123I_220303, 0229_MW065_220303, 0229_MW138_220303, 0229_MW105_220303, 0229_MW139_220303, 0229_MW121_220303, 0229_QC109_220303, 0229_QC304_220303, 0229_QC305_220303,	0229_MW212_220303, 0229_QC106_220303, 0229_MW205S_220303, 0229_QC107_220303, 0229_MW232_220303, 0229_MW072_220303, 0229_MW074_220303, 0229_MW123S_220303, 0229_MW122_220303, 0229_QC108_220303, 0229_MW002_220303, 0229_MW128_220303, 0229_MW102_220303, 0229_MW120_220303, 0229_MW101_220303, 0229_MW141_220303	03-Mar-2022	16-Mar-2022	30-Aug-2022	✓	16-Mar-2022	30-Aug-2022	✓
HDPE (no PTFE) (EP231X) 0229_QC306_220304, 0229_MW115_220304, 0229_MW135_220304, 0229_MW018_220304,	0229_MW236S_220304, 0229_MW116_220304, 0229_MW114_220304, 0229_QC500_220304	04-Mar-2022	16-Mar-2022	31-Aug-2022	✓	16-Mar-2022	31-Aug-2022	✓
HDPE (no PTFE) (EP231X) 0229_SW244_220228, 0229_QC100_220228, 0229_SW227_220228	0229_SW245_220228, 0229_QC300_220228,	28-Feb-2022	16-Mar-2022	27-Aug-2022	✓	16-Mar-2022	27-Aug-2022	✓



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	Method	Count		Rate (%)			Quality Control Specification
		QC	Regular	Actual	Expected	Evaluation	
<i>Analytical Methods</i>							
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	3	29	10.34	10.00	✔	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	29	6.90	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	29	6.90	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	29	6.90	5.00	✔	NEPM 2013 B3 & ALS QC Standard

Matrix: WATER

Evaluation: ✖ = Quality Control frequency not within specification ; ✔ = Quality Control frequency within specification.

Quality Control Sample Type	Method	Count		Rate (%)			Quality Control Specification
		QC	Regular	Actual	Expected	Evaluation	
<i>Analytical Methods</i>							
Laboratory Duplicates (DUP)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	6	71	8.45	10.00	✖	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	4	71	5.63	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	4	71	5.63	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	4	71	5.63	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.
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
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.
Solid Phase Extraction (SPE) for PFAS in water	ORG72	WATER	In-house: Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to the sample container. The entire contents are transferred to a solid phase extraction (SPE) cartridge. The sample container is successively rinsed with aliquots of the elution solvent. The eluted extract is combined with an equal volume of reagent water and a portion is filtered for analysis. Method procedures conform to US DoD QSM 5.3, table B-15 requirements.



SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : ET2201359

Client	: AECOM AUSTRALIA PTY LTD	Laboratory	: Environmental Division Townsville
Contact	: [REDACTED]	Contact	: [REDACTED]
Address	: PO BOX 1307 FORTITUDE VALLEY QLD, AUSTRALIA 4006	Address	: 13 Carlton Street, Kirwan Townsville QLD Australia 4815
E-mail	: [REDACTED]	E-mail	: [REDACTED]
Telephone	: [REDACTED]	Telephone	: [REDACTED]
Facsimile	: [REDACTED]	Facsimile	: [REDACTED]
Project	: QLD_0229_PFASOMP_20	Page	: 1 of 5
Order number	:	Quote number	: ET2021AECOMAU0001 (TV/007/21 v2 - Compass)
C-O-C number	: 34488	QC Level	: NEPM 2013 B3 & ALS QC Standard
Site	: QLD_0229		
Sampler	: [REDACTED]		

Dates

Date Samples Received	: 08-Mar-2022 09:10	Issue Date	: 08-Mar-2022
Client Requested Due Date	: 18-Mar-2022	Scheduled Reporting Date	: 18-Mar-2022

Delivery Details

Mode of Delivery	: Carrier	Security Seal	: Intact.
No. of coolers/boxes	: 2	Temperature	: 10.8°C, 6.1°C - Ice present
Receipt Detail	: MEDIUM ESKY	No. of samples received / analysed	: 101 / 100

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 be advised that low volume was received for samples 0229_MW106_220303 & 0229_QC302_220302. ALS will attempt to undertake all analysis requested
- Discounted Package Prices apply only when specific ALS Group Codes ('W', 'S', 'NT' suites) are referenced on COCs.
- Please direct any turn around / technical queries to the laboratory contact designated above.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months ± 1 week) from receipt of samples.
- All analysis will be conducted by ALS Environmental, Brisbane, NATA accreditation no. 825, Site No. 818.
- 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.
- **Please refer to the Proactive Holding Time Report table below which summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory. The laboratory will process these samples unless instructions are received from you indicating you do not wish to proceed. The absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.**



Sample 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)
ET2201359-002	01-Mar-2022 10:30	0229_SD140_220301	✓	✓
ET2201359-004	01-Mar-2022 11:11	0229_SD109_220301	✓	✓
ET2201359-005	01-Mar-2022 11:35	0229_SD110_220301	✓	✓
ET2201359-007	01-Mar-2022 11:55	0229_SD144_220301	✓	✓
ET2201359-011	01-Mar-2022 12:54	0229_SD139_220301	✓	✓
ET2201359-012	01-Mar-2022 12:55	0229_QC103_220301	✓	✓
ET2201359-013	01-Mar-2022 13:22	0229_SD113_220301	✓	✓
ET2201359-015	01-Mar-2022 14:20	0229_SD119_220301	✓	✓
ET2201359-017	01-Mar-2022 14:35	0229_SD120_220301	✓	✓
ET2201359-019	01-Mar-2022 14:48	0229_SD135_220301	✓	✓
ET2201359-021	01-Mar-2022 15:27	0229_SD133_220301	✓	✓
ET2201359-022	01-Mar-2022 15:39	0229_SD134_220301	✓	✓
ET2201359-028	28-Feb-2022 10:20	0229_SD244_220228	✓	✓
ET2201359-030	28-Feb-2022 08:45	0229_SD245_220228	✓	✓
ET2201359-033	28-Feb-2022 10:20	0229_QC101_220228	✓	✓
ET2201359-036	28-Feb-2022 11:30	0229_SD227_220228	✓	✓
ET2201359-080	02-Mar-2022 09:00	0229_SD136_220302	✓	✓
ET2201359-081	02-Mar-2022 10:50	0229_SD128_220302	✓	✓
ET2201359-082	02-Mar-2022 09:30	0229_SD130_220302	✓	✓
ET2201359-083	02-Mar-2022 14:10	0229_SD243_220302	✓	✓
ET2201359-084	02-Mar-2022 12:00	0229_QC105_220302	✓	✓
ET2201359-085	02-Mar-2022 11:30	0229_SD205_220302	✓	✓
ET2201359-086	02-Mar-2022 13:00	0229_SD217_220302	✓	✓
ET2201359-087	02-Mar-2022 11:00	0229_SD126_220302	✓	✓
ET2201359-088	02-Mar-2022 12:00	0229_SD203_220302	✓	✓
ET2201359-089	02-Mar-2022 09:50	0229_SD129_220302	✓	✓
ET2201359-090	02-Mar-2022 14:30	0229_SD232_220302	✓	✓
ET2201359-091	02-Mar-2022 13:25	0229_SD220_220302	✓	✓
ET2201359-092	02-Mar-2022 12:38	0229_SD233_220302	✓	✓



Matrix: **WATER**

Laboratory sample ID	Sampling date / time	Sample ID	(On Hold) WATER No analysis requested	WATER - EP231X PFAS - Full Suite (28 analytes)
ET2201359-001	01-Mar-2022 10:30	0229_SW140_220301		✓
ET2201359-003	01-Mar-2022 11:11	0229_SW109_220301		✓
ET2201359-006	01-Mar-2022 11:36	0229_SW110_220301		✓
ET2201359-008	01-Mar-2022 11:56	0229_SW144_220301		✓
ET2201359-009	01-Mar-2022 12:53	0229_SW139_220301		✓
ET2201359-010	01-Mar-2022 12:54	0229_QC102_220301		✓
ET2201359-014	01-Mar-2022 13:22	0229_SW113_220301		✓
ET2201359-016	01-Mar-2022 14:21	0229_SW119_220301		✓
ET2201359-018	01-Mar-2022 14:47	0229_SW135_220301		✓
ET2201359-020	01-Mar-2022 15:14	0229_SW121_220301		✓
ET2201359-023	01-Mar-2022 15:53	0229_SW132_220301		✓
ET2201359-024	01-Mar-2022 17:38	0229_QC301_220301		✓
ET2201359-025	02-Mar-2022 09:33	0229_MW125S_220302		✓
ET2201359-026	02-Mar-2022 09:30	0229_MW125I_220302		✓
ET2201359-027	02-Mar-2022 09:41	0229_MW124_220302		✓
ET2201359-029	28-Feb-2022 10:20	0229_SW244_220228		✓
ET2201359-031	28-Feb-2022 08:45	0229_SW245_220228		✓
ET2201359-032	28-Feb-2022 10:20	0229_QC100_220228		✓
ET2201359-034	28-Feb-2022 12:15	0229_QC300_220228		✓
ET2201359-035	28-Feb-2022 11:30	0229_SW227_220228		✓
ET2201359-037	03-Mar-2022 10:13	0229_MW233_220303		✓
ET2201359-038	03-Mar-2022 10:30	0229_MW212_220303		✓
ET2201359-039	03-Mar-2022 11:12	0229_MW217_220303		✓
ET2201359-040	03-Mar-2022 11:14	0229_QC106_220303		✓
ET2201359-041	03-Mar-2022 11:41	0229_MW235S_220303		✓
ET2201359-042	03-Mar-2022 12:01	0229_MW205S_220303		✓
ET2201359-043	03-Mar-2022 12:28	0229_MW220S_220303		✓
ET2201359-044	03-Mar-2022 12:28	0229_QC107_220303		✓
ET2201359-045	03-Mar-2022 12:29	0229_QC303_220303	✓	
ET2201359-046	03-Mar-2022 11:56	0229_MW106_220303		✓
ET2201359-047	03-Mar-2022 12:56	0229_MW232_220303		✓
ET2201359-048	03-Mar-2022 13:10	0229_MW131_220303		✓
ET2201359-049	03-Mar-2022 13:35	0229_MW072_220303		✓
ET2201359-050	03-Mar-2022 13:37	0229_MW003_220303		✓
ET2201359-051	03-Mar-2022 13:51	0229_MW074_220303		✓
ET2201359-052	03-Mar-2022 13:52	0229_MW123I_220303		✓
ET2201359-053	03-Mar-2022 14:11	0229_MW123S_220303		✓
ET2201359-054	03-Mar-2022 14:24	0229_MW065_220303		✓
ET2201359-055	03-Mar-2022 14:38	0229_MW122_220303		✓
ET2201359-056	03-Mar-2022 14:39	0229_MW138_220303		✓
ET2201359-057	03-Mar-2022 14:40	0229_QC108_220303		✓



			(On Hold) WATER No analysis requested	WATER - EP231X PFAS - Full Suite (28 analytes)
ET2201359-058	03-Mar-2022 15:05	0229_MW105_220303		✓
ET2201359-059	03-Mar-2022 14:54	0229_MW002_220303		✓
ET2201359-060	03-Mar-2022 15:12	0229_MW139_220303		✓
ET2201359-061	03-Mar-2022 15:17	0229_MW128_220303		✓
ET2201359-062	03-Mar-2022 15:42	0229_MW121_220303		✓
ET2201359-063	03-Mar-2022 15:52	0229_MW102_220303		✓
ET2201359-064	03-Mar-2022 15:53	0229_QC109_220303		✓
ET2201359-065	03-Mar-2022 16:02	0229_MW120_220303		✓
ET2201359-066	03-Mar-2022 16:04	0229_QC304_220303		✓
ET2201359-067	03-Mar-2022 16:11	0229_MW101_220303		✓
ET2201359-068	03-Mar-2022 16:17	0229_QC305_220303		✓
ET2201359-069	02-Mar-2022 13:00	0229_SW217_220302		✓
ET2201359-070	02-Mar-2022 12:38	0229_SW233_220302		✓
ET2201359-071	02-Mar-2022 12:00	0229_QC104_220302		✓
ET2201359-072	02-Mar-2022 13:50	0229_SW242_220302		✓
ET2201359-073	02-Mar-2022 09:00	0229_SW136_220302		✓
ET2201359-074	02-Mar-2022 14:08	0229_SW243_220302		✓
ET2201359-075	02-Mar-2022 14:34	0229_SW232_220302		✓
ET2201359-076	02-Mar-2022 11:30	0229_SW205_220302		✓
ET2201359-077	02-Mar-2022 15:10	0229_QC302_220302		✓
ET2201359-078	02-Mar-2022 12:00	0229_SW203_220302		✓
ET2201359-079	02-Mar-2022 13:25	0229_SW220_220302		✓
ET2201359-093	04-Mar-2022 13:00	0229_QC306_220304		✓
ET2201359-094	04-Mar-2022 09:55	0229_MW236S_220304		✓
ET2201359-095	04-Mar-2022 11:05	0229_MW115_220304		✓
ET2201359-096	04-Mar-2022 10:55	0229_MW116_220304		✓
ET2201359-097	04-Mar-2022 10:30	0229_MW135_220304		✓
ET2201359-098	04-Mar-2022 11:32	0229_MW114_220304		✓
ET2201359-099	04-Mar-2022 12:10	0229_MW018_220304		✓
ET2201359-100	04-Mar-2022 14:13	0229_QC500_220304		✓
ET2201359-101	03-Mar-2022 14:05	0229_MW141_220303		✓

Proactive Holding Time Report

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



Requested Deliverables

ACCOUNTS PAYABLE

- A4 - AU Tax Invoice (INV)

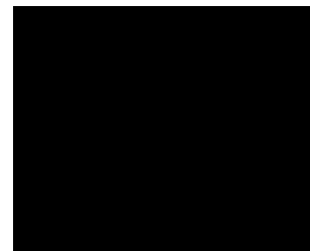
Email

AP_CustomerService.ANZ@aecom.com



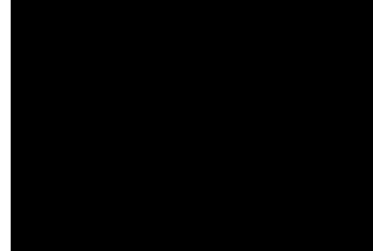
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- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)
- A4 - AU Tax Invoice (INV)
- Chain of Custody (CoC) (COC)
- EDI Format - ENMRG (ENMRG)
- EDI Format - ESDAT (ESDAT)

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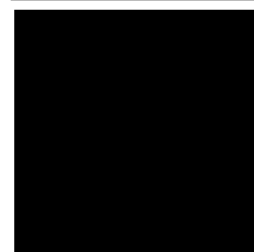
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- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)
- Chain of Custody (CoC) (COC)
- EDI Format - ENMRG (ENMRG)
- EDI Format - ESDAT (ESDAT)

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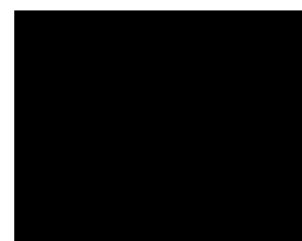
- *AU Certificate of Analysis - NATA (COA)
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)
- A4 - AU Tax Invoice (INV)
- Chain of Custody (CoC) (COC)
- EDI Format - EQUIS V5 AECOM (EQUIS_V5_AECOM)
- EDI Format - ESDAT (ESDAT)

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

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CERTIFICATE OF ANALYSIS

Work Order : **ET2202340**
Client : **AECOM AUSTRALIA PTY LTD**
Contact : [REDACTED]
Address : PO BOX 1307
 FORTITUDE VALLEY QLD, AUSTRALIA 4006
Telephone : ----
Project : QLD_0229_PFASOMP_20
Order number : 60612487_3.2
C-O-C number : 36676
Sampler : [REDACTED]
Site : QLD_0229
Quote number : TV/007/21 v2 - Compass
No. of samples received : 16
No. of samples analysed : 16

Page : 1 of 13
Laboratory : Environmental Division Townsville
Contact : [REDACTED]
Address : 13 Carlton Street, Kirwan Townsville QLD Australia 4815
Telephone : [REDACTED]
Date Samples Received : 27-Apr-2022 08:50
Date Analysis Commenced : 28-Apr-2022
Issue Date : 06-May-2022 15:34



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.

<i>Signatories</i>	<i>Position</i>	<i>Accreditation Category</i>
[REDACTED]	Senior Inorganic Chemist	Brisbane Inorganics, Stafford, QLD
[REDACTED]	2IC Organic Chemist	Brisbane Organics, Stafford, QLD



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 Contact 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.
- All remaining analysis will be conducted by ALS Environmental, Brisbane, NATA accreditation no. 825, Site No. 818.
- 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.
- 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		0229_SD132_220422	0229_SD242_220422	----	----	----
		Sampling date / time		22-Apr-2022 16:06	22-Apr-2022 16:25	----	----	----
Compound	CAS Number	LOR	Unit	ET2202340-012	ET2202340-013	-----	-----	-----
				Result	Result	----	----	----
EA055: Moisture Content (Dried @ 105-110°C)								
Moisture Content	----	0.1	%	16.3	27.2	----	----	----
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	0.0048	0.0004	----	----	----
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	----	----	----
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	<0.0005	----	----	----



Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)				Sample ID	0229_SD132_220422	0229_SD242_220422	----	----	----
Sampling date / time				22-Apr-2022 16:06	22-Apr-2022 16:25	----	----	----	
Compound	CAS Number	LOR	Unit	ET2202340-012	ET2202340-013	-----	-----	-----	
				Result	Result	----	----	----	
EP231C: Perfluoroalkyl Sulfonamides - Continued									
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	0.0050	0.0004	----	----	----	
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg	0.0050	0.0004	----	----	----	
Sum of PFAS (WA DER List)	----	0.0002	mg/kg	0.0050	0.0004	----	----	----	
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.0002	%	108	114	----	----	----	
13C8-PFOA	----	0.0002	%	124	112	----	----	----	



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)		Sample ID		0229_SD121_220422	----	----	----	----
		Sampling date / time		22-Apr-2022 15:57	----	----	----	----
Compound	CAS Number	LOR	Unit	ET2202340-011	-----	-----	-----	-----
				Result	----	----	----	----
EA055: Moisture Content (Dried @ 105-110°C)								
Moisture Content	----	0.1	%	28.1	----	----	----	----
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	0.0052	----	----	----	----
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	0.0002	----	----	----	----
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	0.0043	----	----	----	----
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	----	----	----	----
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	----	----	----	----



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	0229_SD121_220422	----	----	----	----
Sampling date / time				22-Apr-2022 15:57	----	----	----	----	----
Compound	CAS Number	LOR	Unit	ET2202340-011	-----	-----	-----	-----	-----
				Result	----	----	----	----	----
EP231C: Perfluoroalkyl Sulfonamides - Continued									
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	0.0099	----	----	----	----	----
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg	0.0095	----	----	----	----	----
Sum of PFAS (WA DER List)	----	0.0002	mg/kg	0.0095	----	----	----	----	----
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.0002	%	108	----	----	----	----	----
13C8-PFOA	----	0.0002	%	120	----	----	----	----	----



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	0229_MW217_220422	0229_SW120_220422	0229_SW133_220422	0229_SW134_220422	0229_SW130_220422
Sampling date / time				22-Apr-2022 13:34	22-Apr-2022 14:09	22-Apr-2022 14:26	22-Apr-2022 14:36	22-Apr-2022 14:49	
Compound	CAS Number	LOR	Unit	ET2202340-001	ET2202340-002	ET2202340-003	ET2202340-004	ET2202340-005	
				Result	Result	Result	Result	Result	
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.02	<0.02	<0.02	0.06	
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	0.04	
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	0.01	0.05	0.04	<0.01	0.19	
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02	
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.04	0.04	<0.01	0.04	
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	0.03	
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02	
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	<0.01	<0.01	<0.01	<0.01	
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02	
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02	
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02	
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02	
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02	
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05	
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02	
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05	
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05	



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	0229_MW217_220422	0229_SW120_220422	0229_SW133_220422	0229_SW134_220422	0229_SW130_220422
Sampling date / time					22-Apr-2022 13:34	22-Apr-2022 14:09	22-Apr-2022 14:26	22-Apr-2022 14:36	22-Apr-2022 14:49
Compound	CAS Number	LOR	Unit	ET2202340-001	ET2202340-002	ET2202340-003	ET2202340-004	ET2202340-005	
				Result	Result	Result	Result	Result	
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05	
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05	
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02	
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02	
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05	
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05	
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05	
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05	
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L	0.01	0.11	0.08	<0.01	0.36	
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	0.01	0.09	0.08	<0.01	0.23	
Sum of PFAS (WA DER List)	----	0.01	µg/L	0.01	0.11	0.08	<0.01	0.32	
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%	105	105	112	118	110	
13C8-PFOA	----	0.02	%	98.9	106	104	96.7	104	



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	0229_SW129_220422	0229_QC150_220422	0229_SW128_220422	0229_SW126_220422	0229_QC350_220422
Sampling date / time				22-Apr-2022 15:07	22-Apr-2022 15:07	22-Apr-2022 15:18	22-Apr-2022 15:32	22-Apr-2022 15:38	
Compound	CAS Number	LOR	Unit	ET2202340-006	ET2202340-007	ET2202340-008	ET2202340-009	ET2202340-010	
				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	0.06	0.06	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	<0.02	
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	0.03	0.03	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	
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1	
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02	
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02	
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02	
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	<0.01	<0.01	<0.01	<0.01	
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02	
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02	
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02	
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02	
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02	
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05	
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02	
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05	
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05	



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	0229_SW129_220422	0229_QC150_220422	0229_SW128_220422	0229_SW126_220422	0229_QC350_220422
Sampling date / time				22-Apr-2022 15:07	22-Apr-2022 15:07	22-Apr-2022 15:18	22-Apr-2022 15:32	22-Apr-2022 15:38	
Compound	CAS Number	LOR	Unit	ET2202340-006	ET2202340-007	ET2202340-008	ET2202340-009	ET2202340-010	
				Result	Result	Result	Result	Result	
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05	
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05	
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02	
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02	
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05	
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05	
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05	
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05	
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L	0.09	0.09	0.06	<0.01	<0.01	
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	0.09	0.09	0.06	<0.01	<0.01	
Sum of PFAS (WA DER List)	----	0.01	µg/L	0.09	0.09	0.06	<0.01	<0.01	
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%	114	108	121	109	99.1	
13C8-PFOA	----	0.02	%	106	104	99.2	101	109	



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	0229_QC550_220422	0229_SW110_220426	0229_QC351_220426	----	----
Sampling date / time				22-Apr-2022 08:00	26-Apr-2022 10:01	26-Apr-2022 10:02	----	----	
Compound	CAS Number	LOR	Unit	ET2202340-014	ET2202340-015	ET2202340-016	-----	-----	
				Result	Result	Result	----	----	
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	<0.02	<0.02	----	----	
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	<0.02	<0.02	----	----	
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	0.01	<0.01	----	----	
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	<0.02	<0.02	----	----	
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.02	<0.01	----	----	
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	<0.02	<0.02	----	----	
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	<0.1	<0.1	----	----	
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	<0.02	<0.02	----	----	
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	<0.02	<0.02	----	----	
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	<0.02	<0.02	----	----	
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	<0.01	<0.01	----	----	
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	<0.02	<0.02	----	----	
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	<0.02	<0.02	----	----	
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	<0.02	<0.02	----	----	
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	<0.02	<0.02	----	----	
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	<0.02	<0.02	----	----	
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	<0.05	<0.05	----	----	
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	<0.02	<0.02	----	----	
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	<0.05	<0.05	----	----	
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	<0.05	<0.05	----	----	



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	0229_QC550_220422	0229_SW110_220426	0229_QC351_220426	----	----
Sampling date / time				22-Apr-2022 08:00	26-Apr-2022 10:01	26-Apr-2022 10:02	----	----	
Compound	CAS Number	LOR	Unit	ET2202340-014	ET2202340-015	ET2202340-016	-----	-----	
				Result	Result	Result	----	----	
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	<0.05	<0.05	----	----	
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	<0.05	<0.05	----	----	
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	<0.02	<0.02	----	----	
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	<0.02	<0.02	----	----	
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	<0.05	<0.05	----	----	
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	<0.05	<0.05	----	----	
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	<0.05	<0.05	----	----	
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	<0.05	<0.05	----	----	
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L	<0.01	0.03	<0.01	----	----	
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	<0.01	0.03	<0.01	----	----	
Sum of PFAS (WA DER List)	----	0.01	µg/L	<0.01	0.03	<0.01	----	----	
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%	116	94.5	88.3	----	----	
13C8-PFOA	----	0.02	%	104	102	98.4	----	----	



Surrogate Control Limits

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

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

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

Inter-Laboratory Testing

Analysis conducted by ALS Brisbane, NATA accreditation no. 825, site no. 818 (Chemistry) 18958 (Biology).

- (WATER) EP231B: Perfluoroalkyl Carboxylic Acids
- (WATER) EP231C: Perfluoroalkyl Sulfonamides
- (WATER) EP231D: (n:2) Fluorotelomer Sulfonic Acids
- (WATER) EP231P: PFAS Sums
- (WATER) EP231S: PFAS Surrogate
- (WATER) EP231A: Perfluoroalkyl Sulfonic Acids
- (SOIL) EP231B: Perfluoroalkyl Carboxylic Acids
- (SOIL) EP231D: (n:2) Fluorotelomer Sulfonic Acids
- (SOIL) EP231C: Perfluoroalkyl Sulfonamides
- (SOIL) EP231A: Perfluoroalkyl Sulfonic Acids
- (SOIL) EP231P: PFAS Sums
- (SOIL) EP231S: PFAS Surrogate
- (SOIL) EA055: Moisture Content (Dried @ 105-110°C)



QUALITY CONTROL REPORT

Work Order : ET2202340
Client : AECOM AUSTRALIA PTY LTD
Contact :
Address : PO BOX 1307
FORTITUDE VALLEY QLD, AUSTRALIA 4006
Telephone :
Project : QLD_0229_PFASOMP_20
Order number : 60612487_3.2
C-O-C number : 36676
Sampler :
Site : QLD_0229
Quote number : TV/007/21 v2 - Compass
No. of samples received : 16
No. of samples analysed : 16

Page : 1 of 12
Laboratory : Environmental Division Townsville
Contact :
Address : 13 Carlton Street, Kirwan Townsville QLD Australia 4815
Telephone :
Date Samples Received : 27-Apr-2022
Date Analysis Commenced : 28-Apr-2022
Issue Date : 06-May-2022



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.

Table with 3 columns: Signatories, Position, Accreditation Category. Includes entries for Senior Inorganic Chemist and 2IC Organic Chemist at Brisbane Inorganics and Organics, Stafford, QLD.



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: 4309343)									
EB2211410-002	Anonymous	EA055: Moisture Content	----	0.1	%	61.6	61.6	0.0	0% - 20%
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 4309342)									
EB2211410-002	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	<0.0016	<0.0016	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
ET2202229-004	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
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 4309342)									
EB2211410-002	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 (PFTTrDA)	72629-94-8	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: 4309342) - continued									
EB2211410-002	Anonymous	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
ET2202229-004	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
		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: 4309342)									
EB2211410-002	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
		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
ET2202229-004	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
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 4309342)									



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: 4309342) - continued									
EB2211410-002	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
ET2202229-004	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

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: 4311958)									
ET2202340-003	0229_SW133_220422	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	0.04	0.04	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: 4320627)									
ET2202340-015	0229_SW110_220426	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	0.02	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: 4311958)									
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
ET2202340-003	0229_SW133_220422	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: 4311958) - continued									
ET2202340-003	0229_SW133_220422	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: 4320627)									
ET2202340-015	0229_SW110_220426	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: 4311958)									
ET2202340-003	0229_SW133_220422	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: 4320627)									
ET2202340-015	0229_SW110_220426	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: 4320627) - continued									
ET2202340-015	0229_SW110_220426	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: 4311958)									
ET2202340-003	0229_SW133_220422	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: 4320627)									
ET2202340-015	0229_SW110_220426	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: 4311958)									
ET2202340-003	0229_SW133_220422	EP231X: Sum of PFAS	----	0.01	µg/L	0.08	0.08	0.0	No Limit
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	0.08	0.08	0.0	No Limit
		EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	0.08	0.08	0.0	No Limit
EP231P: PFAS Sums (QC Lot: 4320627)									
ET2202340-015	0229_SW110_220426	EP231X: Sum of PFAS	----	0.01	µg/L	0.03	0.03	0.0	No Limit
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	0.03	0.03	0.0	No Limit
		EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	0.03	0.03	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: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report				
				Result	Spike Concentration	Spike Recovery (%)		Acceptable Limits (%)	
						LCS	Low	High	
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4309342)									
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	0.0011 mg/kg	90.0	72.0	128	
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	0.00117 mg/kg	76.5	73.0	123	
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	0.00118 mg/kg	77.5	67.0	130	
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	0.00119 mg/kg	76.5	70.0	132	
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	0.00116 mg/kg	83.6	68.0	136	
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	0.0012 mg/kg	72.9	59.0	134	
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4309342)									
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	0.00625 mg/kg	73.1	71.0	135	
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	0.00125 mg/kg	80.8	69.0	132	
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	0.00125 mg/kg	78.0	70.0	132	
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	0.00125 mg/kg	74.4	71.0	131	
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	80.8	69.0	133	
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	76.4	72.0	129	
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	0.00125 mg/kg	77.2	69.0	133	
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	70.8	64.0	136	
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	80.0	69.0	135	
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	76.4	66.0	139	
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	0.00312 mg/kg	81.1	69.0	133	
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4309342)									
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	0.00125 mg/kg	85.2	67.0	137	
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	0.00312 mg/kg	84.0	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	79.8	61.5	139	
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	0.00312 mg/kg	88.0	61.9	137	
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	0.00125 mg/kg	78.0	63.0	144	
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	0.00125 mg/kg	77.6	61.0	139	
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4309342)									
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	0.00117 mg/kg	73.5	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	86.4	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	72.1	65.0	137	



Sub-Matrix: **SOIL**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report Result	Laboratory Control Spike (LCS) Report				
					Spike Concentration	Spike Recovery (%)		Acceptable Limits (%)	
						LCS	Low	High	
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4309342) - continued									
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	0.0012 mg/kg	69.6	54.8	124	

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report Result	Laboratory Control Spike (LCS) Report				
					Spike Concentration	Spike Recovery (%)		Acceptable Limits (%)	
						LCS	Low	High	
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4311958)									
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.2218 µg/L	98.1	72.0	130	
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.2352 µg/L	85.2	71.0	127	
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	0.2373 µg/L	86.4	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	98.5	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	
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4320627)									
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	96.9	71.0	127	
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	0.2373 µg/L	98.2	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	86.6	65.0	140	
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.241 µg/L	81.7	53.0	142	
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4311958)									
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	1.25 µg/L	95.9	73.0	129	
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	0.25 µg/L	95.8	72.0	129	
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	0.25 µg/L	97.2	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	96.4	71.0	133	
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	0.25 µg/L	95.6	69.0	130	
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	0.25 µg/L	109	71.0	129	
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	0.25 µg/L	94.8	69.0	133	
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	0.25 µg/L	119	72.0	134	
EP231X: Perfluorotridecanoic acid (PFTTrDA)	72629-94-8	0.02	µg/L	<0.02	0.25 µg/L	113	65.0	144	
EP231X: Perfluorotetradecanoic acid (PFTTeDA)	376-06-7	0.05	µg/L	<0.05	0.625 µg/L	100	71.0	132	
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4320627)									
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	1.25 µg/L	85.2	73.0	129	
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	0.25 µg/L	95.0	72.0	129	
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	0.25 µg/L	90.8	72.0	129	
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	0.25 µg/L	84.6	72.0	130	
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	0.25 µg/L	89.0	71.0	133	
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	0.25 µg/L	81.8	69.0	130	
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	0.25 µg/L	84.0	71.0	129	



Sub-Matrix: WATER

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
				Result	Spike Concentration	Spike Recovery (%)	Acceptable Limits (%)	
					LCS	Low	High	
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4320627) - continued								
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	0.25 µg/L	87.0	69.0	133
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	0.25 µg/L	84.6	72.0	134
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	0.25 µg/L	83.6	65.0	144
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	0.625 µg/L	87.1	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4311958)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.25 µg/L	96.4	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	0.625 µg/L	115	68.0	141
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	0.625 µg/L	94.4	60.5	138
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	0.625 µg/L	91.2	68.3	134
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	0.625 µg/L	89.5	62.6	138
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	0.25 µg/L	99.0	65.0	136
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	0.25 µg/L	92.2	61.0	135
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4320627)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.25 µg/L	96.0	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	0.625 µg/L	92.2	68.0	141
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	0.625 µg/L	81.7	60.5	138
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	0.625 µg/L	82.6	68.3	134
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	0.625 µg/L	90.0	62.6	138
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	0.25 µg/L	75.8	65.0	136
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	0.25 µg/L	94.6	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4311958)								
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	89.4	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	89.0	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	95.0	64.2	133
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4320627)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.2343 µg/L	81.1	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	90.6	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	88.1	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	82.8	64.2	133
EP231P: PFAS Sums (QCLot: 4311958)								



Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report Result	Laboratory Control Spike (LCS) Report			
					Spike Concentration	Spike Recovery (%)	Acceptable Limits (%)	
						LCS	Low	High
EP231P: PFAS Sums (QCLot: 4311958) - continued								
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: 4320627)								
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: **SOIL**

Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report			
				Spike Concentration	Spike Recovery (%) MS	Acceptable Limits (%) Low	Acceptable Limits (%) High
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4309342)							
EB2211593-001	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0011 mg/kg	99.1	72.0	128
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.00117 mg/kg	90.2	73.0	123
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.00118 mg/kg	95.8	67.0	130
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.00119 mg/kg	88.2	70.0	132
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.00116 mg/kg	93.5	68.0	136
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0012 mg/kg	80.8	59.0	134
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4309342)							
EB2211593-001	Anonymous	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.00625 mg/kg	84.1	71.0	135
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.00125 mg/kg	81.6	69.0	132
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.00125 mg/kg	82.0	70.0	132
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.00125 mg/kg	84.0	71.0	131
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.00125 mg/kg	93.6	69.0	133
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.00125 mg/kg	83.2	72.0	129
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.00125 mg/kg	78.0	69.0	133
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.00125 mg/kg	80.8	64.0	136
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.00125 mg/kg	88.8	69.0	135
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.00125 mg/kg	88.8	66.0	139
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.00312 mg/kg	90.7	69.0	133
		EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4309342)					
EB2211593-001	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.00125 mg/kg	82.8	48.0	128



Sub-Matrix: **SOIL**

				Matrix Spike (MS) Report			
				Spike Concentration	SpikeRecovery(%) MS	Acceptable Limits (%)	
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4309342) - continued							
EB2211593-001	Anonymous	EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.00312 mg/kg	107	70.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.00312 mg/kg	79.6	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.00312 mg/kg	82.2	70.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.00312 mg/kg	100.0	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.00125 mg/kg	76.4	63.0	144
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.00125 mg/kg	96.0	61.0	139
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4309342)							
EB2211593-001	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.00117 mg/kg	81.2	62.0	145
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.00118 mg/kg	117	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0012 mg/kg	76.2	65.0	137
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0012 mg/kg	77.5	70.0	130

Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike Concentration	SpikeRecovery(%) MS	Acceptable Limits (%)	
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4311958)							
ET2202340-008	0229_SW128_220422	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.2218 µg/L	106	72.0	130
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.235 µg/L	107	71.0	127
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.2352 µg/L	110	68.0	131
		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	101	65.0	140
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.241 µg/L	93.2	53.0	142
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4311958)							
ET2202340-008	0229_SW128_220422	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	1.25 µg/L	110	73.0	129
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.25 µg/L	94.5	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	107	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	110	69.0	130
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.25 µg/L	97.3	71.0	129
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.25 µg/L	89.7	69.0	133
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.25 µg/L	88.7	72.0	134
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.25 µg/L	85.8	65.0	144
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.625 µg/L	107	71.0	132



Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4311958)							
ET2202340-008	0229_SW128_220422	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.25 µg/L	93.8	59.0	135
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.625 µg/L	91.5	70.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.625 µg/L	110	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.625 µg/L	98.7	70.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.625 µg/L	96.9	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.25 µg/L	105	65.0	136
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.25 µg/L	105	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4311958)							
ET2202340-008	0229_SW128_220422	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.234 µg/L	106	63.0	143
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.2378 µg/L	83.4	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	86.6	70.0	130

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: ET2202340	Page	: 1 of 6
Client	: AECOM AUSTRALIA PTY LTD	Laboratory	: Environmental Division Townsville
Contact	: [REDACTED]	Telephone	: [REDACTED]
Project	: QLD_0229_PFASOMP_20	Date Samples Received	: 27-Apr-2022
Site	: QLD_0229	Issue Date	: 06-May-2022
Sampler	: [REDACTED]	No. of samples received	: 16
Order number	: 60612487_3.2	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) 0229_SD121_220422, 0229_SD242_220422	0229_SD132_220422,	22-Apr-2022	----	----	----	28-Apr-2022	06-May-2022	✓
EP231A: Perfluoroalkyl Sulfonic Acids								
HDPE Soil Jar (EP231X) 0229_SD121_220422, 0229_SD242_220422	0229_SD132_220422,	22-Apr-2022	29-Apr-2022	19-Oct-2022	✓	03-May-2022	08-Jun-2022	✓
EP231B: Perfluoroalkyl Carboxylic Acids								
HDPE Soil Jar (EP231X) 0229_SD121_220422, 0229_SD242_220422	0229_SD132_220422,	22-Apr-2022	29-Apr-2022	19-Oct-2022	✓	03-May-2022	08-Jun-2022	✓
EP231C: Perfluoroalkyl Sulfonamides								
HDPE Soil Jar (EP231X) 0229_SD121_220422, 0229_SD242_220422	0229_SD132_220422,	22-Apr-2022	29-Apr-2022	19-Oct-2022	✓	03-May-2022	08-Jun-2022	✓
EP231D: (n:2) Fluorotelomer Sulfonic Acids								
HDPE Soil Jar (EP231X) 0229_SD121_220422, 0229_SD242_220422	0229_SD132_220422,	22-Apr-2022	29-Apr-2022	19-Oct-2022	✓	03-May-2022	08-Jun-2022	✓
EP231P: PFAS Sums								
HDPE Soil Jar (EP231X) 0229_SD121_220422, 0229_SD242_220422	0229_SD132_220422,	22-Apr-2022	29-Apr-2022	19-Oct-2022	✓	03-May-2022	08-Jun-2022	✓

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	
EP231A: Perfluoroalkyl Sulfonic Acids								
HDPE (no PTFE) (EP231X) 0229_MW217_220422, 0229_SW133_220422, 0229_SW130_220422, 0229_QC150_220422, 0229_SW126_220422, 0229_QC550_220422	0229_SW120_220422, 0229_SW134_220422, 0229_SW129_220422, 0229_SW128_220422, 0229_QC350_220422	22-Apr-2022	03-May-2022	19-Oct-2022	✓	03-May-2022	19-Oct-2022	✓
HDPE (no PTFE) (EP231X) 0229_SW110_220426,	0229_QC351_220426	26-Apr-2022	05-May-2022	23-Oct-2022	✓	05-May-2022	23-Oct-2022	✓
EP231B: Perfluoroalkyl Carboxylic Acids								
HDPE (no PTFE) (EP231X) 0229_MW217_220422, 0229_SW133_220422, 0229_SW130_220422, 0229_QC150_220422, 0229_SW126_220422, 0229_QC550_220422	0229_SW120_220422, 0229_SW134_220422, 0229_SW129_220422, 0229_SW128_220422, 0229_QC350_220422	22-Apr-2022	03-May-2022	19-Oct-2022	✓	03-May-2022	19-Oct-2022	✓
HDPE (no PTFE) (EP231X) 0229_SW110_220426,	0229_QC351_220426	26-Apr-2022	05-May-2022	23-Oct-2022	✓	05-May-2022	23-Oct-2022	✓
EP231C: Perfluoroalkyl Sulfonamides								
HDPE (no PTFE) (EP231X) 0229_MW217_220422, 0229_SW133_220422, 0229_SW130_220422, 0229_QC150_220422, 0229_SW126_220422, 0229_QC550_220422	0229_SW120_220422, 0229_SW134_220422, 0229_SW129_220422, 0229_SW128_220422, 0229_QC350_220422	22-Apr-2022	03-May-2022	19-Oct-2022	✓	03-May-2022	19-Oct-2022	✓
HDPE (no PTFE) (EP231X) 0229_SW110_220426,	0229_QC351_220426	26-Apr-2022	05-May-2022	23-Oct-2022	✓	05-May-2022	23-Oct-2022	✓
EP231D: (n:2) Fluorotelomer Sulfonic Acids								
HDPE (no PTFE) (EP231X) 0229_MW217_220422, 0229_SW133_220422, 0229_SW130_220422, 0229_QC150_220422, 0229_SW126_220422, 0229_QC550_220422	0229_SW120_220422, 0229_SW134_220422, 0229_SW129_220422, 0229_SW128_220422, 0229_QC350_220422	22-Apr-2022	03-May-2022	19-Oct-2022	✓	03-May-2022	19-Oct-2022	✓
HDPE (no PTFE) (EP231X) 0229_SW110_220426,	0229_QC351_220426	26-Apr-2022	05-May-2022	23-Oct-2022	✓	05-May-2022	23-Oct-2022	✓



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)								
0229_MW217_220422,	0229_SW120_220422,	22-Apr-2022	03-May-2022	19-Oct-2022	✓	03-May-2022	19-Oct-2022	✓
0229_SW133_220422,	0229_SW134_220422,							
0229_SW130_220422,	0229_SW129_220422,							
0229_QC150_220422,	0229_SW128_220422,							
0229_SW126_220422,	0229_QC350_220422,							
0229_QC550_220422								
HDPE (no PTFE) (EP231X)								
0229_SW110_220426,	0229_QC351_220426	26-Apr-2022	05-May-2022	23-Oct-2022	✓	05-May-2022	23-Oct-2022	✓



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	Method	Count		Rate (%)			Quality Control Specification
		QC	Regular	Actual	Expected	Evaluation	
Analytical Methods							
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	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

Matrix: WATER

Evaluation: ✖ = Quality Control frequency not within specification ; ✔ = Quality Control frequency within specification.

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



Brief Method Summaries

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

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



SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : ET2202340

Client	: AECOM AUSTRALIA PTY LTD	Laboratory	: Environmental Division Townsville
Contact	: [REDACTED]	Contact	: [REDACTED]
Address	: PO BOX 1307 FORTITUDE VALLEY QLD, AUSTRALIA 4006	Address	: 13 Carlton Street, Kirwan Townsville QLD Australia 4815
E-mail	: [REDACTED]	E-mail	: [REDACTED]
Telephone	: ----	Telephone	: [REDACTED]
Facsimile	: ----	Facsimile	: [REDACTED]
Project	: QLD_0229_PFASOMP_20	Page	: 1 of 3
Order number	:	Quote number	: ET2021AECOMAU0001 (TV/007/21 v2 - Compass)
C-O-C number	: 36676	QC Level	: NEPM 2013 B3 & ALS QC Standard
Site	: QLD_0229		
Sampler	: [REDACTED]		

Dates

Date Samples Received	: 27-Apr-2022 08:50	Issue Date	: 28-Apr-2022
Client Requested Due Date	: 06-May-2022	Scheduled Reporting Date	: 06-May-2022

Delivery Details

Mode of Delivery	: Carrier	Security Seal	: Intact.
No. of coolers/boxes	: 1	Temperature	: 3.3°C - Ice present
Receipt Detail	: MEDIUM ESKY	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
- **28/04/2022: SRN has been resent to acknowledge additional of PFAS to samples -015 & -016. For any further information regarding these adjustments please contact client services at [REDACTED]**
- Discounted Package Prices apply only when specific ALS Group Codes ('W', 'S', 'NT' suites) are referenced on COCs.
- Please direct any turn around / technical queries to the laboratory contact designated above.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months ± 1 week) from receipt of samples.
- All remaining analysis will be conducted by ALS Environmental, Brisbane, NATA accreditation no. 825, Site No. 818.
- 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.
- **Please refer to the Proactive Holding Time Report table below which summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory. The laboratory will process these samples unless instructions are received from you indicating you do not wish to proceed. The absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.**



Sample 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)
ET2202340-011	22-Apr-2022 15:57	0229_SD121_220422	✓	✓
ET2202340-012	22-Apr-2022 16:06	0229_SD132_220422	✓	✓
ET2202340-013	22-Apr-2022 16:25	0229_SD242_220422	✓	✓

Matrix: **WATER**

Laboratory sample ID	Sampling date / time	Sample ID	WATER - EP231X PFAS - Full Suite (28 analytes)
ET2202340-001	22-Apr-2022 13:34	0229_MW217_220422	✓
ET2202340-002	22-Apr-2022 14:09	0229_SW120_220422	✓
ET2202340-003	22-Apr-2022 14:26	0229_SW133_220422	✓
ET2202340-004	22-Apr-2022 14:36	0229_SW134_220422	✓
ET2202340-005	22-Apr-2022 14:49	0229_SW130_220422	✓
ET2202340-006	22-Apr-2022 15:07	0229_SW129_220422	✓
ET2202340-007	22-Apr-2022 15:07	0229_QC150_220422	✓
ET2202340-008	22-Apr-2022 15:18	0229_SW128_220422	✓
ET2202340-009	22-Apr-2022 15:32	0229_SW126_220422	✓
ET2202340-010	22-Apr-2022 15:38	0229_QC350_220422	✓
ET2202340-014	22-Apr-2022 08:00	0229_QC550_220422	✓
ET2202340-015	26-Apr-2022 10:01	0229_SW110_220426	✓
ET2202340-016	26-Apr-2022 10:02	0229_QC351_220426	✓

Proactive Holding Time Report

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



Requested Deliverables

ACCOUNTS PAYABLE

- A4 - AU Tax Invoice (INV)	Email	[REDACTED]
[REDACTED]		
- *AU Certificate of Analysis - NATA (COA)	Email	[REDACTED]
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	[REDACTED]
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	[REDACTED]
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)	Email	[REDACTED]
- A4 - AU Tax Invoice (INV)	Email	[REDACTED]
- Chain of Custody (CoC) (COC)	Email	[REDACTED]
- EDI Format - ENMRG (ENMRG)	Email	[REDACTED]
- EDI Format - ESDAT (ESDAT)	Email	[REDACTED]
[REDACTED]		
- EDI Format - ESDAT (ESDAT)	Email	[REDACTED]
[REDACTED]		
- *AU Certificate of Analysis - NATA (COA)	Email	[REDACTED]
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	[REDACTED]
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	[REDACTED]
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)	Email	[REDACTED]
- A4 - AU Tax Invoice (INV)	Email	[REDACTED]
- Chain of Custody (CoC) (COC)	Email	[REDACTED]
- EDI Format - EQUIS V5 AECOM (EQUIS_V5_AECOM)	Email	[REDACTED]
- EDI Format - ESDAT (ESDAT)	Email	[REDACTED]
[REDACTED]		
- *AU Certificate of Analysis - NATA (COA)	Email	[REDACTED]
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	[REDACTED]
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	[REDACTED]
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)	Email	[REDACTED]
- Chain of Custody (CoC) (COC)	Email	[REDACTED]
- EDI Format - ENMRG (ENMRG)	Email	[REDACTED]
- EDI Format - ESDAT (ESDAT)	Email	[REDACTED]



REPORT OF ANALYSIS

Client : AECOM AUSTRALIA PTY LTD LEVEL 8 540 WICKHAM STREET	Job No. : AECO06/220309
Attention :	Quote No. : QT-02018
Project Name : QLD_0229_PFASOMP_20	Order No. : 60612487_3_1
Your Client Services Manager : [REDACTED]	Date Received : 9-MAR-2022
	Sampled By : CLIENT
	Phone : [REDACTED]

Lab Reg No.	Sample Ref	Sample Description
N22/004077	0229_QC205_220302	SOIL 02/03/22 1200
N22/004078	0229_QC201_220228	SOIL 28/02/22 1020
N22/004079	0229_QC203_220301	SOIL 01/03/22 1245

Lab Reg No.		N22/004077	N22/004078	N22/004079		
Date Sampled		02-MAR-2022	28-FEB-2022	01-MAR-2022		
	Units					Method
PFAS (per-and poly-fluoroalkyl substances)						
PFBA (375-22-4)	mg/kg	<0.002	<0.002	<0.002		NR70
PFPeA (2706-90-3)	mg/kg	<0.002	<0.002	<0.002		NR70
PFHxA (307-24-4)	mg/kg	<0.001	<0.001	<0.001		NR70
PFHpA (375-85-9)	mg/kg	<0.001	<0.001	<0.001		NR70
PFOA (335-67-1)	mg/kg	<0.001	<0.001	<0.001		NR70
PFNA (375-95-1)	mg/kg	<0.001	<0.001	<0.001		NR70
PFDA (335-76-2)	mg/kg	<0.001	<0.001	<0.001		NR70
PFUdA (2058-94-8)	mg/kg	<0.002	<0.002	<0.002		NR70
PFDoA (307-55-1)	mg/kg	<0.002	<0.002	<0.002		NR70
PFTrDA (72629-94-8)	mg/kg	<0.002	<0.002	<0.002		NR70
PFTeDA (376-06-7)	mg/kg	<0.002	<0.002	<0.002		NR70
PFHxDA (67905-19-5)	mg/kg	<0.002	<0.002	<0.002		NR70
PFODA (16517-11-6)	mg/kg	<0.005	<0.005	<0.005		NR70
FOUEA (70887-84-2)	mg/kg	<0.001	<0.001	<0.001		NR70
PFBS (375-73-5)	mg/kg	<0.001	<0.001	<0.001		NR70
PFPeS (2706-91-4)	mg/kg	<0.001	<0.001	<0.001		NR70
PFHxS (355-46-4)	mg/kg	<0.001	<0.001	0.0100		NR70
PFHpS (375-92-8)	mg/kg	<0.001	<0.001	0.0013		NR70
PFOS (1763-23-1)	mg/kg	<0.002	<0.002	0.087		NR70
PFNS (68259-12-1)	mg/kg	<0.001	<0.001	<0.001		NR70
PFDS (335-77-3)	mg/kg	<0.001	<0.001	<0.001		NR70
PFOSA (754-91-6)	mg/kg	<0.001	<0.001	<0.001		NR70
N-MeFOSA (31506-32-8)	mg/kg	<0.002	<0.002	<0.002		NR70
N-EtFOSA (4151-50-2)	mg/kg	<0.002	<0.002	<0.002		NR70
N-MeFOSAA (2355-31-9)	mg/kg	<0.002	<0.002	<0.002		NR70
N-EtFOSAA(2991-50-6)	mg/kg	<0.002	<0.002	<0.002		NR70
N-MeFOSE (24448-09-7)	mg/kg	<0.005	<0.005	<0.005		NR70
N-EtFOSE (1691-99-2)	mg/kg	<0.005	<0.005	<0.005		NR70

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Lab Reg No.		N22/004077	N22/004078	N22/004079		
Date Sampled		02-MAR-2022	28-FEB-2022	01-MAR-2022		
	Units					Method
PFAS (per-and poly-fluoroalkyl substances)						
4:2 FTS (757124-72-4)	mg/kg	<0.001	<0.001	<0.001		NR70
6:2 FTS (27619-97-2)	mg/kg	<0.001	<0.001	<0.001		NR70
8:2 FTS (39108-34-4)	mg/kg	<0.001	<0.001	<0.001		NR70
10:2 FTS (120226-60-0)	mg/kg	<0.002	<0.002	<0.002		NR70
8:2 diPAP (678-41-1)	mg/kg	<0.002	<0.002	<0.002		NR70
PFBA (Surrogate Recovery)	%	120	122	130		NR70
PFPeA (Surrogate Recovery)	%	117	117	125		NR70
PFHxA (Surrogate Recovery)	%	116	131	140		NR70
PFHpA (Surrogate Recovery)	%	110	114	133		NR70
PFOA (Surrogate Recovery)	%	132	131	144		NR70
PFNA (Surrogate Recovery)	%	77	99	207		NR70
PFDA (Surrogate Recovery)	%	108	81	241		NR70
PFUdA (Surrogate Recovery)	%	47	233	185		NR70
PFDoA (Surrogate Recovery)	%	113	33	228		NR70
PFTeDA (Surrogate Recovery)	%	31	133	81		NR70
PFHxDA (Surrogate Recovery)	%	210	248	84		NR70
FOUEA (Surrogate Recovery)	%	59	73	101		NR70
PFBS (Surrogate Recovery)	%	115	116	131		NR70
PFHxS (Surrogate Recovery)	%	119	128	129		NR70
PFOS (Surrogate Recovery)	%	115	117	117		NR70
PFOSA (Surrogate Recovery)	%	92	121	146		NR70
N-MeFOSA (Surrogate Recovery)	%	120	116	106		NR70
N-EtFOSA (Surrogate Recovery)	%	102	104	97		NR70
N-MeFOSAA (Surrogate Recovery)	%	81	107	134		NR70
N-EtFOSAA (Surrogate Recovery)	%	84	119	187		NR70
N-MeFOSE (Surrogate Recovery)	%	105	132	323		NR70
N-EtFOSE (Surrogate Recovery)	%	208	151	203		NR70
4:2 FTS (Surrogate Recovery)	%	117	120	176		NR70
6:2 FTS (Surrogate Recovery)	%	110	111	135		NR70
8:2 FTS (Surrogate Recovery)	%	83	119	220		NR70
8:2 diPAP (Surrogate Recovery)	%	72	91	141		NR70
Dates						
Date extracted		14-MAR-2022	14-MAR-2022	14-MAR-2022		
Date analysed		14-MAR-2022	14-MAR-2022	14-MAR-2022		

N22/004077
to
N22/004079

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

Selected PFAS surrogate recoveries are biased due to matrix effects.
High PFAS surrogate recoveries accepted - results corrected for recovery.
Surrogate recoveries low for selected analytes - PFAS LORs not raised since S/N > 10.

Organics - NSW
Accreditation No. 198

16-MAR-2022

Lab Reg No.		N22/004077	N22/004078	N22/004079		
Date Sampled		02-MAR-2022	28-FEB-2022	01-MAR-2022		
	Units					Method
Trace Elements						
Total Solids	%	75.4	81.6	48.9		NT2_49
Dates						
Date extracted		9-MAR-2022	9-MAR-2022	9-MAR-2022		
Date analysed		10-MAR-2022	10-MAR-2022	10-MAR-2022		

Inorganics - NSW
Accreditation No. 198

16-MAR-2022

All results are expressed on a dry weight basis.

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Client : AECOM AUSTRALIA PTY LTD LEVEL 8 540 WICKHAM STREET Attention : Project Name : QLD_0229_PFASOMP_20 Your Client Services Manager : ██████████	Job No. : AECO06/220309 Quote No. : QT-02018 Order No. : 60612487_3_1 Date Received : 09-MAR-2022 Sampled By : CLIENT Phone : ██████████
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Lab Reg No.	Sample Ref	Sample Description
N22/004080	0229_QC207_220303	WATER 03/03/22 1228
N22/004081	0229_QC200_220228	WATER 28/02/22 1020
N22/004082	0229_QC204_220302	WATER 02/03/22 1200
N22/004083	0229_QC202_220301	WATER 01/03/22 1254

Lab Reg No.	Date Sampled	Units	N22/004080	N22/004081	N22/004082	N22/004083	Method
			03-MAR-2022	28-FEB-2022	02-MAR-2022	01-MAR-2022	
PFAS (per-and poly-fluoroalkyl substances)							
PFBA (375-22-4)	ug/L	<0.05	<0.05	<0.05	<0.05	<0.05	NR70
PFPeA (2706-90-3)	ug/L	<0.02	<0.02	<0.02	<0.02	<0.02	NR70
PFHxA (307-24-4)	ug/L	<0.01	<0.01	0.025	0.080	NR70	
PFHpA (375-85-9)	ug/L	<0.01	<0.01	<0.01	<0.01	NR70	
PFOA (335-67-1)	ug/L	<0.01	<0.01	0.015	0.020	NR70	
PFNA (375-95-1)	ug/L	<0.01	<0.01	<0.01	<0.01	NR70	
PFDA (335-76-2)	ug/L	<0.01	<0.01	<0.01	<0.01	NR70	
PFUdA (2058-94-8)	ug/L	<0.01	<0.01	<0.01	<0.01	NR70	
PFDoA (307-55-1)	ug/L	<0.01	<0.01	<0.01	<0.01	NR70	
PFTrDA (72629-94-8)	ug/L	<0.02	<0.02	<0.02	<0.02	NR70	
PFTeDA (376-06-7)	ug/L	<0.02	<0.02	<0.02	<0.02	NR70	
PFHxDA (67905-19-5)	ug/L	<0.02	<0.02	<0.02	<0.02	NR70	
PFODA (16517-11-6)	ug/L	<0.05	<0.05	<0.05	<0.05	NR70	
FOUEA (70887-84-2)	ug/L	<0.01	<0.01	<0.01	<0.01	NR70	
PFDS (335-77-3)	ug/L	<0.01	<0.01	<0.01	<0.01	NR70	
PFPeS (2706-91-4)	ug/L	0.074	<0.01	0.025	0.039	NR70	
PFHxS (355-46-4)	ug/L	0.33	<0.01	0.23	0.34	NR70	
PFHpS (375-92-8)	ug/L	<0.01	<0.01	<0.01	0.013	NR70	
PFOS (1763-23-1)	ug/L	<0.02	<0.02	0.25	0.59	NR70	
PFNS (68259-12-1)	ug/L	<0.01	<0.01	<0.01	<0.01	NR70	
PFBS (375-73-5)	ug/L	0.11	<0.01	0.054	0.054	NR70	
PFOSA (754-91-6)	ug/L	<0.01	<0.01	<0.01	<0.01	NR70	
N-MeFOSA (31506-32-8)	ug/L	<0.02	<0.02	<0.02	<0.02	NR70	
N-EtFOSA (4151-50-2)	ug/L	<0.02	<0.02	<0.02	<0.02	NR70	
N-MeFOSAA (2355-31-9)	ug/L	<0.01	<0.01	<0.01	<0.01	NR70	
N-EtFOSAA(2991-50-6)	ug/L	<0.01	<0.01	<0.01	<0.01	NR70	
N-MeFOSE (24448-09-7)	ug/L	<0.05	<0.05	<0.05	<0.05	NR70	

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Lab Reg No.			N22/004080	N22/004081	N22/004082	N22/004083	
Date Sampled			03-MAR-2022	28-FEB-2022	02-MAR-2022	01-MAR-2022	
		Units					Method
PFAS (per-and poly-fluoroalkyl substances)							
N-EtFOSE (1691-99-2)	ug/L	<0.05	<0.05	<0.05	<0.05	<0.05	NR70
4:2 FTS (757124-72-4)	ug/L	<0.01	<0.01	<0.01	<0.01	<0.01	NR70
6:2 FTS (27619-97-2)	ug/L	<0.01	<0.01	<0.01	<0.01	<0.01	NR70
8:2 FTS (39108-34-4)	ug/L	<0.01	<0.01	<0.01	<0.01	<0.01	NR70
10:2 FTS (120226-60-0)	ug/L	<0.01	<0.01	<0.01	<0.01	<0.01	NR70
8:2 diPAP (678-41-1)	ug/L	<0.02	<0.02	<0.02	<0.02	<0.02	NR70
PFBA (Surrogate Recovery)	%	101	109	111	109	109	NR70
PFPeA (Surrogate Recovery)	%	117	129	129	132	132	NR70
PFHxA (Surrogate Recovery)	%	81	89	105	120	120	NR70
PFHpA (Surrogate Recovery)	%	82	88	94	118	118	NR70
PFOA (Surrogate Recovery)	%	73	110	85	143	143	NR70
PFNA (Surrogate Recovery)	%	93	63	42	105	105	NR70
PFDA (Surrogate Recovery)	%	118	42	56	72	72	NR70
PFUdA (Surrogate Recovery)	%	177	43	44	138	138	NR70
PFDoA (Surrogate Recovery)	%	125	37	119	48	48	NR70
PFTeDA (Surrogate Recovery)	%	76	44	93	72	72	NR70
PFHxDA (Surrogate Recovery)	%	53	17	28	197	197	NR70
FOUEA (Surrogate Recovery)	%	56	75	83	91	91	NR70
PFBS (Surrogate Recovery)	%	68	86	98	120	120	NR70
PFHxS (Surrogate Recovery)	%	71	92	106	132	132	NR70
PFOS (Surrogate Recovery)	%	89	103	103	105	105	NR70
PFOSA (Surrogate Recovery)	%	73	50	69	116	116	NR70
N-MeFOSA (Surrogate Recovery)	%	39	56	50	73	73	NR70
N-EtFOSA (Surrogate Recovery)	%	35	45	42	55	55	NR70
N-MeFOSAA (Surrogate Recovery)	%	73	48	73	99	99	NR70
N-EtFOSAA (Surrogate Recovery)	%	69	46	62	95	95	NR70
N-MeFOSE (Surrogate Recovery)	%	35	63	60	92	92	NR70
N-EtFOSE (Surrogate Recovery)	%	52	111	55	142	142	NR70
4:2 FTS (Surrogate Recovery)	%	89	120	153	200	200	NR70
6:2 FTS (Surrogate Recovery)	%	66	94	105	140	140	NR70
8:2 FTS (Surrogate Recovery)	%	76	67	131	132	132	NR70
8:2 diPAP (Surrogate Recovery)	%	63	46	60	107	107	NR70
Dates							
Date extracted		14-MAR-2022	14-MAR-2022	14-MAR-2022	14-MAR-2022	14-MAR-2022	
Date analysed		14-MAR-2022	14-MAR-2022	14-MAR-2022	14-MAR-2022	14-MAR-2022	

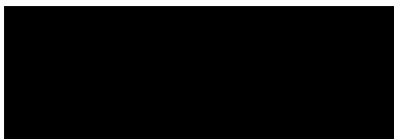
N22/004080
to
N22/004086

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

Selected PFAS surrogate recoveries are biased due to matrix effects.
High PFAS surrogate recoveries accepted - results corrected for recovery.
Surrogate recoveries low for selected analytes - PFAS LORs not raised since S/N > 10.



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Report No. RN1345718

Client : AECOM AUSTRALIA PTY LTD LEVEL 8 540 WICKHAM STREET Attention : Project Name : QLD_0229_PFASOMP_20 Your Client Services Manager : ██████████	Job No. : AECO06/220309 Quote No. : QT-02018 Order No. : 60612487_3_1 Date Received : 09-MAR-2022 Sampled By : CLIENT Phone : ██████████
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Lab Reg No.	Sample Ref	Sample Description
N22/004084	0229_QC209_220303	WATER 03/03/22 3:53
N22/004085	0229_QC206_220303	WATER 03/03/22 11:14
N22/004086	0229_QC208_220303	WATER 03/03/22 2:40

Lab Reg No.	Date Sampled	Units	N22/004084	N22/004085	N22/004086	Method
			03-MAR-2022	03-MAR-2022	03-MAR-2022	
PFAS (per-and poly-fluoroalkyl substances)						
PFBA (375-22-4)	ug/L	0.12	<0.05	0.20		NR70
PFPeA (2706-90-3)	ug/L	0.11	<0.02	0.26		NR70
PFHxA (307-24-4)	ug/L	0.30	<0.01	1.2		NR70
PFHpA (375-85-9)	ug/L	0.086	<0.01	0.17		NR70
PFOA (335-67-1)	ug/L	0.12	<0.01	0.30		NR70
PFNA (375-95-1)	ug/L	<0.01	<0.01	0.097		NR70
PFDA (335-76-2)	ug/L	<0.01	<0.01	<0.01		NR70
PFUdA (2058-94-8)	ug/L	<0.01	<0.01	<0.01		NR70
PFDoA (307-55-1)	ug/L	<0.01	<0.01	<0.01		NR70
PFTrDA (72629-94-8)	ug/L	<0.02	<0.02	<0.02		NR70
PFTeDA (376-06-7)	ug/L	<0.02	<0.02	<0.02		NR70
PFHxDA (67905-19-5)	ug/L	<0.02	<0.02	<0.02		NR70
PFODA (16517-11-6)	ug/L	<0.05	<0.05	<0.05		NR70
FOUEA (70887-84-2)	ug/L	<0.01	<0.01	<0.01		NR70
PFDS (335-77-3)	ug/L	<0.01	<0.01	<0.01		NR70
PFPeS (2706-91-4)	ug/L	0.37	<0.01	0.69		NR70
PFHxS (355-46-4)	ug/L	2.2	0.017	3.8		NR70
PFHpS (375-92-8)	ug/L	0.14	<0.01	0.33		NR70
PFOS (1763-23-1)	ug/L	1.5	0.043	4.3		NR70
PFNS (68259-12-1)	ug/L	<0.01	<0.01	<0.01		NR70
PFBS (375-73-5)	ug/L	0.47	0.015	0.81		NR70
PFOSA (754-91-6)	ug/L	<0.01	<0.01	<0.01		NR70
N-MeFOSA (31506-32-8)	ug/L	<0.02	<0.02	<0.02		NR70
N-EtFOSA (4151-50-2)	ug/L	<0.02	<0.02	<0.02		NR70
N-MeFOSAA (2355-31-9)	ug/L	<0.01	<0.01	<0.01		NR70
N-EtFOSAA(2991-50-6)	ug/L	<0.01	<0.01	<0.01		NR70
N-MeFOSE (24448-09-7)	ug/L	<0.05	<0.05	<0.05		NR70
N-EtFOSE (1691-99-2)	ug/L	<0.05	<0.05	<0.05		NR70

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Lab Reg No.			N22/004084	N22/004085	N22/004086		
Date Sampled			03-MAR-2022	03-MAR-2022	03-MAR-2022		
		Units					Method
PFAS (per-and poly-fluoroalkyl substances)							
4:2 FTS (757124-72-4)	ug/L	<0.01	<0.01	<0.01	<0.01		NR70
6:2 FTS (27619-97-2)	ug/L	0.015	0.035	0.014	0.014		NR70
8:2 FTS (39108-34-4)	ug/L	<0.01	<0.01	<0.01	<0.01		NR70
10:2 FTS (120226-60-0)	ug/L	<0.01	<0.01	<0.01	<0.01		NR70
8:2 diPAP (678-41-1)	ug/L	<0.02	<0.02	<0.02	<0.02		NR70
PFBA (Surrogate Recovery)	%	111	112	112	112		NR70
PFPeA (Surrogate Recovery)	%	149	120	112	112		NR70
PFHxA (Surrogate Recovery)	%	102	118	95	95		NR70
PFHpA (Surrogate Recovery)	%	100	134	104	104		NR70
PFOA (Surrogate Recovery)	%	116	132	83	83		NR70
PFNA (Surrogate Recovery)	%	51	71	129	129		NR70
PFDA (Surrogate Recovery)	%	39	55	142	142		NR70
PFUdA (Surrogate Recovery)	%	22	80	181	181		NR70
PFDoA (Surrogate Recovery)	%	50	68	234	234		NR70
PFTeDA (Surrogate Recovery)	%	51	295	420	420		NR70
PFHxDA (Surrogate Recovery)	%	175	61	227	227		NR70
FOUEA (Surrogate Recovery)	%	94	102	78	78		NR70
PFBS (Surrogate Recovery)	%	104	123	88	88		NR70
PFHxS (Surrogate Recovery)	%	101	132	126	126		NR70
PFOS (Surrogate Recovery)	%	102	104	123	123		NR70
PFOSA (Surrogate Recovery)	%	38	82	149	149		NR70
N-MeFOSA (Surrogate Recovery)	%	64	80	60	60		NR70
N-EtFOSA (Surrogate Recovery)	%	57	67	52	52		NR70
N-MeFOSAA (Surrogate Recovery)	%	38	101	164	164		NR70
N-EtFOSAA (Surrogate Recovery)	%	37	112	165	165		NR70
N-MeFOSE (Surrogate Recovery)	%	55	97	135	135		NR70
N-EtFOSE (Surrogate Recovery)	%	130	101	95	95		NR70
4:2 FTS (Surrogate Recovery)	%	148	161	91	91		NR70
6:2 FTS (Surrogate Recovery)	%	96	117	91	91		NR70
8:2 FTS (Surrogate Recovery)	%	38	83	168	168		NR70
8:2 diPAP (Surrogate Recovery)	%	39	67	165	165		NR70
Dates							
Date extracted		14-MAR-2022	14-MAR-2022	14-MAR-2022	14-MAR-2022		
Date analysed		14-MAR-2022	14-MAR-2022	14-MAR-2022	14-MAR-2022		

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REPORT OF ANALYSIS

Client : AECOM AUSTRALIA PTY LTD LEVEL 8 540 WICKHAM STREET	Job No. : AECO06/220428
Attention : [REDACTED]	Quote No. : QT-02018
Project Name : 60612487_3.1	Order No. : 60612487_3_1
Your Client Services Manager : [REDACTED]	Date Received : 28-APR-2022
	Sampled By : CLIENT
	Phone : [REDACTED]

Lab Reg No.	Sample Ref	Sample Description
N22/007832	0229_QC250_220422	WATER 22.04.2022

Lab Reg No.	Units	N22/007832				Method
Date Sampled		22-APR-2022				
PFAS (per-and poly-fluoroalkyl substances)						
PFBA (375-22-4)	ug/L	<0.05				NR70
PFPeA (2706-90-3)	ug/L	<0.02				NR70
PFHxA (307-24-4)	ug/L	0.010				NR70
PFHpA (375-85-9)	ug/L	<0.01				NR70
PFOA (335-67-1)	ug/L	<0.01				NR70
PFNA (375-95-1)	ug/L	<0.01				NR70
PFDA (335-76-2)	ug/L	<0.01				NR70
PFUdA (2058-94-8)	ug/L	<0.01				NR70
PFDoA (307-55-1)	ug/L	<0.01				NR70
PFTrDA (72629-94-8)	ug/L	<0.02				NR70
PFTeDA (376-06-7)	ug/L	<0.02				NR70
PFHxDA (67905-19-5)	ug/L	<0.02				NR70
PFODA (16517-11-6)	ug/L	<0.05				NR70
FOUEA (70887-84-2)	ug/L	<0.01				NR70
PFDS (335-77-3)	ug/L	<0.01				NR70
PFPeS (2706-91-4)	ug/L	<0.01				NR70
PFHxS (355-46-4)	ug/L	0.051				NR70
PFHpS (375-92-8)	ug/L	<0.01				NR70
PFOS (1763-23-1)	ug/L	0.031				NR70
PFNS (68259-12-1)	ug/L	<0.01				NR70
PFBS (375-73-5)	ug/L	0.015				NR70
PFOSA (754-91-6)	ug/L	<0.01				NR70
N-MeFOSA (31506-32-8)	ug/L	<0.02				NR70
N-EtFOSA (4151-50-2)	ug/L	<0.02				NR70
N-MeFOSAA (2355-31-9)	ug/L	<0.01				NR70
N-EtFOSAA(2991-50-6)	ug/L	<0.01				NR70
N-MeFOSE (24448-09-7)	ug/L	<0.05				NR70
N-EtFOSE (1691-99-2)	ug/L	<0.05				NR70
4:2 FTS (757124-72-4)	ug/L	<0.01				NR70
6:2 FTS (27619-97-2)	ug/L	<0.01				NR70

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Lab Reg No.		N22/007832				
Date Sampled		22-APR-2022				
	Units					Method
PFAS (per-and poly-fluoroalkyl substances)						
8:2 FTS (39108-34-4)	ug/L	<0.01				NR70
10:2 FTS (120226-60-0)	ug/L	<0.01				NR70
8:2 diPAP (678-41-1)	ug/L	<0.02				NR70
PFBA (Surrogate Recovery)	%	103				NR70
PFPeA (Surrogate Recovery)	%	126				NR70
PFHxA (Surrogate Recovery)	%	104				NR70
PFHpA (Surrogate Recovery)	%	88				NR70
PFOA (Surrogate Recovery)	%	95				NR70
PFNA (Surrogate Recovery)	%	88				NR70
PFDA (Surrogate Recovery)	%	65				NR70
PFUdA (Surrogate Recovery)	%	65				NR70
PFDoA (Surrogate Recovery)	%	49				NR70
PFTeDA (Surrogate Recovery)	%	40				NR70
PFHxDA (Surrogate Recovery)	%	48				NR70
FOUEA (Surrogate Recovery)	%	69				NR70
PFBS (Surrogate Recovery)	%	93				NR70
PFHxS (Surrogate Recovery)	%	99				NR70
PFOS (Surrogate Recovery)	%	114				NR70
PFOSA (Surrogate Recovery)	%	62				NR70
N-MeFOSA (Surrogate Recovery)	%	59				NR70
N-EtFOSA (Surrogate Recovery)	%	49				NR70
N-MeFOSAA (Surrogate Recovery)	%	60				NR70
N-EtFOSAA (Surrogate Recovery)	%	58				NR70
N-MeFOSE (Surrogate Recovery)	%	61				NR70
N-EtFOSE (Surrogate Recovery)	%	68				NR70
4:2 FTS (Surrogate Recovery)	%	123				NR70
6:2 FTS (Surrogate Recovery)	%	106				NR70
8:2 FTS (Surrogate Recovery)	%	87				NR70
8:2 diPAP (Surrogate Recovery)	%	70				NR70
Dates						
Date extracted		2-MAY-2022				
Date analysed		2-MAY-2022				

N22/007832

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

Selected PFAS surrogate recoveries are biased due to matrix effects.δ

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Surrogate recoveries low for selected analytes - PFAS LORs not raised since S/N > 10.



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REPORT OF ANALYSIS

Client : AECOM AUSTRALIA PTY LTD LEVEL 8 540 WICKHAM STREET	Job No. : AECO06/220428
Attention : [REDACTED]	Quote No. : QT-02018
Project Name : QLD_0229_PFASOMP_20	Order No. : 60612487_3_1
Your Client Services Manager : [REDACTED]	Date Received : 28-APR-2022
	Sampled By : CLIENT
	Phone : [REDACTED]

Lab Reg No.	Sample Ref	Sample Description
N22/007832	0229_QC250_220422	WATER 22.04.2022

Lab Reg No.	Units	N22/007832				Method
Date Sampled		22-APR-2022				
PFAS (per-and poly-fluoroalkyl substances)						
PFBA (375-22-4)	ug/L	<0.05				NR70
PFPeA (2706-90-3)	ug/L	<0.02				NR70
PFHxA (307-24-4)	ug/L	0.010				NR70
PFHpA (375-85-9)	ug/L	<0.01				NR70
PFOA (335-67-1)	ug/L	<0.01				NR70
PFNA (375-95-1)	ug/L	<0.01				NR70
PFDA (335-76-2)	ug/L	<0.01				NR70
PFUdA (2058-94-8)	ug/L	<0.01				NR70
PFDoA (307-55-1)	ug/L	<0.01				NR70
PFTrDA (72629-94-8)	ug/L	<0.02				NR70
PFTeDA (376-06-7)	ug/L	<0.02				NR70
PFHxDA (67905-19-5)	ug/L	<0.02				NR70
PFODA (16517-11-6)	ug/L	<0.05				NR70
FOUEA (70887-84-2)	ug/L	<0.01				NR70
PFDS (335-77-3)	ug/L	<0.01				NR70
PFPeS (2706-91-4)	ug/L	<0.01				NR70
PFHxS (355-46-4)	ug/L	0.051				NR70
PFHpS (375-92-8)	ug/L	<0.01				NR70
PFOS (1763-23-1)	ug/L	0.031				NR70
PFNS (68259-12-1)	ug/L	<0.01				NR70
PFBS (375-73-5)	ug/L	0.015				NR70
PFOSA (754-91-6)	ug/L	<0.01				NR70
N-MeFOSA (31506-32-8)	ug/L	<0.02				NR70
N-EtFOSA (4151-50-2)	ug/L	<0.02				NR70
N-MeFOSAA (2355-31-9)	ug/L	<0.01				NR70
N-EtFOSAA(2991-50-6)	ug/L	<0.01				NR70
N-MeFOSE (24448-09-7)	ug/L	<0.05				NR70
N-EtFOSE (1691-99-2)	ug/L	<0.05				NR70
4:2 FTS (757124-72-4)	ug/L	<0.01				NR70
6:2 FTS (27619-97-2)	ug/L	<0.01				NR70

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Lab Reg No.		N22/007832				
Date Sampled		22-APR-2022				
	Units					Method
PFAS (per-and poly-fluoroalkyl substances)						
8:2 FTS (39108-34-4)	ug/L	<0.01				NR70
10:2 FTS (120226-60-0)	ug/L	<0.01				NR70
8:2 diPAP (678-41-1)	ug/L	<0.02				NR70
PFBA (Surrogate Recovery)	%	103				NR70
PFPeA (Surrogate Recovery)	%	126				NR70
PFHxA (Surrogate Recovery)	%	104				NR70
PFHpA (Surrogate Recovery)	%	88				NR70
PFOA (Surrogate Recovery)	%	95				NR70
PFNA (Surrogate Recovery)	%	88				NR70
PFDA (Surrogate Recovery)	%	65				NR70
PFUdA (Surrogate Recovery)	%	65				NR70
PFDoA (Surrogate Recovery)	%	49				NR70
PFTeDA (Surrogate Recovery)	%	40				NR70
PFHxDA (Surrogate Recovery)	%	48				NR70
FOUEA (Surrogate Recovery)	%	69				NR70
PFBS (Surrogate Recovery)	%	93				NR70
PFHxS (Surrogate Recovery)	%	99				NR70
PFOS (Surrogate Recovery)	%	114				NR70
PFOSA (Surrogate Recovery)	%	62				NR70
N-MeFOSA (Surrogate Recovery)	%	59				NR70
N-EtFOSA (Surrogate Recovery)	%	49				NR70
N-MeFOSAA (Surrogate Recovery)	%	60				NR70
N-EtFOSAA (Surrogate Recovery)	%	58				NR70
N-MeFOSE (Surrogate Recovery)	%	61				NR70
N-EtFOSE (Surrogate Recovery)	%	68				NR70
4:2 FTS (Surrogate Recovery)	%	123				NR70
6:2 FTS (Surrogate Recovery)	%	106				NR70
8:2 FTS (Surrogate Recovery)	%	87				NR70
8:2 diPAP (Surrogate Recovery)	%	70				NR70
Dates						
Date extracted		2-MAY-2022				
Date analysed		2-MAY-2022				

N22/007832

PFOS and PFHxS are quantified using a combined branched and linear standard, linear and branched isomers are totalled for reporting.

All results corrected for labelled surrogate recoveries.

Selected PFAS surrogate recoveries are biased due to matrix effects.δ

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Surrogate recoveries low for selected analytes - PFAS LORs not raised since S/N > 10.



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RN1350701

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QUALITY ASSURANCE REPORT

Client: SYDNEY WATER CORPORATION

NMI QA Report No: SYDN38/220309

Sample Matrix: Liquid

Analyte	Method	LOR	Blank	Sample Duplicates			Recoveries	
				Sample	Duplicate	RPD	LCS	Matrix Spike
		ug/L	ug/L	ug/L	ug/L	%	%	%
PFBA (375-22-4)	NR70	0.5	<0.5	NA	NA	NA	121	NA
PFPeA (2706-90-3)	NR70	0.2	<0.2	NA	NA	NA	121	NA
PFHxA (307-24-4)	NR70	0.1	<0.1	NA	NA	NA	104	NA
PFHpA (375-85-9)	NR70	0.1	<0.1	NA	NA	NA	101	NA
PFOA (335-67-1)	NR70	0.05	<0.05	NA	NA	NA	98	NA
PFNA (375-95-1)	NR70	0.1	<0.1	NA	NA	NA	82	NA
PFDA (335-76-2)	NR70	0.1	<0.1	NA	NA	NA	150	NA
PFUdA (2058-94-8)	NR70	0.1	<0.1	NA	NA	NA	145	NA
PFDoA (307-55-1)	NR70	0.1	<0.1	NA	NA	NA	150	NA
PFTTrDA (72629-94-8)	NR70	0.2	<0.2	NA	NA	NA	147	NA
PFTeDA (376-06-7)	NR70	0.2	<0.2	NA	NA	NA	128	NA
PFHxDA (67905-19-5)	NR70	0.2	<0.2	NA	NA	NA	55	NA
PFODA (16517-11-6)	NR70	0.5	<0.5	NA	NA	NA	99	NA
FOUEA (70887-84-2)	NR70	0.1	<0.1	NA	NA	NA	51	NA
PFBS (375-73-5)	NR70	0.1	<0.1	NA	NA	NA	119	NA
PFPeS (2706-91-4)	NR70	0.1	<0.1	NA	NA	NA	118	NA
PFHxS (355-46-4)	NR70	0.05	<0.05	NA	NA	NA	109	NA
PFHpS (375-92-8)	NR70	0.1	<0.1	NA	NA	NA	115	NA
PFOS (1763-23-1)	NR70	0.05	<0.05	NA	NA	NA	103	NA
PFNS (68259-12-1)	NR70	0.1	<0.1	NA	NA	NA	103	NA
PFDS (335-77-3)	NR70	0.1	<0.1	NA	NA	NA	105	NA
PFOSA (754-91-6)	NR70	0.1	<0.1	NA	NA	NA	107	NA
N-MeFOSA (31506-32-8)	NR70	0.2	<0.2	NA	NA	NA	130	NA
N-EtFOSA (4151-50-2)	NR70	0.2	<0.2	NA	NA	NA	149	NA
N-MeFOSAA (2355-31-9)	NR70	0.1	<0.1	NA	NA	NA	108	NA
N-EtFOSAA(2991-50-6)	NR70	0.1	<0.1	NA	NA	NA	102	NA
N-MeFOSE (24448-09-7)	NR70	0.5	<0.5	NA	NA	NA	84	NA
N-EtFOSE (1691-99-2)	NR70	0.5	<0.5	NA	NA	NA	144	NA
4:2 FTS (757124-72-4)	NR70	0.1	<0.1	NA	NA	NA	145	NA
6:2 FTS (27619-97-2)	NR70	0.1	<0.1	NA	NA	NA	109	NA
8:2 FTS (39108-34-4)	NR70	0.1	<0.1	NA	NA	NA	122	NA
10:2 FTS (120226-60-0)	NR70	0.1	<0.1	NA	NA	NA	114	NA
8:2 diPAP (678-41-1)	NR70	0.2	<0.2	NA	NA	NA	106	NA

Results expressed in percentage (%) or ug/L wherever appropriate.

Acceptable Spike recovery is 50-150%.

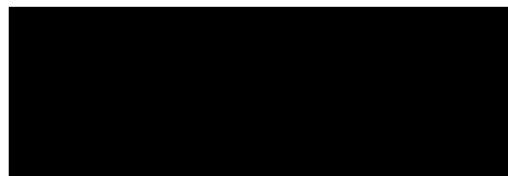
Maximum acceptable RPDs on spikes and duplicates is 40%.

'NA' = Not Applicable.

RPD= Relative Percentage Difference.

Signed:

Date:





SAMPLE RECEIPT NOTIFICATION

CUSTOMER DETAILS

Attention:
Customer: AECOM AUSTRALIA PTY LTD
Address: LEVEL 8
FORTITUDE VALLEY QLD 4006
Email: [REDACTED]
Telephone:
Fax:

LABORATORY DETAILS

Lab: National Measurement Institute
Contact: [REDACTED]
Address: 105 Delhi Road, North Ryde, NSW
NSW 2113
Email: [REDACTED]
Telephone: [REDACTED]
Fax:

SAMPLE DETAILS

NMI Job Name: AECO06/220309

Total No. of Samples: 10

LRNs	Estimated Report Date	Customer Sample ID	Lab Sample Description
N22/004077	16-MAR-2022	0229_QC205_220302	SOIL 02/03/22 1200
N22/004078	16-MAR-2022	0229_QC201_220228	SOIL 28/02/22 1020
N22/004079	16-MAR-2022	0229_QC203_220301	SOIL 01/03/22 1245
N22/004080	16-MAR-2022	0229_QC207_220303	WATER 03/03/22 1228
N22/004081	16-MAR-2022	0229_QC200_220228	WATER 28/02/22 1020
N22/004082	16-MAR-2022	0229_QC204_220302	WATER 02/03/22 1200
N22/004083	16-MAR-2022	0229_QC202_220301	WATER 01/03/22 1254
N22/004084	16-MAR-2022	0229_QC209_220303	WATER 03/03/22 3:53
N22/004085	16-MAR-2022	0229_QC206_220303	WATER 03/03/22 11:14
N22/004086	16-MAR-2022	0229_QC208_220303	WATER 03/03/22 2:40

SAMPLE RECEIVED CONDITION

Date samples received: 9-MAR-2022

Sample received in good order: Yes

NMI Quotation no. provided:

Client purchase order number: 60612487_3_1

Temperature of samples: Chilled

Comments: Updated

Mode of Delivery: Courier

Additional Terms and Conditions

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

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

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



Australian Government
National Measurement Institute

QUALITY ASSURANCE REPORT

Client: AECOM AUSTRALIA PTY LTD

NMI QA Report No: AECO06/220428

Sample Matrix: Liquid

Analyte	Method	LOR	Blank	Sample Duplicates			Recoveries	
				Sample	Duplicate	RPD	LCS	Matrix Spike
		ug/L	ug/L	ug/L	ug/L	%	%	%
PFBA (375-22-4)	NR70	0.05	< 0.05	NA	NA	NA	99	NA
PFPeA (2706-90-3)	NR70	0.02	< 0.02	NA	NA	NA	85	NA
PFFxA (307-24-4)	NR70	0.01	< 0.01	NA	NA	NA	93	NA
PFFpA (375-85-9)	NR70	0.01	< 0.01	NA	NA	NA	106	NA
PFOA (335-67-1)	NR70	0.01	< 0.01	NA	NA	NA	119	NA
PFNA (375-95-1)	NR70	0.01	< 0.01	NA	NA	NA	112	NA
PFDA (335-76-2)	NR70	0.01	< 0.01	NA	NA	NA	98	NA
PFDA (2058-94-8)	NR70	0.01	< 0.01	NA	NA	NA	102	NA
PFDaA (307-55-1)	NR70	0.01	< 0.01	NA	NA	NA	50	NA
PFTDA (72629-94-8)	NR70	0.02	< 0.02	NA	NA	NA	76	NA
PFTeDA (376-06-7)	NR70	0.02	< 0.02	NA	NA	NA	92	NA
PFFxDA (67905-19-5)	NR70	0.02	< 0.02	NA	NA	NA	133	NA
PFODA (16517-11-6)	NR70	0.05	< 0.05	NA	NA	NA	138	NA
FOEA (70887-84-2)	NR70	0.01	< 0.01	NA	NA	NA	103	NA
PFBS(375-73-5)	NR70	0.01	< 0.01	NA	NA	NA	99	NA
PFPeS(2706-91-4)	NR70	0.01	< 0.01	NA	NA	NA	100	NA
PFFxS(355-46-4)	NR70	0.01	< 0.01	NA	NA	NA	99	NA
PFFpS(375-92-8)	NR70	0.01	< 0.01	NA	NA	NA	98	NA
PFOS(1763-23-1)	NR70	0.02	< 0.02	NA	NA	NA	98	NA
PFNS(68259-12-1)	NR70	0.01	< 0.01	NA	NA	NA	100	NA
PFDS(335-77-3)	NR70	0.01	< 0.01	NA	NA	NA	98	NA
PFOSA (754-91-6)	NR70	0.01	< 0.01	NA	NA	NA	100	NA
N-MeFOSA (31506-32-8)	NR70	0.02	< 0.02	NA	NA	NA	97	NA
N-Et FOSA (4151-50-2)	NR70	0.02	< 0.02	NA	NA	NA	105	NA
N-MeFOSAA (2355-31-9)	NR70	0.01	< 0.01	NA	NA	NA	97	NA
N-Et FOSAA(2991-50-6)	NR70	0.01	< 0.01	NA	NA	NA	102	NA
N-MeFOSE (24448-09-7)	NR70	0.05	< 0.05	NA	NA	NA	93	NA
N-Et FOSE (1691-99-2)	NR70	0.05	< 0.05	NA	NA	NA	56	NA
4:2 FTS (757124-72-4)	NR70	0.01	< 0.01	NA	NA	NA	100	NA
6:2 FTS(27619-97-2)	NR70	0.01	< 0.01	NA	NA	NA	93	NA
8:2 FTS(39108-34-4)	NR70	0.01	< 0.01	NA	NA	NA	114	NA
10:2 FTS(120226-60-0)	NR70	0.01	< 0.01	NA	NA	NA	85	NA
8:2 diPAP (678-41-1)	NR70	0.02	< 0.02	NA	NA	NA	84	NA

Results expressed in percentage (%) or ug/L wherever appropriate.

Acceptable Spike recovery is 50-150%.

Maximum acceptable RPDs on spikes and duplicates is 40%.

'NA' = Not Applicable.

RPD= Relative Percentage Difference.

Signed:



Organics Manager, NMI-North Ryde
5/05/2022

Date:



SAMPLE RECEIPT NOTIFICATION

CUSTOMER DETAILS

Attention: [REDACTED]
Customer: AECOM AUSTRALIA PTY LTD
Address: LEVEL 8
FORTITUDE VALLEY QLD 4006
Email: [REDACTED]
Telephone:
Fax:

LABORATORY DETAILS

Lab: National Measurement Institute
Contact: [REDACTED]
Address: 105 Delhi Road, North Ryde, NSW
NSW 2113
Email: [REDACTED]
Telephone: [REDACTED]
Fax:

SAMPLE DETAILS

NMI Job Name: AECO06/220428
Total No. of Samples: 1

LRNs	Estimated Report Date	Customer Sample ID	Lab Sample Description
N22/007832	5-MAY-2022	0229_QC250_220422	WATER 22.04.2022

SAMPLE RECEIVED CONDITION

Date samples received: 28-APR-2022
Sample received in good order: Yes
NMI Quotation no. provided: QLD_0229_PFASOMP_20
Client purchase order number: 60612487_3_1
Temperature of samples: Chilled
Comments:
Mode of Delivery: Courier

Additional Terms and Conditions

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

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

The lodgement of an order or receipt of samples for NMI services referenced in this Sample Receipt Notification constitutes an acceptance of the current version of NMI Terms and Conditions or other applicable Terms referenced in the NMI Quotation.

NMI Terms and Conditions are available on the web at

<https://www.industry.gov.au/client-services/testing-and-analysis-services/chemical-and-biological-analysis-services-terms-and-conditions>

Appendix F

Calibration Certificates

ANZ

FQM - Water Quality Meter Calibration Record

Q4AN(EV)-410-FM1

Project Name:	PFAS OMP - LAVAKAEN	Project Number:	60612487-3.1
Project Location:	ROSS RIVER	Client:	DEPT OF DEFENCE
PM Name:	[REDACTED]	Fieldwork Staff Name:	[REDACTED]

This calibration record is intended to prompt fieldwork staff to calibrate water quality meter (WQM) daily before the start of fieldworks.

INSTRUMENT DETAILS

Supplier:	AECOM
Make and Model:	YSI Pro DSS
Serial Number:	18K102334

CALIBRATION

CALIBRATE WITH CALIBRATION SOLUTIONS

Date and Time:	08:20 28/2/22				
Parameter	Acidity		Conductivity	ORP	Dissolved Oxygen
Units	pH	pH	µS/cm	mV -ppm	ppm %
Calibration Standard Concentration:	7.00	4.01	2569	230.7	120
Calibration Reading:	7.02	4.01	25.3	25.2	28.0
Calibration Temperature:	24.7	24.9	2558	229.8	99.6

ONGOING CHECKS

BUMP TEST WITH CALIBRATION SOLUTION

CALIBRATION

Date and Time:	3/3/22 12:00				
Parameter	Acidity		Conductivity	ORP	Dissolved Oxygen
Units	pH	pH	µS/cm	mV -ppm	ppm %
Calibration Standard Concentration:	7.00	4.01	2911	218	989
Bump Test Reading:	7.09	4.17	1193009	213.4	98.5
Bump Test Temperature:	27.7	27.6	28.4	51	41.5

COMMENTS

Detail any equipment faults, minor maintenance performed, change of batteries or technical support provided.

Approval and Distribution

Each individual instrument has been inspected and calibrated daily and bump tested as required by fieldwork staff.

Distribution: Project Central File

[REDACTED]

3/3/22

989

ANZ

FQM - Water Quality Meter Calibration Record

Q4AN(EV)-410-FM1

Project Name:	PFAS OMP	Project Number:	60612487
Project Location:	LAVARACK	Client:	DEFENCE
PM Name:	[REDACTED]	Fieldwork Staff Name:	[REDACTED]

This calibration record is intended to prompt fieldwork staff to calibrate water quality meter (WQM) daily before the start of fieldworks.

INSTRUMENT DETAILS

Supplier:	AIRMET
Make and Model:	YSI PRO PLUS
Serial Number:	10H100317

CALIBRATION

CALIBRATE WITH CALIBRATION SOLUTIONS

Date and Time:	28/2/22 0930				
Parameter	Acidity		Conductivity	ORP	Dissolved Oxygen
Units	pH	pH	µS/cm	mV ppm	ppm %
Calibration Standard Concentration:	7.00	4.01	2707	235.0 235.0	100
Calibration Reading:	7.14	4.28	2854	243.3	103.2
Calibration Temperature:	23.7	23.4	23.7	23.2	20.9

ONGOING CHECKS

BUMP TEST WITH CALIBRATION SOLUTION

Date and Time:	1/3/22 0800				
Parameter	Acidity		Conductivity	ORP	Dissolved Oxygen
Units	pH	pH	µS/cm	ppm mV	ppm %
Calibration Standard Concentration:	7.00	4.01	2707	226.9	100
Bump Test Reading:	6.75	3.92	2673	232.3	66.4
Bump Test Temperature:	28.7	23.9	24.3	28.9	28.4

COMMENTS

Detail any equipment faults, minor maintenance performed, change of batteries or technical support provided.

[Empty space for comments]

Approval and Distribution

Each individual instrument has been inspected and calibrated daily and bump tested as required by fieldwork staff.

 Fieldwork Staff Signature

 Date

Distribution: Project Central File

ANZ

FQM - Water Quality Meter Calibration Record

Q4AN(EV)-410-FM1

Project Name:	PFAS OMB	Project Number:	60612487
Project Location:	LAVARACK	Client:	DEFENCE
PM Name:	[REDACTED]	Fieldwork Staff Name:	[REDACTED]

This calibration record is intended to prompt fieldwork staff to calibrate water quality meter (WQM) daily before the start of fieldworks.

INSTRUMENT DETAILS

Supplier:	ARMET
Make and Model:	YSI PRO DSS
Serial Number:	18K102334

CALIBRATION

CALIBRATE WITH CALIBRATION SOLUTIONS

Date and Time:	1/3/22 0800				
Parameter	Acidity		Conductivity	ORP	Dissolved Oxygen
Units	pH	pH	µS/cm	mV ppm	ppm %
Calibration Standard Concentration:	7.04	4.01	2865	225.1	100
Calibration Reading:	6.97	4.06	2354	218.2	102.1
Calibration Temperature:	28.6	26.8	26.9	29.6	29.9

ONGOING CHECKS

BUMP TEST WITH CALIBRATION SOLUTION

Date and Time:					
Parameter	Acidity		Conductivity	Dissolved Oxygen	
Units	pH	pH	µS/cm	ppm	ppm
Calibration Standard Concentration:					
Bump Test Reading:					
Bump Test Temperature:					

COMMENTS

Detail any equipment faults, minor maintenance performed, change of batteries or technical support provided.

Approval and Distribution

Each individual instrument has been inspected and calibrated daily and bump tested as required by fieldwork staff.

 _____ Distribution: Proj	_____ Date
--	---------------

ANZ

FQM - Water Quality Meter Calibration Record

Q4AN(EV)-410-FM1

Project Name:	PFAS OMP - LAVARACK	Project Number:	60612487-3.1
Project Location:	LAVARACK BARRACKS	Client:	DEPT OF DEFENCE
PM Name:	[REDACTED]	Fieldwork Staff Name:	[REDACTED]

This calibration record is intended to prompt fieldwork staff to calibrate water quality meter (WQM) daily before the start of fieldworks.

INSTRUMENT DETAILS

Supplier:	AECOM
Make and Model:	YSI ProDSS
Serial Number:	18K

CALIBRATION

CALIBRATE WITH CALIBRATION SOLUTIONS

Date and Time:	0825 2/3/22				
Parameter	Acidity		Conductivity	ORP	Dissolved Oxygen
Units	pH	pH	µS/cm	mV ppm	ppm %
Calibration Standard Concentration:	7.00	4.01	2865	227.3	100
Calibration Reading:	7.01	4.04	3128	229.1	95.9
Calibration Temperature:	24.8	25.3	27.3	27.9	30.3

ONGOING CHECKS

BUMP TEST WITH CALIBRATION SOLUTION

Date and Time:					
Parameter	Acidity		Conductivity	Dissolved Oxygen	
Units	pH	pH	µS/cm	ppm	ppm
Calibration Standard Concentration:					
Bump Test Reading:					
Bump Test Temperature:					

COMMENTS

Detail any equipment faults, minor maintenance performed, change of batteries or technical support provided.

Approval and Distribution

Each individual instrument has been inspected and calibrated daily and bump tested as required by fieldwork staff.

Fieldwork Staff Signature

Date

Distribution: Project Central File

ANZ

FQM - Water Quality Meter Calibration Record

Q4AN(EV)-410-FM1

Project Name:	DPAS AMP - LAVARACK	Project Number:	60612487-3.1
Project Location:	LAVARACK BARABACKS	Client:	DEPT of DEFENCE
PM Name:	[REDACTED]	Fieldwork Staff Name:	[REDACTED]

This calibration record is intended to prompt fieldwork staff to calibrate water quality meter (WQM) daily before the start of fieldworks.

INSTRUMENT DETAILS

Supplier:	AIRMET
Make and Model:	YSI ProPlus
Serial Number:	10M100314

CALIBRATION

CALIBRATE WITH CALIBRATION SOLUTIONS

Date and Time:	0715 2/3/22				
Parameter	Acidity		Conductivity	ORP	Dissolved Oxygen
Units	pH	pH	µS/cm	ppm mV	ppm
Calibration Standard Concentration:	7.00	4.01	2760	233.4	100
Calibration Reading:	7.15	4.30	2707	231.2	126.0
Calibration Temperature:	32.1	32.1	24.3	24.0	28.0

ONGOING CHECKS

BUMP TEST WITH CALIBRATION SOLUTION

Date and Time:					
Parameter	Acidity		Conductivity	Dissolved Oxygen	
Units	pH	pH	µS/cm	ppm	ppm
Calibration Standard Concentration:					
Bump Test Reading:					
Bump Test Temperature:					

COMMENTS

Detail any equipment faults, minor maintenance performed, change of batteries or technical support provided.

Approval and Distribution

Each individual instrument has been inspected and calibrated daily and bump tested as required by fieldwork staff.

2/3/22

Fieldwork Staff Signature

Date

Distribution: Project Central File

ANZ

FQM - Water Quality Meter Calibration Record

Q4AN(EV)-410-FM1

Project Name:	PFAS OMP	Project Number:	60612487
Project Location:	On/Off-busy (low)	Client:	Defence
PM Name:	[Redacted]	Fieldwork Staff Name:	[Redacted]

This calibration record is intended to prompt fieldwork staff to calibrate water quality meter (WQM) daily before the start of fieldworks.

INSTRUMENT DETAILS

Supplier:	YSI
Make and Model:	Pro-DSS
Serial Number:	18K102334

CALIBRATION

CALIBRATE WITH CALIBRATION SOLUTIONS

Date and Time:	4/3/2022 07:35				
Parameter	Acidity		Conductivity	Dissolved Oxygen (DO)	
Units	pH	pH	µS/cm	ORP ppm (mV)	ppm %
Calibration Standard Concentration:	7	4	2760	232.4	99.0
Calibration Reading:	6.78	3.64	2590	235.8	98.3
Calibration Temperature:	22.9	23.0	23.8	23.7	24.5

ONGOING CHECKS

BUMP TEST WITH CALIBRATION SOLUTION

Date and Time:					
Parameter	Acidity		Conductivity	Dissolved Oxygen	
Units	pH	pH	µS/cm	ppm	ppm
Calibration Standard Concentration:					
Bump Test Reading:					
Bump Test Temperature:					

COMMENTS

Detail any equipment faults, minor maintenance performed, change of batteries or technical support provided.

[Large empty box for comments]

Approval and Distribution

Each individual instrument has been inspected and calibrated daily and bump tested as required by fieldwork staff.

[Redacted Signature]

4/3/22

Fieldwork Staff Signature

Date

Distribution: Project Central File

Multi Parameter Water Meter



airmet

Air-Met Scientific Pty Ltd
1300 137 067

Instrument YSI Quatro Pro Plus
Serial No. 10H100314

Item	Test	Pass	Comments
Battery	Charge Condition	✓	
	Fuses	✓	
	Capacity	✓	
Switch/keypad	Operation	✓	
Display	Intensity	✓	
	Operation (segments)	✓	
Grill Filter	Condition	✓	
	Seal	✓	
PCB	Condition	✓	
Connectors	Condition	✓	
Sensor	1. pH	✓	
	2. mV	✓	
	3. EC	✓	
	4. D.O	✓	
	5. Temp	✓	
Alarms	Beeper		
	Settings		
Software	Version		
Data logger	Operation		
Download	Operation		
Other tests:			

Certificate of Calibration

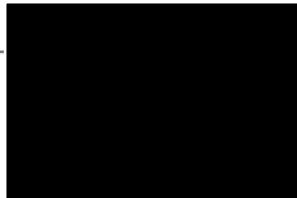
This is to certify that the above instrument has been calibrated to the following specifications:

Sensor	Serial no	Standard Solutions	Certified	Solution Bottle Number	Instrument Reading
1. pH 7.00		pH 7.02	NIST	373952	pH 7.02
2. pH 4.00		pH 4.00	NIST	368681	pH 4.00
3. mV		234.9mV	NIST	377347/374426	234.9mV
4. EC		2760uS	NIST	368682	2760uS
6. D.O		0 ppm	NIST	11171	0 ppm
7. Temp		22.3°C	NIST	Testo 901	22.3°C

Calibrated by:

Calibration date: 9/02/2022

Next calibration due: 9/08/2022



Oil / Water Interface Meter

Instrument **Interface Meter (30M)**
Serial No. **349173**



airmet

Air-Met Scientific Pty Ltd
1300 137 067

Item	Test	Pass	Comments
Battery	Compartment	✓	
	Capacity	✓	
Probe	Cleaned/Decon.	✓	
	Operation	✓	
Connectors	Condition	✓	
		✓	
Tape Check	Cleaned	✓	
	Checked for cuts	✓	
Instrument Test	At surface level	✓	

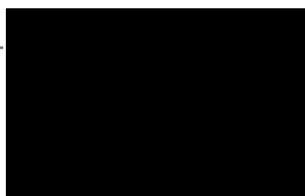
Certificate of Calibration

This is to certify that the above instrument has been cleaned and tested.

Calibrated by:

Calibration date: **22/02/2022**

Next calibration due: **25/05/2022**



Oil / Water Interface Meter

Instrument **Interface Meter (60M)**
Serial No. **312430**



airmet
 Air-Met Scientific Pty Ltd
 1300 137 067

Item	Test	Pass	Comments
Battery	Compartment	✓	
	Capacity	✓	
Probe	Cleaned/Decon.	✓	
	Operation	✓	
Connectors	Condition	✓	
		✓	
Tape Check	Cleaned	✓	
	Checked for cuts	✓	
Instrument Test	At surface level	✓	

Certificate of Calibration

This is to certify that the above instrument has been cleaned and tested.

Calibrated by: _____

Calibration date: 22/02/2022

Next calibration due: 22/05/2022

ANZ

FQM - Water Quality Meter Calibration Record

Q4AN(EV)-410-FM1

Project Name:	Lavarack OMP	Project Number:	60612437
Project Location:	Lavarack Barracks	Client:	De Sance
PM Name:	[Redacted]	Fieldwork Staff Name:	[Redacted]

This calibration record is intended to prompt fieldwork staff to calibrate water quality meter (WQM) daily before the start of fieldworks.

INSTRUMENT DETAILS

Supplier:	YSI
Make and Model:	Pro-DSS
Serial Number:	18K102334 / 18K102254

CALIBRATION

CALIBRATE WITH CALIBRATION SOLUTIONS

Date and Time:	18th Feb 2022 07:34				
Parameter	Acidity		Conductivity	ORP	Dissolved Oxygen
Units	pH	pH	µS/cm	mV ppm	ppm %
Calibration Standard Concentration:	4	7	2760	24 241.3	99.4
Calibration Reading:	3.94	6.16	25 29	243.3	99.8
Calibration Temperature:	23.1°C	23.3	23.2	17.0	24.8

ONGOING CHECKS

BUMP TEST WITH CALIBRATION SOLUTION

Date and Time:					
Parameter	Acidity		Conductivity	Dissolved Oxygen	
Units	pH	pH	µS/cm	ppm	ppm
Calibration Standard Concentration:					
Bump Test Reading:					
Bump Test Temperature:					

COMMENTS

Detail any equipment faults, minor maintenance performed, change of batteries or technical support provided.

Approval and Distribution

Each individual instrument has been inspected and calibrated daily and bump tested as required by fieldwork staff.

[Redacted Signature]
18/2/22

Fieldwork Staff Signature

Date

Distribution: Project Central File

Appendix G

Survey Data



Well ID	EASTING	NORTHING	Top of Casing RL	Ground RL
MW003	476816.10	7863923.36	14.23	13.51

Coordinates are MGA'94
Reduced Levels are AHD

Horizontal and Vertical Survey Datum Mark is PSM403 (Lavarack Survey Control Register)

DATUM MARK	EASTING	NORTHING	RL
PSM403	476463.456	7863788.43	14.922

Dry Season Sampling Factual Report, August to October 2022

PFAS OMP - Lavarack Barracks Townsville

05-Apr-2023

PFAS Ongoing Monitoring Program - Lavarack Barracks Townsville

Doc No. 60612487_RP78_20230405_LB Dry Season_Rev 2

Dry Season Sampling Factual Report, August to October 2022

PFAS OMP - Lavarack Barracks Townsville

Client: Department of Defence

ABN: 68 706 814 312

Prepared by

AECOM Australia Pty Ltd

Wulgurukaba of Gurambilbarra and Yunbenun, Bindal, Gugu Badhun and Nywaigi Country, Lvl 5, 7 Tomlins Street, South Townsville QLD 4810, PO
Box 5423, Townsville QLD 4810, Australia

T +61 7 4729 5500 www.aecom.com

ABN 20 093 846 925

05-Apr-2023

Job No.: 60612487

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

Quality Information

Document Dry Season Sampling Factual Report, August to October 2022

Ref 60612487_RP78_20230405

Date 05-Apr-2023

Prepared by [REDACTED]

Reviewed by [REDACTED]

Revision History

Rev	Revision Date	Details	Authorised	
			Name/Position	Signature
0	18-Nov-2022	Draft for Review	[REDACTED] Associate Director - Contaminated Land	
1	01-Mar-2023	Second Draft	[REDACTED] Associate Director - Contaminated Land	
2	05-Apr-2023	Final Issue	[REDACTED] Associate Director - Contaminated Land	[REDACTED]

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Abbreviations

Term	Description
6:2 FtS	6:2 Fluorotelomer Sulfonate
AECOM	AECOM Australia Pty Ltd
AFFF	Aqueous film forming foam
ALS	Australian Laboratory Services
ANZG	Australian and New Zealand Guidelines for Fresh and Marine Water Quality (2018)
ASC NEPM	National Environment Protection (Assessment of Site Contamination) Measure, as amended (2013)
DCMM	Defence Contamination Management Manual
Defence	Department of Defence
DO	Dissolved oxygen
EC	Electrical conductivity
FOSA	Perfluorooctane sulfonamide
HEPA	Heads of Environmental Protection Agencies
LOR	Limit of reporting
mBTOC	Metres below top of casing
mAHD	Metres Australian Height Datum
NEMP	National Environmental Management Plan
NHMRC	National Health and Medical Research Council
NMI	National Measurement Institute
OMP	Ongoing Monitoring Plan
ORP	Oxidation-reduction potential
PFAS	Per- and poly-fluoroalkyl substances
PFBA	Perfluorobutanoic acid
PFBS	Perfluorobutane sulfonic acid
PFDODA	Perfluorododecanoic acid
PFHpA	Perfluoroheptanoic acid
PFHpS	Perfluoroheptane sulfonic acid
PFHxA	Perfluorohexanoic acid
PFHxS	Perfluorohexane sulfonic acid
PFOA	Perfluorooctanoic acid
PFOS	Perfluorooctane sulfonate
PFNA	Perfluorononanoic acid
PFPeA	Perfluoropentanoic acid
PFPeS	Perfluoropentane sulfonic acid
PFTTrDA	Perfluorotridecanoic acid

Term	Description
PfUnDA	Perfluoroundecanoic acid
PMAP	PFAS Management Area Plan
QA/QC	Quality Assurance/Quality Control
QLD	Queensland
SAQP	Sampling Analysis Quality Plan
SD	Sediment
SW	Surface Water

List of Units

Unit	Definition	Unit	Definition
°C	Degrees Celsius	mg	Milligrams
L	Litre	mm	Millimetre
µS	Microsiemens	cm	Centimetre
kg	Kilogram	mV	Millivolts
m	Metre	µg	Micrograms

1.0 Introduction

1.1 General

AECOM Australia Pty Ltd (AECOM) was engaged by the Department of Defence (Defence) to implement the per- and poly-fluoroalkyl substances (PFAS) Ongoing Monitoring Plan (OMP) outlined in the PFAS Management Area Plan (PMAP) (Department of Defence, 2020) at Lavarack Barracks Townsville (the 'Base') located in the North Queensland Region. The location of the Base and the PFAS Source Areas are shown in **Figure 1** in **Appendix A**, PFAS Source Areas are identified and defined in the PMAP (Department of Defence, 2020). The OMP (Department of Defence, 2020) for Lavarack Barracks includes biannual groundwater, surface water, and sediment sampling events in October 2020, March/April 2021, August 2021, February to April 2022, August 2022, and February/March 2023.

These sampling events are scheduled to include:

- Groundwater sampling of 31 on-Base wells at Lavarack Barracks and nine off-Base wells in the suburbs of Annandale, Idalia, and Wulguru.
- Sediment sampling at 18 on-Base locations at Lavarack Barracks and 13 off-Base locations in the Ross River and waterways in Annandale and Idalia with co-located surface water sampling when water is present.

A sampling and analysis quality plan (SAQP Rev 6, AECOM, 2022) was prepared to provide details of the sampling event. Where deviations from the SAQP occurred, these are noted in this report.

This sampling event factual report has been prepared to report the results of the 2022 Dry Season Sampling Event, which was completed from 22 to 26 August, 3 September 2022 and 7 October 2022. This report specifically highlights first-time detections and/or new exceedances of human health or ecological screening criteria for perfluorooctane sulfonate (PFOS), PFOS + perfluorohexane sulfonic acid (PFHxS) and / or perfluorooctanoic acid (PFOA).

This report has been prepared in accordance with the *PFAS OMP Factual Report Guidance*, v0.2, May 2021 (Department of Defence, 2021).

1.2 Objectives

The objective of the OMP is to “*set out a program of ongoing sampling to assess changes in the nature and extent of PFAS concentration within the environment, where Defence’s historical use of legacy [Aqueous Film Forming Foam] AFFF has led to an identified potential risk to a receptor, or potential future risk to a receptor*” (Department of Defence, 2020).

The objectives of the SAQP (AECOM, 2022) are to:

- Document the proposed sampling in accordance with the OMP prepared as part of the PMAP (Department of Defence, 2020).
- Collect data that will enable Defence to maintain an up to date understanding of the distribution, concentration and transport of PFAS at the Base.

The data will assist in the timely identification of risks and inform Defence’s approach to the management of PFAS to protect human health and the environment, including updates and revisions to the PMAP.

The objective of this phase of works is to implement the 2022 dry season sampling event scope of works in accordance with the SAQP (AECOM, 2022).

2.0 Scope of Work

The sampling event at the Base was completed in general accordance with the SAQP (AECOM, 2022). In summary, the scope of works for this sampling event included:

- Review of the SAQP prior to the monitoring event to ensure compliance with relevant Australia guidance and suitable for the proposed sampling.
- *August 2022* – Collection of 31 sediment and 21 co-located surface water samples (where water was present) including 18 on-Base and 13 off-Base locations (refer to **Figure 2** and **3**, **Appendix A**). Collection of groundwater samples at 38 locations including 29 on-Base and 9 off-Base locations.
- *September 2022* – Collection of one sediment sample on-Base which was unable to be accessed during the August sampling event.
- *October 2022* – Collection of one groundwater sample and one surface water sample. Due to anomalous PFAS detections in groundwater from MW131 and surface water from SW110, during the August sampling round, replicate samples were collected, refer to **Section 3.7** for further information.
- Collection of groundwater gauging data and water quality parameter data for surface water and groundwater sample locations (where water was present).
- Analysis of all samples for the PFAS suite (28 analytes) at the standard limit of reporting (LOR).
- Collection of field duplicate and triplicate samples at a rate of 1 in 10 primary samples, one rinsate sample per fieldwork day, and one trip blank per batch analysed for PFAS suite (28 analytes).
- Data management of all OMP field and laboratory data in the Defence ESdat database.
- Preparation of this Sampling Event Factual Report.

Refer tables below for nominated sampling locations as outlined in the SAQP (AECOM, 2022). Deviations from the SAQP are identified in **Section 3.7**.

Table 1 Planned Groundwater Sampling Locations

Source Area	Monitoring Well ID	Total wells
Eastern PFAS Contamination Area	MW018, MW114, MW115, MW116, MW139	5
Former B Squadron	MW135	1
Former Fire Station	MW105, MW128	2
Former Fire Training Area	MW131 ¹	1
Former Helicopter Squadron	MW102	1
Lavarack Golf Course and Sporting Fields	MW065, MW120, MW121, MW122, MW123I, MW123S	6
Monocell	MW072, MW074, MW106	3
Stockpile Designated Area 2	MW141	1
Suspected Aqueous Film Forming Foam (AFFF) Disposal Area	MW101	1
Top, Middle and Lower Dams	MW138	1
Base Boundary – On-Base	MW002, MW003, MW118, MW119, MW124, MW125I, MW125S	7
Off-Base	MW205S, MW212, MW217, MW220S, MW226, MW232, MW233, MW235S, MW236S	9

¹Supplementary sample collected in October 2022 to verify results.

Table 2 Planned Surface Water Sampling Locations

Source Area	Surface Water Location ID
Eastern PFAS Contamination Area	SW119 [#] , SW121
Former Fire Station	SW109, SW110 ¹
Lavarack Golf Course & Sporting Field	SW129 [#] , SW130 [#]
Top Middle and Lower Dams ¹	SW139, SW140, SW144
Remaining on-Base	SW113, SW120 [#]
Base Boundary	SW126 [#] , SW128 [#] , SW132 [#] , SW133 [#] , SW134 [#] , SW135, SW136 [#]
Off-Base	SW203, SW205, SW211, SW212, SW217, SW220, SW227, SW232, SW233, SW242, SW243, SW244, SW245

¹Supplementary sample collected in October 2022 to verify results.

[#] Location was dry during dry season 2022 sampling event and therefore no sample collected at this location.

Table 3 Planned Sediment Sampling Locations

Source Area	Sediment Location ID
Eastern PFAS Contamination Area	SD119, SD121
Former Fire Station	SD109, SD110
Lavarack Golf Course and Sporting Fields	SD129, SD130
Top Middle and Lower Dams ¹	SD139, SD140, SD144
Remaining on-Base	SD113, SD120
Base Boundary	SD126, SD128, SD132, SD133, SD134, SD135, SD136
Off-Base	SD203, SD205, SD211, SD212, SD217, SD220, SD227, SD232, SD233, SD242, SD243, SD244, SD245

3.0 Methodology

The methodology used for 2022 dry season sampling event was in general accordance with the SAQP (AECOM, 2022) and is summarised in **Sections 3.1-3.3**.

3.1 Groundwater Sampling Methodology

The groundwater sampling methodology is outlined in **Table 4** below.

Table 4 Groundwater Sampling Methodology

Item	Details
Groundwater Gauging	<p>Depth to groundwater was measured at the beginning of the sampling round at all wells. Only wells which are not tidally influenced and screened within the shallow aquifer were used for inferring groundwater flow direction and contours as presented on Figure 4, Appendix A.</p> <p>The depth to groundwater was also measured in each monitoring well immediately prior to the collection of groundwater samples.</p>
Water Quality Parameters	<p>Temperature, electrical conductivity (EC), dissolved oxygen (DO), oxidation reduction potential (ORP), pH and observations of water quality were recorded using a calibrated water quality meter (results detailed in Table T1). Equipment calibration certificates for the water quality meter are provided in Appendix F.</p>
Sampling Methodology	<p>Groundwater samples were collected from all monitoring wells using no-purge methodology HydraSleeves™, which were installed within the screened interval of each well (based on a review of the well construction log) for a minimum of 24 hours prior to the sampling round (as detailed in Table T1, Appendix B).</p> <p>For wells without available construction details, HydraSleeves™ were installed at the bottom of the well, consistent with the screened interval for wells installed in the same aquifer.</p> <p>A decontaminated steel bailer may be used to collect samples where there is insufficient volume available in the HydraSleeve™ for sampling.</p>

3.2 Surface Water Sampling Methodology

The surface water sampling methodology is outlined in **Table 5** below.

Table 5 Surface Water Sampling Methodology

Item	Details
Water Quality Parameters	Temperature, electrical conductivity (EC), dissolved oxygen (DO), oxidation reduction potential (ORP), pH and observations of water quality were recorded using a calibrated water quality meter. Equipment calibration certificates for the water quality meter are provided in Appendix F .
Sampling Methodology	Samples were collected from immediately below the water surface, with either a sampling pole or directly into laboratory supplied sample containers, to minimise collection of sediment or floating materials in the samples. At each location, a new, laboratory-supplied container was lowered into the water with the cap immediately applied once the container was full. Where the waterway could not be accessed from the bank a telescopic sampler with a decontaminated stainless-steel scoop was used to collect the sample. The sample was immediately transferred into the new laboratory supplied container.

3.3 Sediment Sampling Methodology

The sediment sampling methodology is outlined in **Table 6** below.

Table 6 Sediment Sampling Methodology

Item	Details
Sampling Methodology	Samples representative of potentially deposited sediments were collected from within the water body (if possible) using a piston sediment sampler or with a trowel from the base of drains (where possible). Samples were collected from the surface of the sediment up to a depth of 0.1 m, where this depth was achievable. At each location, a new laboratory supplied container was used for each sample.
Logging	Sediment characteristics were recorded for each sample and are summarised in Table T5, Appendix B .

3.4 Quality Assurance/Quality Control and Analysis

The Quality Assurance/Quality Control (QA/QC) requirements and analysis completed for the OMP sampling event are summarised in **Table 7**, below.

Table 7 QA/QC and Analysis for OMP

Item	Details
QA/QC Samples	Field QA/QC samples collected included intra-laboratory duplicate and inter-laboratory duplicate samples (i.e. splits), trip blank samples and rinsate samples. Intra- and inter-laboratory samples were collected at a rate of one per ten primary samples. Trip blanks were prepared in the laboratory by filling sampling containers with laboratory supplied PFAS-free deionised water and were included at a rate of one per batch of samples (excluding private property sampling). Rinsate samples were collected at a rate of one per day of sampling when non-dedicated equipment was used by pouring laboratory supplied PFAS-free deionised water over the decontaminated sampling equipment. Refer to Appendix C for assessment of QA/QC sample data.

Item	Details
Sample Analysis	<p>All primary samples were submitted for PFAS suite analysis using the standard levels of detection.</p> <p>Australian Laboratory Services (ALS) Environmental Pty Ltd Brisbane, Queensland was used as the primary laboratory. The National Measurement Institute (NMI) of Sydney, New South Wales was used as the secondary laboratory. ALS and NMI methods for analyses of PFAS in are certified by the National Association of Testing Authorities (NATA).</p> <p>Chain of Custody Forms are presented in Appendix D. Laboratory certificates are presented in Appendix E.</p>

3.5 Adopted Screening Criteria

Adopted screening criteria references national guidance in the form of the PFAS National Environmental Management Plan (NEMP), Defence estate and environmental strategies, and Defence PFAS-specific strategies and guidance. Guidance documents used to assess the dataset include the following:

- PFAS NEMP, (HEPA 2020).
- Department of Health, 2019. *Health Based Guidance Values for PFAS for use in site investigations in Australia*. April 2017 [updated September 2019].
- National Health and Medical Research Council (NHMRC), 2019. *Guidance on PFAS in Recreational Water*. August 2019 (NHMRC 2019).
- *National Environment Protection (Assessment of Site Contamination) Measure 1999, Schedule B1, as amended in 2013* (ASC NEPM, 2013).

In accordance with the OMP (Defence, 2020) and SAQP (AECOM, 2022), the adopted PFAS screening criteria to assess the data generated as part of the OMP are presented in **Table 8** below.

Table 8 Summary of Adopted Screening Criteria

Pathway	Compound	Criteria	Comment / Reference
Human Health Receptors			
Drinking Water	PFOS + PFHxS	0.07 µg/L	The values are from the PFAS NEMP (HEPA, 2020). Where the guideline value refers to the sum of PFOS + PFHxS, this includes PFOS only, PFHxS only and the sum of the two (HEPA, 2020). <i>All off base groundwater results will be compared to these criteria, as well as one surface water location (SW245) which is within Townsville's emergency drinking water supply.</i>
	PFOA	0.56 µg/L	
Recreational use – surface water	PFOS + PFHxS	2 µg/L	The values are from the PFAS NEMP (HEPA, 2020). <i>All surface water results will be compared to these criteria.</i>
	PFOA	10 µg/L	
Ecological Receptors			
Freshwater and marine water (95% species protection values)	PFOS	0.13 µg/L	The values are from the PFAS NEMP (HEPA, 2020). <i>All surface water and groundwater results will be compared to these criteria.</i>
	PFOA	220 µg/L	

3.6 Data Quality Objectives and Data Validation

The data quality objectives (DQO) and data quality indicators (DQI) adopted for these works are presented in the SAQP (AECOM, 2022).

Data validation assessment is provided in **Appendix C**. Based on anomalous results identified in the August 2022 data set, resampling at two locations (SW110 and MW131) was undertaken, in October 2022, to validate the results. These results are discussed in **Section 4.1.2** (MW131) and **Section 4.2.2** (SW110) and confirmed new maximum concentrations for PFAS at both locations.

Data validation procedures employed in the assessment of the field and laboratory QA/QC data indicated that the reported analytical results are representative of the sample locations and that the overall quality of the analytical data produced is acceptably reliable for the purpose of this report.

All data collected during August, September and October 2022 have been reviewed and uploaded to the Defence ESdat database in accordance with Defence Contamination Management Manual (DCMM) (Defence, 2018 as amended 2021) Annex L requirements.

3.7 Deviations from the SAQP

Table 9 lists the deviations from the SAQP (AECOM, 2022) during this sampling round.

Table 9 Deviations from the SAQP during 2022 Dry Season Sampling Event

SAQP Deviation	Comment/Justification	Impact on Dataset
Collection of surface water at SW119, SW120, SW126, SW128, SW129, SW130, SW132, SW133, SW134 and SW136	No surface water was present during the dry season sampling event at SW119, SW120, SW126, SW128, SW129, SW130, SW132, SW133, SW134 and SW136.	Minor – No data available at these locations for dry season 2022. The data set is considered representative of the conditions within the Management Area being monitored.
Gauging and sampling at MW235S.	Depth to groundwater could not be measured at MW235S during the gauging round.	Following clearing of the roots in the well, samples were able to be collected using a decontaminated steel bailer from MW235S and sufficient gauging data was collected across the Base to determine groundwater flow direction. No impact on the data set.
Collection of sediment sample from SD120.	Sediment was collected at SD120 in September 2022 after the main sampling event due to access issues during the August sampling round.	The location was able to be accessed and a sample obtained with no impact on the data set.
Collection of additional groundwater sample at MW131. Trip blank and rinsate samples not collected for verification sampling.	Laboratory analytical results for the sample collected at MW131 on 26 August 2022 indicated anomalous PFAS detections (sum of PFAS 656 µg/L). Due to the anomaly, the well was resampled on 7 October 2022 to verify the detections.	Resampling of the well indicated PFAS concentrations were closer to the previous historical maximum (pre-August 2022) therefore more representative of groundwater PFAS concentrations and accepted as the dry season result for 2022. No impact to data set from absence of trip blank and rinsate for verification sampling.

SAQP Deviation	Comment/Justification	Impact on Dataset
<p>Collection of additional surface water sample at SW110. Trip blank and rinsate samples not collected for verification sampling.</p>	<p>Laboratory analytical results for the sample collected at SW110 on 22 August 2022 indicated anomalous PFAS detections (sum of PFAS 95.6 µg/L). Due to the anomaly, the location was resampled on 7 October 2022 to verify the detections.</p>	<p>Resampling of the location indicated PFAS concentrations were closer to the August 2022 sampling result and therefore representative of groundwater PFAS concentrations at this location in the dry season for 2022.</p> <p>No impact to data set from absence of trip blank and rinsate for verification sampling.</p>

4.0 Field Observations and Results

The 2022 dry season sampling event was completed between 22 and 26 August, with one sample (SD120) collected on 3 September 2022 and additional sampling completed at two locations on 7 October 2022. Groundwater gauging and deployment of HydraSleeves™ in wells which conflict with other sampling programs, was conducted at the beginning of the sampling round.

The results are summarised in the following sections.

Details on weather conditions and estate management works or training activities during the sampling event are recorded in **Table 10**.

Table 10 Weather Conditions and Estate Activities at Time of Sampling

Item	Observations
Weather Conditions	<p>The Bureau of Meteorology (BOM) (BOM, 2022) reported the following monthly rainfall data leading up to and during the 2022 dry season sampling event:</p> <ul style="list-style-type: none"> • May 2022: 153.0 mm • June 2022: 24.0 mm • July 2022: 50.0 mm • August 2022: 1.0 mm • September 2022: 21.2 mm • October 2022: 41.6 mm <p>Weather was warm and sunny during the sampling program between August and October 2022. The conditions monitored were representative of dry season conditions within the Management Area.</p>
Estate Management Works or Training Activities	<p>Construction associated with the Land 400 project was underway during the sampling event, on the corner of Lachlan Wilson Drive and Gallipoli Drive. This did not impact access to sample locations, however, earthworks in this area have the potential to impact PFAS concentrations in surface water and sediment samples down gradient of the project, near the Base boundary.</p> <p>Soil disturbance activities were identified on the corner of Andrew Ball Drive and Gallipoli Drive comprising the stockpiling of soils at the southern end of the Middle Dam.</p> <p>No other estate management works, or training exercises impacted access to sample groundwater, surface water and sediment locations.</p>

The results of the sampling event are summarised in **Sections 4.1-4.3**.

4.1 Groundwater

4.1.1 Observations and Field Measurements

Table 11 Groundwater Observations and Field Measurements

Item	Observations
Access	All monitoring wells were accessible.
Monitoring Well Network	All monitoring wells were observed to be in serviceable condition with the exception of MW115 which has a bend in the casing approximately 0.75 metres below top of casing (mBTOC).
Field Observations	Groundwater from four monitoring well locations (MW115, MW205S, MW212 and MW217) had a sulphurous odour. A slight organic odour was recorded during the sampling of monitoring well MW101.

Item	Observations
	<p>Groundwater colour was typically recorded as clear. Yellow coloured groundwater was observed at MW212 and MW232. Grey/brown coloured groundwater was observed at MW217 and light brown coloured groundwater was observed at MW236S.</p> <p>Turbidity was typically recorded as low, with medium level turbidity observed at six well locations (MW018, MW123S, MW212, MW217, MW235S and MW236S).</p> <p>No visible or olfactory indications of contamination were observed during the sampling round.</p> <p>Field observations are presented Table T1 in Appendix B.</p>
Depth to Groundwater	<p>Depth to groundwater ranged between 0.465 (MW232) and 5.824 (MW205S) mBTOC. It is noted that multiple groundwater systems are present across the Management Area. Groundwater elevations within the shallow (alluvial) aquifer were between 1.845 (MW232) and 25.507 (MW141) metres Australian Height Datum (mAHD). Groundwater elevations within the deeper (rock) aquifer were between 8.74 (MW115) and 19.175 (MW106) mAHD.</p> <p>Groundwater gauging data are presented in Table T1 in Appendix B.</p>
Groundwater Flow Direction	<p>Groundwater contours and inferred groundwater flow directions in August 2022 are shown on Figure 4 in Appendix A. The inferred local groundwater flow direction for the shallow aquifer is to the north across the western portion of the Site and north east in the eastern portion of the Site, consistent with previous monitoring rounds. Monitoring wells which are tidally influenced have been removed from the contours as have wells MW074, MW226, MW105 and MW128 which were identified to have incorrect survey data.</p>
Water Quality Parameters	<p>Groundwater quality parameters were measured at the time of sampling. The readings are presented in Table T1 in Appendix B and are summarised below, covering all sampling completed:</p> <ul style="list-style-type: none"> • DO results ranged between 0.30 mg/L (MW220S) to 8.3 mg/L (MW235S) indicating poorly to well oxygenated conditions across the Management Area. Anomalous results were reported for samples from MW018, MW002 and MW125I. • EC ranged from 719 $\mu\text{S}/\text{cm}$ (MW115) to 42,048 $\mu\text{S}/\text{cm}$ (MW232) indicating fresh to saline conditions across the Management Area. • pH ranged from 5.68 (MW217) to 7.91 (MW115). pH results generally indicated slightly acidic to slightly alkaline conditions across the Management Area. • ORP ranged from -153.4 mV (MW115) to 180.0 mV (MW131) indicating moderately to strongly reducing conditions. • Temperature ranged from 21.5 °C (MW226) to 28.2 °C (MW074). <p>These results are generally consistent with the groundwater quality parameters from the previous four monitoring rounds since dry season 2020.</p>

4.1.2 Groundwater Analytical Results

Of the 38 groundwater wells sampled during this event, 35 samples reported concentrations of PFAS at or above the laboratory LOR. The PFAS groundwater analytical results from this sampling event are presented in **Table T2** in **Appendix B**.

There were no first-time detections or new exceedances of the human health or ecological guidelines during the sampling. Four of the nine samples collected off-Base, exceeded the adopted drinking water guideline for PFOS+PFHxS. One exceedance of the ecological guideline for PFOS was reported in off-Base well (MW236S). A total of 18 on-Base and boundary samples exceeded the ecological guideline (for PFOS). No on or off Base samples exceeded the PFOA ecological guideline.

Historical groundwater results are presented in **Table T7, Appendix B**.

Groundwater sampling results were generally within the same order of magnitude as historically reported concentrations.

It is noted that concentrations of PFOS and PFHxS at MW131 were higher than historically reported. This location was resampled on 7 October and confirmed new historical maximum concentrations for PFOS (45.3 µg/L), PFOA (3.6 µg/L) and PFHxS (36.8 µg/L). MW131 is located at the Former Fire Training Area as shown in **Figure 1 (Appendix A)**.

4.2 Surface Water

4.2.1 Observations and Field Measurements

Table 12 Surface Water Observations and Field Measurements

Item	Observations
Access	All surface water locations were accessible during the sampling event. SW119, SW120, SW126, SW128, SW129, SW130, SW132, SW133, SW134 and SW136 were dry during the August sampling event and could not be sampled.
Field Observations	Surface water at SW121 exhibited a slight biological sheen on the surface and was noted to have sediment and algae. Surface water on-Base was observed to be clear. Yellow coloured surface water was observed at six locations (SW203, SW205, SW217, SW220, SW232 and SW242), and a yellowish-brown colour observed at SW243. No other visible or olfactory indications of contamination were observed during the sampling of the surface water locations. Field observations are presented Table T3 in Appendix B .
Water Quality Parameters	Surface water quality parameters were measured at the time of sampling. Readings are presented in Table T3 in Appendix B and are summarised below: <ul style="list-style-type: none"> DO results ranged between 1.87 mg/L (SW144) and 12.66 mg/L (SW220) indicating moderately to well oxygenated conditions. EC ranged from 190.5 µS/cm (SW245) 43,042 µS/cm (SW243) indicating relatively fresh conditions in urban runoff areas and saline conditions in areas with tidal connectivity. pH ranged from 6.90 (SW203) to 8.58 (SW220). pH results generally indicated near neutral to alkaline conditions. ORP ranged from -48.5 mV (SW121) to 128.4 mV (SW217) indicating moderately to strongly reducing conditions. Temperature ranged from 15.1°C (SW212) to 26.9°C (SW244).

4.2.2 PFAS Surface Water Analytical Results

Samples collected from 18 locations reported concentrations of PFAS above the laboratory LOR. The PFAS surface water analytical results from this sampling event are presented in **Table T4 in Appendix B**. There were no first-time detections of PFOS, PFOA or sum of PFOS+PFHxS

One new exceedance of recreational guidelines for PFOS+PFHxS was reported at SW220, located off-Base, as shown on **Figure 5, in Appendix A**. PFOS concentrations in nine samples exceeded the adopted ecological guidelines for PFOS. Two samples exceeded the ecological guideline for PFOA. Sum of PFOS+PFHxS concentrations in two on-Base samples (SW109 and SW110) and one off-Base sample (SW220) exceeded the adopted recreational use guidelines (**Table T4, Appendix B**).

The following historical maximum concentrations were recorded during the August 2022 sampling round:

- PFOS at SW109.
- PFOS, PFOA, sum of PFOS + PFHxS, at SW110 located at the Former Fire Station source area. This location was resampled on 7 October and confirmed new historical maximum concentrations for the PFAS listed.
- Sum of PFOS + PFHxS at SW220.
- Sum of PFOS + PFHxS at SW233.

Historical surface water results are presented in **Table T8, Appendix B**.

4.3 Sediment

4.3.1 Observations and Field Measurements

Table 13 Sediment Observations

Item	Observations
Access	All sediment sampling locations were accessible. During the August 2022 sampling event sediment was collected at all 31 sampling locations.
Field Observations	A sulphurous odour was detected at sampling location SD245. Organic odours were detected at sample locations SD121, SD139 and SD220. Sediment logging and observation data are presented in Table T5, Appendix B .

4.3.2 PFAS Sediment Analytical Results

Of the 31 sediment samples collected, 25 samples reported concentrations of PFAS above the laboratory LOR. The PFAS sediment analytical results from this sampling event are presented in **Table T6 in Appendix B**.

Historical sediment results are presented in **Table T9, Appendix B**. There were no first-time detections of PFOA or PFOS+PFHxS in sediment. The following locations recorded historical maximum concentrations during the August 2022 sampling round:

- PFOS, sum of PFOS + PFHxS at SD109
- PFOA and PFOS at SD121
- PFOS and sum of PFOS + PFHxS at SD126
- PFOS and sum of PFOS + PFHxS at SD129
- PFOS and sum of PFOS + PFHxS at SD133
- PFOS and sum of PFOS + PFHxS at SD242.

There are no endorsed human health or ecological guideline values available for sediment.

5.0 Summary and Next Sampling Event

5.1 Summary of Sampling Event

The routine OMP Dry Season Sampling Event was undertaken at the Base between 22 and 26 August 2022. One sediment sample was collected on 3 September 2022 at SD120 as access was not available during the main sampling event. Due to the anomalous PFAS detections present in sample MW131 and SW110 from the main sampling event, these locations were resampled on 7 October 2022. This dry season sampling event included sampling from 38 groundwater monitoring locations, 21 surface water monitoring locations and 31 sediment monitoring locations.

Table 14 summarises the findings of the August to October 2022 sampling events and the recommended actions.

Table 14 Summary of Sampling Event

Item	Comment	Recommended Actions
<u>Access to sampling locations</u>	All groundwater monitoring wells, surface water and sediment locations were accessible during the dry season monitoring event.	Ongoing monitoring in accordance with the OMP.
<u>Surface Water:</u> Insufficient water to sample	During the August 2022 sampling event, surface water was not present at 10 monitoring locations, SW119, SW120, SW126, SW128, SW129, SW130, SW132, SW133, SW134 and SW136, at the time of sample collection.	Ongoing monitoring in accordance with the OMP. Review locations in light of sample suitability if long term matrix availability becomes a constraint.
<u>Analytical Results</u>	PFAS were detected at or above the laboratory LOR in 35 of the 38 groundwater samples, 18 of the 21 surface water samples and 25 of the 31 sediment samples analysed.	Ongoing monitoring in accordance with the OMP.
<u>First-time detections and new exceedances.</u>	There were no first-time detections of Sum of PFOS+PFHxS or PFOA. There were no new exceedances of drinking water guidelines (off-site samples only) or the 95% species protection ecological guidelines (HEPA, 2020). There was one first-time exceedance of the NHMRC (2019) recreational use guidelines for PFOS+PFHxS at SW220.	Ongoing monitoring in accordance with the OMP.

5.2 Upcoming Sampling Events

The next biannual sampling event is scheduled for March 2023.

5.3 Upcoming Annual Interpretive Report

The next annual interpretive report is scheduled for March 2023.

6.0 References

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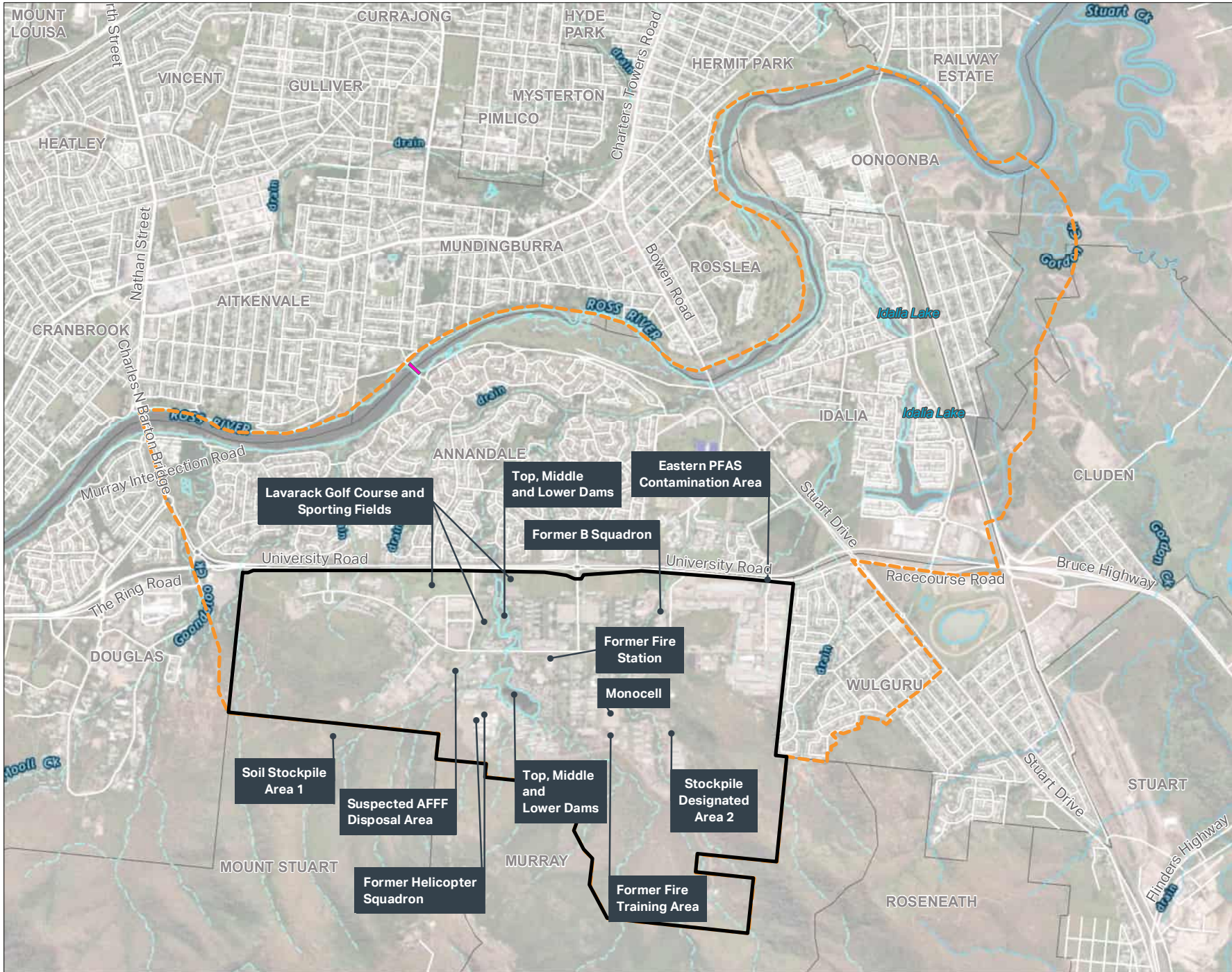
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Appendix A

Figures



Legend

- Base Boundary
- Management Area
- Aplin's Weir
- Source Areas
- Watercourses

FIGURE 1: LAVARACK BARRACKS LOCATION AND SOURCE AREAS

PROJECT NAME:
PFAS OMP
REPORT NAME:
PFAS OMP – Lavarack Barracks (0229) Townsville, Sample Event Factual Report August 2022
CLIENT NAME:
Department of Defence
PROJECT NUMBER:
60612487

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Legend

- Base Boundary
- Sub-Management Area Boundary
- Aplin's Weir
- Source Areas
- On-base Monitoring Well
- Off-base Monitoring Well
- Major - perennial
- Major - non perennial
- Minor - perennial
- Minor - non perennial

**FIGURE 2:
GROUNDWATER
SAMPLING LOCATIONS**

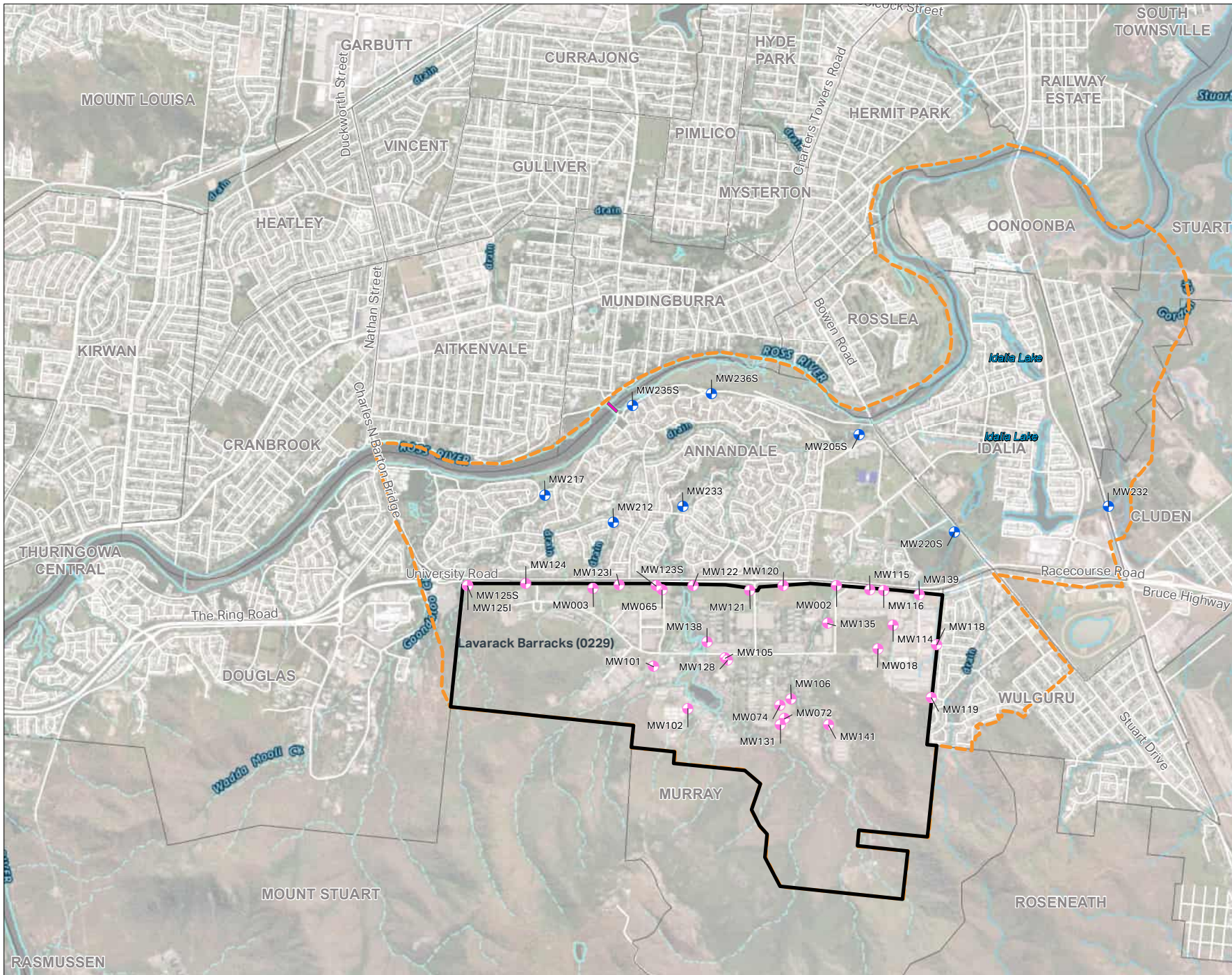
PROJECT NAME:
PFAS OMP
REPORT NAME:
PFAS OMP – Lavarack Barracks
(0229) Townsville,
Sample Event Factual Report
August 2022
CLIENT NAME:
Department of Defence
PROJECT NUMBER:
60612487

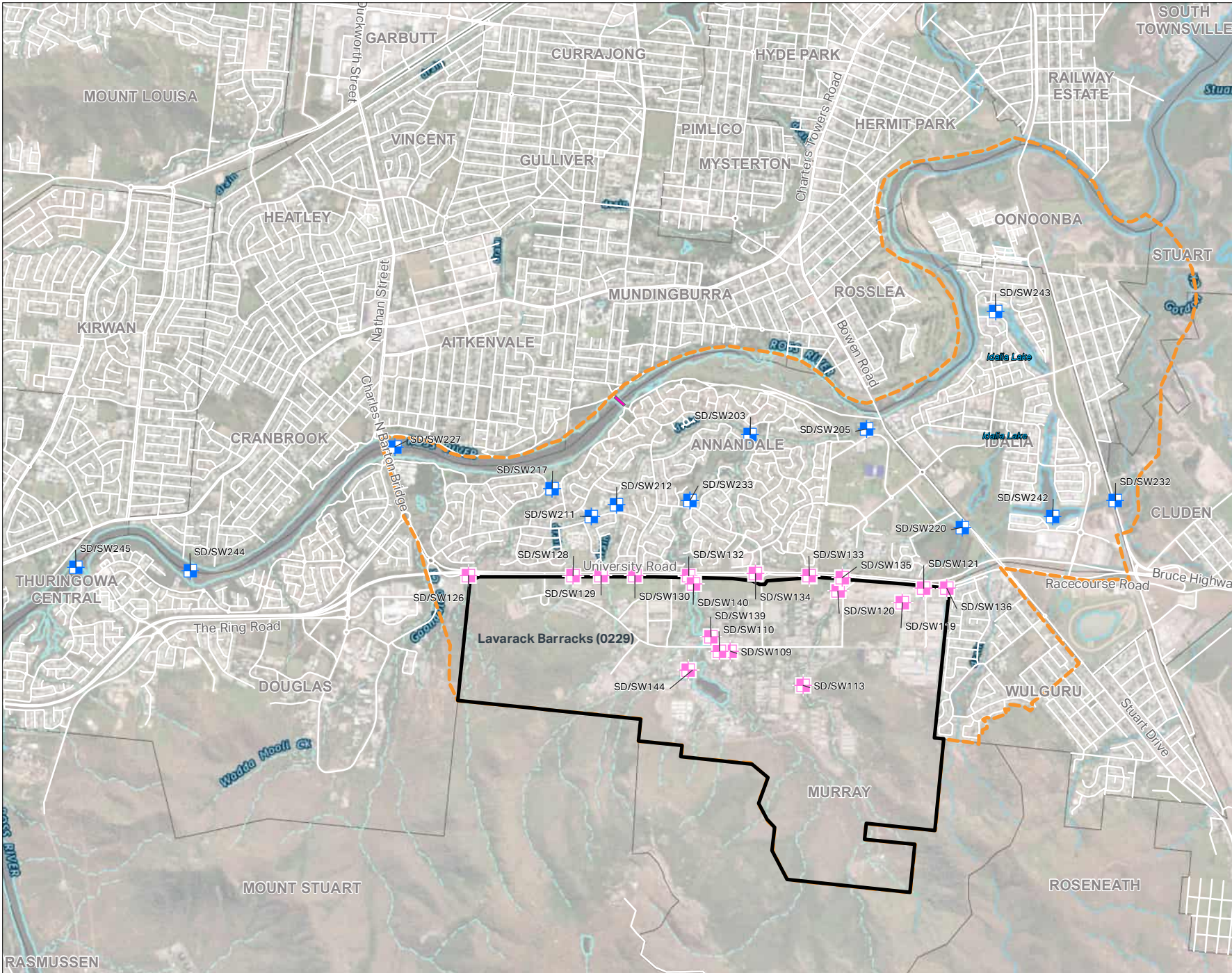
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- Legend**
- Base Boundary
 - Sub-Management Area Boundary
 - Aplin's Weir
 - Source Areas
 - On-base Surface Water/Sediment Sample
 - Off-base Surface Water/Sediment Sample
 - Major - perennial
 - Major - non perennial
 - Minor - perennial
 - Minor - non perennial

**FIGURE 3:
CO-LOCATED SURFACE
WATER AND SEDIMENT
SAMPLING LOCATIONS**

PROJECT NAME:
PFAS OMP
REPORT NAME:
PFAS OMP – Lavarack Barracks
(0229) Townsville,
Sample Event Factual Report
August 2022
CLIENT NAME:
Department of Defence
PROJECT NUMBER:
60612487

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Legend

- Base Boundary
- Management Area
- Aplin's Weir
- Off-Base Monitoring Well
- On-Base Monitoring Well
- Source Areas
- Inferred Groundwater Contour
- Groundwater Flow Direction
- Watercourses

**FIGURE 4:
INFERRED
GROUNDWATER
CONTOURS- SHALLOW
AQUIFER (ALLUVIUM)
DRY SEASON**

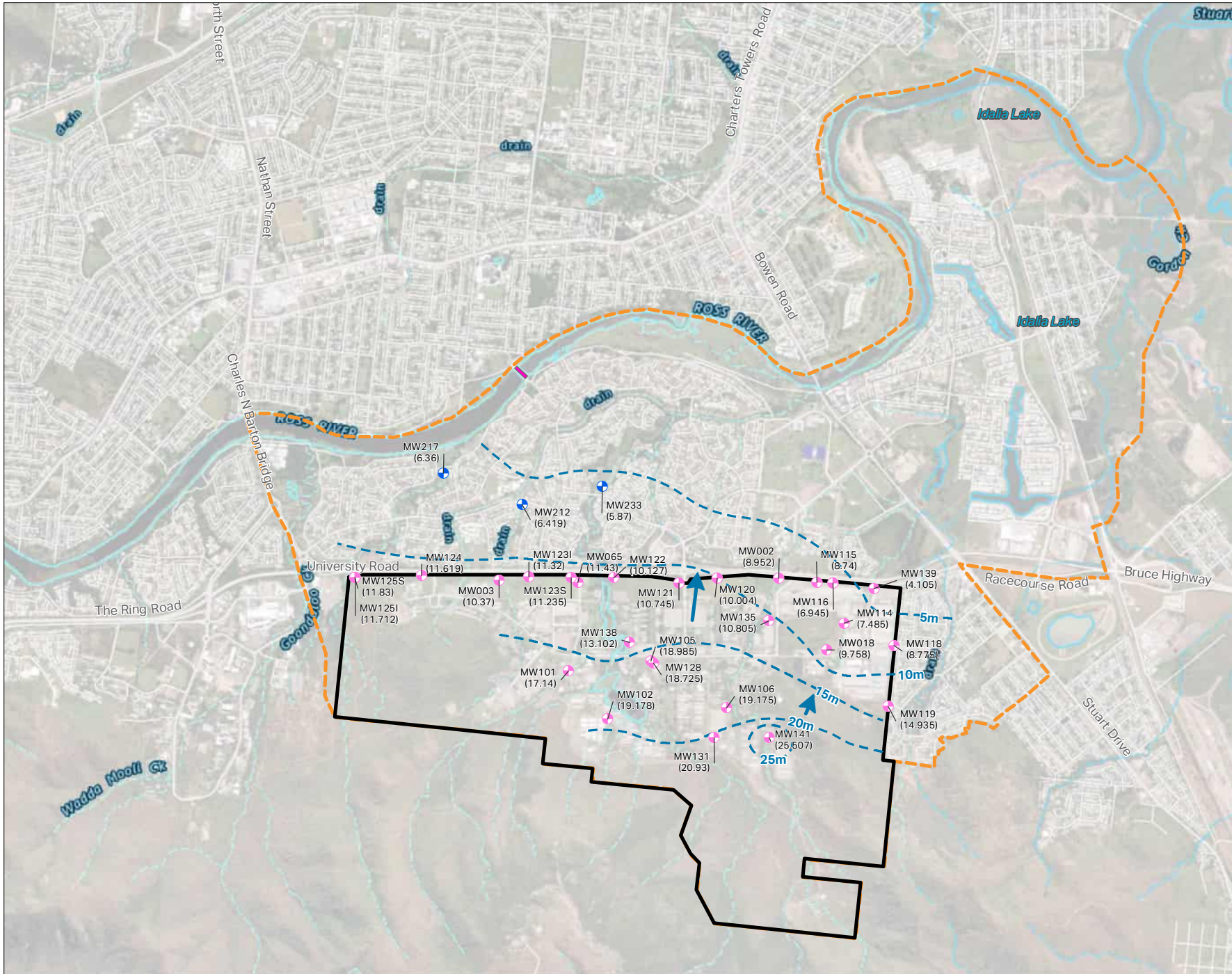
PROJECT NAME:
PFAS OMP
REPORT NAME:
PFAS OMP – Lavarack Barracks
(0229) Townsville,
Sample Event Factural Report
August-September 2022
CLIENT NAME:
Department of Defence
PROJECT NUMBER:

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Legend

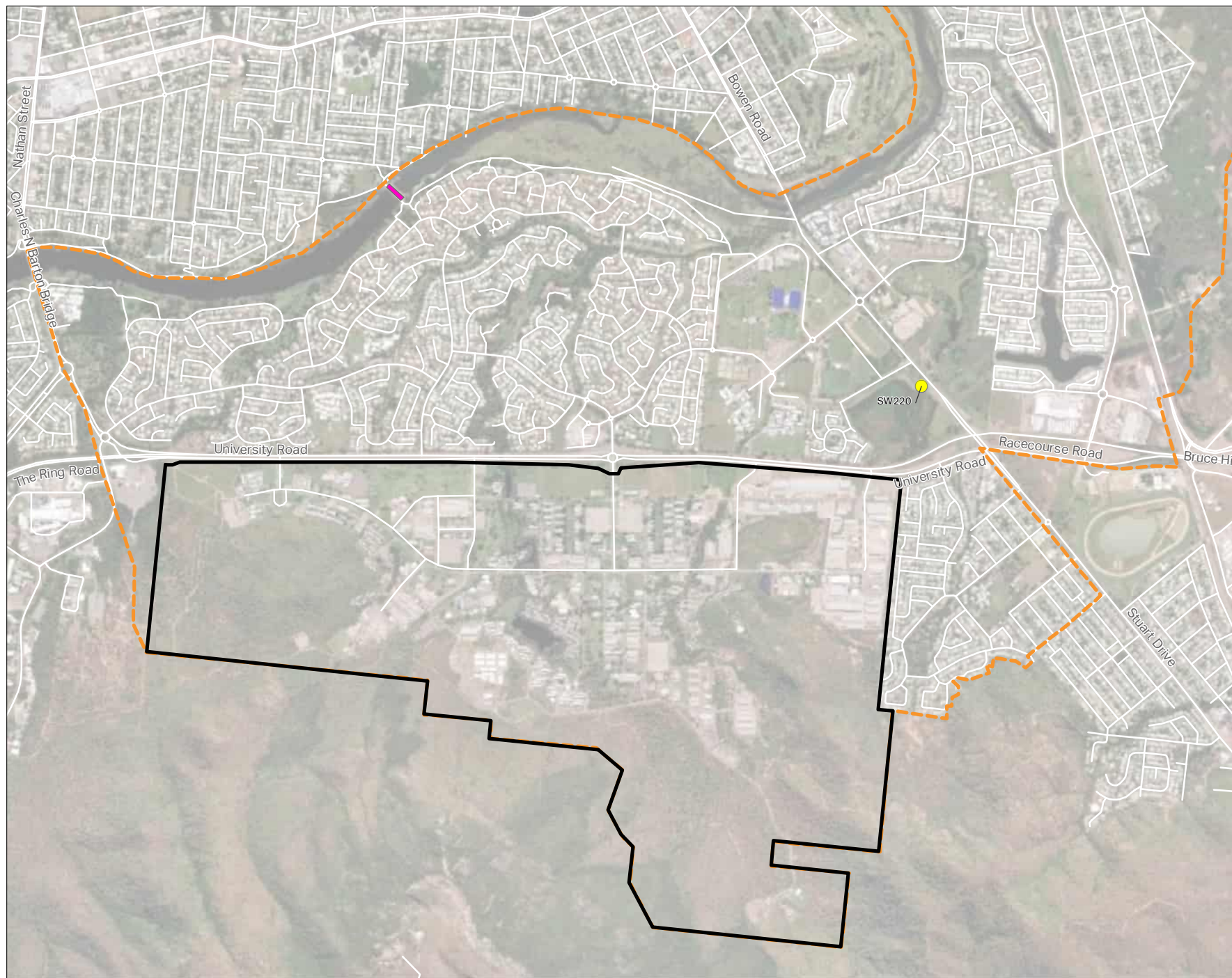
Management Area

Sub-Management Area Boundary

Aplin's Weir

New exceedance of human health

recreational guideline for PFOS+PFHxS



**FIGURE 5:
NEW EXCEEDANCE
OF HUMAN HEALTH
RECREATIONAL GUIDELINE
IN SURFACE WATER**

PROJECT NAME:
PFAS OMP
REPORT NAME:
PFAS OMP – Lavarack Barracks
(0229) Townsville,
Sample Event Factural Report
August to October 2022
CLIENT NAME:
Department of Defence
PROJECT NUMBER:
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Appendix B

Analytical Tables

Table T3: Surface Water Quality Parameter Results

Location Code	Sample Date	DO mg/L	EC µS/cm	pH	Redox (mV)	Temp (°C)	Turbidity	Water Colour	Odour	Sheen	Comments
Eastern PFAS Contamination Area											
SW121	22/08/2022	4.17	4076	7.05	-48.5	23.8	Low	Clear	No odour	Slight sheen	Pale orange algae present. Water slightly flowing.
Former Fire Station											
SW109	22/08/2022	5.02	1139	7.82	86.5	21.6	Low	Clear	No odour	No sheen	Limited water within drainage channel (no flow), highly vegetated, some sediment in water sample
SW110	22/08/2022	2.99	2849	7.74	61.64	23.4	Low	Clear	No odour	No sheen	Limited amount of water to sample from (no flow), some sediment in water sample
Top, Middle and Lower Dams											
SW139	22/08/2022	2.8	520	8.2	100.8	22.5	Low	Clear	No odour	No sheen	High plant content, difficult to obtain sample. No flow
SW140	22/08/2022	5.55	440.5	7.85	109.9	23.2	Low	Clear	No odour	No sheen	Thick grass at bank. No flow
SW144	22/08/2022	1.87	218.9	8.04	100	21.7	Low	Clear	No odour	No Sheen	Shady area, shallow and silty bank some sediment in sample due to low water level. No flow.
Remaining On-Base											
SW113	22/08/2022	11.97	405.3	8.24	97.5	23.3	Low	Clear	No odour	No sheen	Some surface algae present. No flow.
Base Boundary											
SW135	22/08/2022	7.7	634	7.83	77.6	23.2	Low	Clear	No odour	No Sheen	Sample from drainage culvert, refuse comprising empty bottles was present at this location. Low flow.
Off-Base											
SW203	22/08/2022	3.72	3217	6.9	94.6	22.4	Low	Pale yellow 5Y 8/3	No odour	No sheen	Sandy creek, slow flowing, approximately 50 cm deep, 10 m wide
SW205	22/08/2022	5.55	30109	7.4	110.4	26.7	Clear	Pale yellow 5Y 8/3	No odour	No sheen	Collected on outgoing tide. Slow flowing water.
SW211	22/08/2022	2.24	8717	7.18	70.1	16.2	Low	Clear	No odour	No sheen	Drainage gully, some freshly cut grass in water. No flow.
SW212	22/08/2022	8.29	14992	8.1	71.9	15.1	Clear	Clear	No odour	No sheen	Large culvert, minimal water, slightly flowing
SW217	22/08/2022	2.83	1282	7.2	128.4	21.1	Low	Pale yellow 5Y 8/3	No odour	No sheen	Earthen creek, approximately 5 m across, 10 cm deep. No flow.
SW220	22/08/2022	12.66	3665	8.58	75.4	26	Clear	Pale yellow 5Y 8/3	No odour	No sheen	Adjacent to culvert.
SW227	22/08/2022	5.63	257.1	7.22	60.1	20.5	Low	Clear	No odour	No sheen	Middle of river sample. No flow
SW232	22/08/2022	4.38	33869	7.76	87.7	26.1	Low	Pale yellow 5Y 8/3	No odour	No sheen	Earthen drain adjacent road culvert. Slow flowing
SW233	22/08/2022	6.01	218.1	7.5	82.12	22.5	Low	Clear	No odour	No sheen	Shallow creek. Some reeds in sample location. No flow.
SW242	22/08/2022	5.62	35095	8.12	89.9	25.3	Clear	Pale yellow 5Y 8/3	No odour	No sheen	Man made lake, sample collected 30 cm out from bank. No flow
SW243	22/08/2022	6.22	43042	8.03	110.4	26.8	Medium	Yellowish Brown 10YR 5/6	No odour	No sheen	Idalia Lake, approximately 20 cm deep at sample point. No flow
SW244	22/08/2022	4.99	209.5	7.55	41.7	26.9	Low	Clear	No odour	No sheen	Middle of river, above weir. No flow
SW245	22/08/2022	5	190.5	7.3	66	23.9	Low	Clear	No odour	No sheen	Middle of river, above weir. No flow

DO - Dissolved Oxygen
 EC - Electrical Conductivity
 Eh - Redox Oxidation Potential
 Temp - Temperature
 mg/L - milligrams per litre

µS/cm - microsiemens per centimetre
 °C - degrees Celsius
 "-" denotes no analysis recorded
 mV - millivolt

Location ID	Date	Sample Description	Odour	Comment
Eastern PFAS Contamination Area				
SD119	22/08/2022	gravelly SAND coarse, well graded, sub angular gravel, brown to yellow, moist	N	Some surface algae
SD121	22/08/2022	clayey SAND, medium density, dark grey, low plasticity, wet, trace silt	Y	Plant roots and surface algae
Former Fire Station				
SD109	22/08/2022	gravelly SAND, well graded, sub rounded gravel, dry	N	Some surface algae
SD110	22/08/2022	sandy CLAY, medium plasticity, dark grey, fine grained sand, wet	N	High organic content
Lavarack Golf Course & Sporting Field				
SD129	24/08/2022	SAND, medium to coarse grained, loose, brown to yellow, dry	N	Organics (leaves)
SD130	24/08/2022	SAND, medium to coarse grained, loose, brown to yellow, dry	N	Nil
Top, Middle and Lower Dams				
SD139	22/08/2022	Sandy CLAY, medium plasticity, dark brown, wet	Y	Organic odour, high organic content - leaves and plant roots
SD140	22/08/2022	gravelly SAND, fine to coarse, poorly graded, wet	N	High organic content
SD144	22/08/2022	sandy CLAY, low plasticity, fine grained sand, wet	N	Some organic content (leaves)
Remaining On-Base				
SD113	22/08/2022	gravelly SAND, well graded with sub rounded gravel, trace clay	N	Surface algae present
SD120	03/09/2022	gravelly SAND, well graded, medium grained, some medium angular to subangular gravel, brown to yellow	N	Minor organic material in sample
Base Boundary				
SD126	23/08/2022	SAND, light brown, medium grained, loose	N	Nil
SD128	23/08/2022	gravelly sandy CLAY, low plasticity, fine to coarse grained sand, fine to coarse angular gravel, moist, dark brown	N	Organic content (roots), location was dry
SD132	22/08/2022	silty CLAY, firm, medium plasticity, dark brown to black, trace fine to medium angular gravel	N	Nil
SD133	23/08/2022	gravelly sandy CLAY, grey, low plasticity, medium grained sand, fine to coarse angular gravel, dry	N	Organic content (grass and plat roots)
SD134	22/08/2022	sandy SILT, soft, black, non plastic, fine to medium sand, dry	N	Minor organic content
SD135	22/08/2022	gravelly SAND, fine to medium grained, poorly graded, wet	N	Organic content (roots)
SD136	23/08/2022	sandy CLAY, low plasticity, medium subangular sand, dark brown, high organic content	N	Upstream of a disturbed site - TCC sewer upgrade
Off-Base				
SD203	22/08/2022	SAND, loose, medium to coarse grained, light brown to yellow, wet	N	Nil
SD205	22/08/2022	gravelly SAND, poorly graded, loose, wet	N	Nil
SD211	25/08/2022	sandy CLAY, brown to black, low plasticity, fine to medium grained, wet	N	Organic content - roots and leaves
SD212	25/08/2022	gravelly SAND, brown, poorly graded, wet, some medium sub angular gravel	N	Some organic content (Plant roots and decomposed grass and leaves)
SD217	22/08/2022	sandy CLAY, firm, medium plasticity, wet, dark brown to black, fine grained sand	N	Organic content (roots and leaves)
SD220	22/08/2022	silty CLAY, grey and black, wet, medium plasticity	Y	Organic content
SD227	22/08/2022	silty SAND, light grey, fine to coarse grained	N	Nil
SD232	22/08/2022	silty CLAY, soft, medium plasticity, black, wet	N	Some organic content
SD233	22/08/2022	loamy SAND, low plasticity, dark brown, wet, fine grained sand, loose	N	Organic content - leaves
SD242	22/08/2022	sandy CALY, soft, medium plasticity, brown and black, wet, fine grained sand with some medium angular gravel	N	Nil
SD243	22/08/2022	clayey SAND, loose, fine grained, dark brown and black, low plasticity clay	N	Nil
SD244	22/08/2022	sandy GRAVEL, angular gravel, pale grey, wet	N	Nil
SD245	22/08/2022	silty SAND, pale grey, fine to coarse grained	Y	Sulfurous odour and high organic content

	4:2 FTS	6:2 FTS	8:2 FTS	10:2 FTS	EFOSA	EFOSAA	EFOSAE	FOSA	MeFOSA	MFOSAA	MeFOSE	PFBS	PFPeS	PFHxS	PFHpS	PFOS	PFDS	PFBA	PFHxA	PFPeA	PFHpA	PFOA	PFDA	PFDDA	PFNA	PFTeDA	PFTrDA	PFUnDA	Sum of PFOS and PFHxS	Sum of PFAS
Units	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	
LOR	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.05	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.00	

Location ID	Sample Date	4:2 FTS	6:2 FTS	8:2 FTS	10:2 FTS	EFOSA	EFOSAA	EFOSAE	FOSA	MeFOSA	MFOSAA	MeFOSE	PFBS	PFPeS	PFHxS	PFHpS	PFOS	PFDS	PFBA	PFHxA	PFPeA	PFHpA	PFOA	PFDA	PFDDA	PFNA	PFTeDA	PFTrDA	PFUnDA	Sum of PFOS and PFHxS	Sum of PFAS
MW106	28/10/2020	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.02	<0.05	0.05	<0.02	0.12	<0.02	0.09	<0.02	<0.1	0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	0.21	0.28
	31/03/2021	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.02	<0.05	0.08	<0.02	0.07	<0.02	0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	0.12	0.20
	18/08/2021	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.02	<0.05	0.06	0.03	0.25	<0.02	0.1	<0.02	<0.1	0.04	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	0.35	0.48
	3/03/2022	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.02	<0.05	0.06	<0.02	0.12	<0.02	0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	0.17	0.23
	25/08/2022	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.02	<0.05	0.09	<0.02	0.16	<0.02	0.09	<0.02	<0.1	0.03	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	0.25	0.37
Stockpile Designated Area 2																															
MW141	15/10/2018	<0.01	<0.01	<0.01	<0.01	<0.02	<0.01	<0.05	<0.01	<0.02	<0.01	<0.05	0.37	0.3	2.7	0.059	0.76	<0.01	0.19	0.86	0.15	0.046	0.069	<0.01	<0.01	<0.01	<0.02	<0.02	<0.01	3.46	5.50
	16/10/2018	<0.01	<0.01	<0.01	<0.01	<0.02	<0.01	<0.05	<0.01	<0.02	<0.01	<0.05	0.42	0.34	3.1	0.076	0.87	<0.01	0.13	0.81	0.14	0.047	0.097	<0.01	<0.01	<0.01	<0.02	<0.02	<0.01	3.97	6.03
	12/07/2019	<0.01	<0.01	<0.01	<0.01	<0.02	<0.01	<0.05	<0.01	<0.02	<0.01	<0.05	0.34	0.28	2.3	0.066	0.72	<0.01	0.11	0.67	0.11	0.041	0.081	<0.01	<0.01	0.019	<0.02	<0.02	<0.01	3.02	4.74
	3/12/2019	<0.01	<0.01	<0.01	<0.01	<0.02	<0.01	<0.05	<0.01	<0.02	<0.01	<0.05	0.23	0.2	1.6	0.054	0.58	<0.01	0.11	0.44	0.078	0.025	0.054	<0.01	<0.01	<0.01	<0.02	<0.02	<0.01	2.18	3.37
	3/12/2019	<0.01	<0.01	<0.01	<0.01	<0.02	<0.01	<0.05	<0.01	<0.02	<0.01	<0.05	0.23	0.19	1.5	0.055	0.59	<0.01	0.11	0.42	0.077	0.027	0.054	<0.01	<0.01	<0.01	<0.02	<0.02	<0.01	2.09	3.25
	3/12/2019	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.27	0.23	1.6	0.09	0.83	<0.01	0.11	0.52	0.09	0.04	0.1	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	2.43	3.88
	28/10/2020	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.02	<0.05	<0.02	0.27	0.24	1.68	0.07	0.64	<0.02	<0.1	0.49	0.09	0.03	0.07	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	2.32	3.58
	31/03/2021	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.02	<0.05	<0.02	0.22	0.2	1.61	0.07	0.77	<0.02	<0.1	0.48	0.1	0.04	0.07	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	2.38	3.56
	17/08/2021	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.02	<0.05	<0.02	0.13	0.1	0.78	0.03	0.37	<0.02	<0.1	0.23	0.05	<0.02	0.04	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	1.15	1.73
	3/03/2022	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.02	<0.05	<0.02	0.17	0.14	1.06	0.05	0.51	<0.02	<0.1	0.28	0.02	0.05	0.05	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	1.57	2.33
	24/08/2022	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.02	<0.05	<0.02	0.17	0.15	1.12	0.04	0.52	<0.02	<0.1	0.28	0.05	<0.02	0.04	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	1.64	2.37

Table with columns for Location ID, Sample Date, and various PFAS compounds (H2 FTS, B2 FTS, etc.) with values in ug/L. Includes sections for Suspected AFFF Disposal Area, Top, Middle and Lower Dams, Base Boundary, and Off-Base.

denotes disturbance to the well may have impacted sample integrity

Table with 26 columns for PFAS analytes and 2 columns for Sum of PFOS and PFHxS. Rows are organized by location ID (SW119, SW121, SW109, SW110, Lavarack Golf Course and Sporting Fields, Top, Middle and Lower Dams, Remaining On-Base, Base Boundary) and sample date (e.g., 16/12/2018, 29/10/2020, 29/03/2021).

Table with columns for Location ID, Sample Date, and various PFAS compounds (A2-FTS, B2-FIS, B3-FIS, I0-2 FTS, EFOFA, EFOFAA, EFOFBE, FOSA, MFOFA, MFOFAA, MFOFBE, PFBS, PFPeS, PFHxS, PFHpS, PFOS, PFDS, PFBA, PFHxA, PFPeA, PFHpA, PFDA, PFDoA, PFNA, PFTeDA, PFTtDA, PFUnDA, Sum of FOS and PFHxS, Sum of PFAS). Rows include data for locations SW203 through SW245.

Appendix C

Data Validation

DATA VALIDATION REPORT

Project No.:	60612487	Validation by:	[REDACTED]	Date:	09/11/2022
Client:	Department of Defence				
Site:	Lavarack Barracks Townsville (0229)				
Matrix type:	Groundwater, surface water, sediment	Data verified by	[REDACTED]	Date:	04/10/2022
No. of primary samples:	38 groundwater, 21 surface water, 30 sediment (August 2022), 1 sediment sample (September 2022) 1 groundwater, 1 surface water (October 2022)				
Laboratory:	ALS (Brisbane), NMI (Sydney)	Project Manager:	[REDACTED]		
Lab reference:	ET2204605, ET2204738, ET2205249, AECO06/220905 (RN1365263)				
Key Issues:	No QA/QC issues were identified in the field or laboratory datasets that could have a material implication on data interpretation and therefore decision-making on the project.				
	The data are considered appropriate for use to meet the project objectives.				
Field QA/QC					
Sampling personnel	Sampling was conducted by suitably trained and experienced AECOM personnel from 22 August 2022 to 25 August 2022, . Re-sampling was conducted by AECOM personnel on 7 October 2022				
Sampling Methodology	Samples were collected using appropriate methods as identified within the main body of the report. Hydrasleeves were installed in the well for a minimum of 24 hours prior to collection. MW235S was sampled with the use of a steel bailer due to possible presence of tree roots.				
Chain of Custody (COC)	COC documents completed as per AECOM procedures.				
Rinsate Blank	Rinsate blank samples were collected at a frequency of one per field staff per day of sampling (8 in total). No rinsate sample was collected during re-sampling (October 2022). Concentrations of all analytes tested were reported below the LOR for rinsate samples.				
Trip Blanks	Trip blank samples were submitted to the laboratory at a rate of one per batch of primary samples delivered to the laboratory (two in total). Concentrations were reported below the LOR for all analytes tested in the trip blank. Trip blanks were not submitted for batches where samples on private properties were collected. No trip blank was submitted to the laboratory with samples collected during re-sampling (October 2022)				
Eskies to Laboratory	A total of five eskies of samples in three deliveries were submitted to ALS across the sampling event. One esky was submitted to NMI.				
Frequency of field QC	Field duplicates (inter-laboratory duplicates) and triplicates (inter-laboratory duplicates) were collected at a target frequency of one in ten primary samples (four duplicates and triplicates for groundwater, two duplicates and triplicates for surface water and four duplicates and triplicates for sediment). The target frequency of 10% for field duplicates and triplicates was achieved for water and sediment.				
Handling and preservation	Primary, duplicate and triplicate samples were received preserved and chilled at the laboratory. Sample receipt temperature was reported between 2.5°C and 6.1°C. All samples were received at the laboratory in appropriate sample containers with no sample container / preservation non-compliances noted.				
Equipment Calibration	Calibration of the water quality meter was conducted each day before sampling, see Appendix F.				

Laboratory QA/QC

Tests requested/reported	Samples were analysed and reported as requested on the COC.
Holding time compliance	Samples were extracted and analysed within recommended holding times except sample 0229_SD144_220822 which was extracted 7 days past the due date. A reason for this was not provided by the laboratory.
Laboratory Accreditation	The laboratory analysis was conducted by ALS Environmental Pty Ltd (Brisbane) a National Association of Testing Authorities (NATA) accredited laboratory. The triplicate samples were analysed at the National Measurement Institute (Sydney), also a NATA accredited laboratory.
Frequency of laboratory QC	<p>The laboratory reported sufficient frequency of quality control samples to assess whether the results were reported to an acceptable accuracy and precision, except:</p> <ul style="list-style-type: none">• Laboratory duplicates for PFAS in water (9.59%) were below the expected rate of 10% in ET2204605.• Laboratory duplicates for PFAS in water (6.67%) were below the expected rate of 10% in ET2204738.• Matrix spikes for PFAS in water (0.00%) were below the expected rate of 5% in ET22004738.• Laboratory duplicates were not completed by NMI.
Method Blank	No method blank outliers were reported.
Laboratory duplicate RPDs	Laboratory duplicate Relative Percentage Differences (RPD) were within control limits for all samples with the exception of batch RN1345718, for which no laboratory duplicates were completed.
Laboratory control spike (LCS) recovery	All LCS recoveries were reported within acceptable limits.
Matrix spike recovery	The following matrix spike recoveries were reported outside the acceptable range.

Analyte	Sample ID	Recovery (%)	Comment
Sediment			
Perfluorooctane sulfonic acid (PFOS)	0229_SD133_220823	46.5	Recovery less than lower data quality objective
	0229_SD220_220822	Not Determined	Background level greater than or equal to 4x spike level.
Perfluorohexanoic acid (PFHxA)	0229_SD133_220823	60.9	Recovery less than lower data quality objective
Perfluorodecanoic acid (PFDA)	0229_SD133_220823	63.3	
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	0229_SD133_220823	57.8	
Fluorotelomer sulfonic acid (10:2 FTS)	0229_SD133_220823	67.0	
Water			
Perfluorobutane sulfonic acid (PFBS)	0229_SW232_220822	39	Recovery less than lower data quality objective
	0229_MW138_220824	Not Determined	Background level greater than or equal to 4x spike level.
Perfluoropentane sulfonic acid (PFPeS)	0229_MW138_220824	Not Determined	Background level greater than or equal to 4x spike level.
Perfluorohexane sulfonic acid (PFHxS)	0229_SW232_220822	29.5	Recovery less than lower data quality objective
	0229_MW122_220824	Not Determined	Background level greater than or equal to 4x spike level.
	0229_MW138_220824	Not Determined	
Perfluorooctane sulfonic acid (PFOS)	0229_SW232_220824	36.7	Recovery less than lower data quality objective
	0229_MW122_220824	Not Determined	Background level greater than or equal to 4x spike level.
	0229_MW138_220824		
Perfluorobutanoic acid (PFBA)	0229_MW122_220824	69.2	Recovery less than lower data quality objective
	0229_MW138_220824	52.1	
Perfluorohexanoic acid (PFHxA)	0229_MW138_220824	Not Determined	Background level greater than or equal to 4x spike level.

Surrogate spike recovery

Recovery was less than lower data quality objective for samples 0229_SD119_220822 (63%) and 0229_SD205_220822 (58.5%) for 13C4-PFOS in batch ET2204605.

QA/QC Data Evaluation

Comparison of Field Observations and Laboratory Results

Sum of PFHxS and PFOS, PFOS and PFOA concentrations at MW131 were reported higher than historic concentrations. It is noted that minor irrigation works had recently been completed nearby. MW131 was re-sampled in October 2022 to confirm results.

Data transcription

A random 10% check of the laboratory results identified no anomalies within the electronic data, the laboratory reports, and tables generated by AECOM.

Limits of reporting

Limits of Reporting (LORs) were sufficiently low to enable assessment against adopted screening levels.

LOR values were adjusted for some analytes due to high concentrations at 0229_MW131_220826, 0229_SW109_220822, 0229_MW128_220824, 0229_MW072_220825, 0229_MW074_220825 in ET204605.

LOR values for some sediment samples were raised due to high moisture content.

Field duplicate RPDs

Field duplicate RPDs were reported within control limits except (the sample with the higher concentration is in bold):

- PFOS in **0229_SD233_220822** and 0229_QC103_220822.
- PFOS in **0229_SD126_220823** and 0229_QC105_220823.

Field triplicate RPDs

Field triplicate RPDs were reported within control limits for all sample sets with the exception of the following (the sample with the higher concentration is in bold):

- PFPeS, Perfluoroheptane sulfonic acid (PFHpS), PFOS, Perfluoropentanoic acid (PFPeA), PFHxA, Perfluoroheptanoic acid (PFHpA) and PFOA in **0229_MW128_220824** and 0229_QC207_220824.
- PFHxS in **0229_MW102_220824** and 0229_QC208_220824.
- PFOS in **0229_SD233_220822** and 0229_QC203_220822.
- PFOS in 0229_SD126_220823 and **0229_QC205_220823**.

Triplicate concentrations were within the same order of magnitude compared to the concentrations in the primary sample and this is not considered to impact interpretation of results. The variability between the primary and triplicate results is inferred to be the result of slight differences in analytical methods employed by the two laboratories. This is demonstrated through the laboratory duplicate results all being within acceptable limits.

Table C1 - Groundwater Duplicate and Triplicate Results

RPD	RN1365263 0229_QC207_220824 24/08/2022 Triplicate	RPD	ET2204605 0229_MW102_220824 24/08/2022 Primary	ET2204605 0229_QC108_220824 24/08/2022 Duplicate	RPD	RN1365263 0229_QC208_220824 24/08/2022 Triplicate	RPD	ET2204605 0229_MW141_220824 24/08/2022 Primary	ET2204605 0229_QC109_220824 24/08/2022 Duplicate	RPD	RN1365263 0229_QC209_220824 24/08/2022 Triplicate	RPD
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ChemName													
Perfluorobutane sulfonic acid (PFBS)	4	12	37	0.46	0.42	9	0.43	7	0.17	0.18	6	0.16	6
Perfluoropentane sulfonic acid (PFPeS)	2	11	60	0.33	0.35	6	0.32	3	0.15	0.15	0	0.13	14
Perfluorohexane sulfonic acid (PFHxS)	1	120	30	2.11	2.13	1	1.5	34	1.12	1.15	3	1	11
Perfluoroheptane sulfonic acid (PFHpS)	0	5.3	54	0.15	0.15	0	0.12	22	0.04	0.04	0	0.031	25
Perfluorooctane sulfonic acid (PFOS)	3	100	41	1.04	1.07	3	0.88	17	0.52	0.50	4	0.49	6
Perfluorodecane sulfonic acid (PFDS)	NC	<0.01	NC	<0.02	<0.02	NC	<0.01	NC	<0.02	<0.02	NC	<0.01	NC
Perfluorobutanoic acid (PFBA)	3	2.8	7	<0.1	<0.1	NC	0.098	NC	<0.1	<0.1	NC	0.067	NC
Perfluoropentanoic acid (PFPeA)	0	5.6	33	0.11	0.10	10	0.099	11	0.05	0.05	0	0.049	2
Perfluorohexanoic acid (PFHxA)	1	26	39	0.34	0.31	9	0.29	16	0.28	0.27	4	0.25	11
Perfluoroheptanoic acid (PFHpA)	0	2.6	51	0.08	0.08	0	0.068	16	<0.02	0.02	NC	0.017	NC
Perfluorooctanoic acid (PFOA)	2	4.9	52	0.16	0.16	0	0.13	21	0.04	0.04	0	0.035	13
Perfluorononanoic acid (PFNA)	4	2.4	25	<0.02	<0.02	NC	<0.01	NC	<0.02	<0.02	NC	<0.01	NC
Perfluorodecanoic acid (PFDA)	18	0.055	10	<0.02	<0.02	NC	<0.01	NC	<0.02	<0.02	NC	<0.01	NC
Perfluoroundecanoic acid (PFUnDA)	NC	0.044	10	<0.02	<0.02	NC	<0.01	NC	<0.02	<0.02	NC	<0.01	NC
Perfluorododecanoic acid (PFDoDA)	NC	<0.01	NC	<0.02	<0.02	NC	<0.01	NC	<0.02	<0.02	NC	<0.01	NC
Perfluorotridecanoic acid (PFTrDA)	NC	<0.02	NC	<0.02	<0.02	NC	<0.02	NC	<0.02	<0.02	NC	<0.02	NC
Perfluorotetradecanoic acid (PFTeDA)	NC	<0.02	NC	<0.05	<0.05	NC	<0.02	NC	<0.05	<0.05	NC	<0.02	NC
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	NC	<0.01	NC	<0.05	<0.05	NC	<0.01	NC	<0.05	<0.05	NC	<0.01	NC
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	22	0.11	32	<0.05	<0.05	NC	0.011	NC	<0.05	<0.05	NC	<0.01	NC
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	NC	0.019	NC	<0.05	<0.05	NC	<0.01	NC	<0.05	<0.05	NC	<0.01	NC
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	NC	<0.01	NC	<0.05	<0.05	NC	<0.01	NC	<0.05	<0.05	NC	<0.01	NC
Perfluorooctane sulfonamide (FOSA)	0	0.16	13	<0.02	<0.02	NC	<0.01	NC	<0.02	<0.02	NC	<0.01	NC
N-Methyl perfluorooctane sulfonamide (MeFOSA)	NC	<0.02	NC	<0.05	<0.05	NC	<0.02	NC	<0.05	<0.05	NC	<0.02	NC
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	NC	<0.01	NC	<0.02	<0.02	NC	<0.01	NC	<0.02	<0.02	NC	<0.01	NC
N-methyl perfluorooctane sulfonamidoethanol (MeFOSE)	NC	<0.05	NC	<0.05	<0.05	NC	<0.05	NC	<0.05	<0.05	NC	<0.05	NC
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	NC	<0.02	NC	<0.05	<0.05	NC	<0.02	NC	<0.05	<0.05	NC	<0.02	NC
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	NC	<0.01	NC	<0.02	<0.02	NC	<0.01	NC	<0.02	<0.02	NC	<0.01	NC
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	NC	<0.05	NC	<0.05	<0.05	NC	<0.05	NC	<0.05	<0.05	NC	<0.05	NC

*RPDs have only been considered where a concentration is greater than 1 times the EQL.

**High RPDs are in bold (Acceptable RPDs for each EQL multiplier range are: 100 (1-10 x EQL); 50 (10-20 x EQL); 30 (> 20 x EQL))

Table C2 - Surface Water Duplicate and Triplicate Results

Lab Report Number	ET2204605	ET2204605	RPD	RN1365263	RPD	ET2204605	ET2204605	RPD	RN1365263	RPD
Field ID	0229_SW217_220822	0229_QC101_220822		0229_QC201_220822		0229_SW233_220822	0229_QC104_220822		0229_QC204_220823	
Sampled Date/Time	22/08/2022	22/08/2022		22/08/2022		22/08/2022	22/08/2022		23/08/2022	
Sample Type	Primary	Duplicate		Triplicate		Primary	Duplicate		Triplicate	

ChemName	Units	EQL										
Perfluorobutane sulfonic acid (PFBS)	µg/L	0.01	<0.02	<0.02	NC	0.011	NC	0.13	0.13	0	0.13	0
Perfluoropentane sulfonic acid (PFPeS)	µg/L	0.01	<0.02	<0.02	NC	<0.01	NC	0.09	0.09	0	0.1	11
Perfluorohexane sulfonic acid (PFHxS)	µg/L	0.01	0.02	0.01	67	0.011	58	0.68	0.67	1	0.78	14
Perfluoroheptane sulfonic acid (PFHpS)	µg/L	0.01	<0.02	<0.02	NC	<0.01	NC	0.04	0.04	0	0.026	42
Perfluorooctane sulfonic acid (PFOS)	µg/L	0.01	0.02	<0.01	NC	<0.02	NC	0.68	0.66	3	0.63	8
Perfluorodecane sulfonic acid (PFDS)	µg/L	0.01	<0.02	<0.02	NC	<0.01	NC	<0.02	<0.02	NC	<0.01	NC
Perfluorobutanoic acid (PFBA)	µg/L	0.05	<0.1	<0.1	NC	<0.05	NC	<0.1	<0.1	NC	<0.05	NC
Perfluoropentanoic acid (PFPeA)	µg/L	0.02	<0.02	<0.02	NC	<0.02	NC	0.04	0.04	0	0.035	13
Perfluorohexanoic acid (PFHxA)	µg/L	0.01	<0.02	<0.02	NC	<0.01	NC	0.15	0.16	6	0.16	6
Perfluoroheptanoic acid (PFHpA)	µg/L	0.01	<0.02	<0.02	NC	<0.01	NC	0.02	0.02	0	0.019	5
Perfluorooctanoic acid (PFOA)	µg/L	0.01	<0.01	<0.01	NC	<0.01	NC	0.05	0.04	22	0.045	11
Perfluorononanoic acid (PFNA)	µg/L	0.01	<0.02	<0.02	NC	<0.01	NC	<0.02	<0.02	NC	<0.01	NC
Perfluorodecanoic acid (PFDA)	µg/L	0.01	<0.02	<0.02	NC	<0.01	NC	<0.02	<0.02	NC	<0.01	NC
Perfluoroundecanoic acid (PFUnDA)	µg/L	0.01	<0.02	<0.02	NC	<0.01	NC	<0.02	<0.02	NC	<0.01	NC
Perfluorododecanoic acid (PFDoDA)	µg/L	0.01	<0.02	<0.02	NC	<0.01	NC	<0.02	<0.02	NC	<0.01	NC
Perfluorotridecanoic acid (PFTriDA)	µg/L	0.02	<0.02	<0.02	NC	<0.02	NC	<0.02	<0.02	NC	<0.02	NC
Perfluorotetradecanoic acid (PFTeDA)	µg/L	0.02	<0.05	<0.05	NC	<0.02	NC	<0.05	<0.05	NC	<0.02	NC
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	µg/L	0.01	<0.05	<0.05	NC	<0.01	NC	<0.05	<0.05	NC	<0.01	NC
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	µg/L	0.01	<0.05	<0.05	NC	<0.01	NC	<0.05	<0.05	NC	<0.01	NC
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	µg/L	0.01	<0.05	<0.05	NC	<0.01	NC	<0.05	<0.05	NC	<0.01	NC
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	µg/L	0.01	<0.05	<0.05	NC	<0.01	NC	<0.05	<0.05	NC	<0.01	NC
Perfluorooctane sulfonamide (FOSA)	µg/L	0.01	<0.02	<0.02	NC	<0.01	NC	<0.02	<0.02	NC	<0.01	NC
N-Methyl perfluorooctane sulfonamide (MeFOSA)	µg/L	0.02	<0.05	<0.05	NC	<0.02	NC	<0.05	<0.05	NC	<0.02	NC
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	µg/L	0.01	<0.02	<0.02	NC	<0.01	NC	<0.02	<0.02	NC	<0.01	NC
N-methyl perfluorooctane sulfonamidoethanol (MeFOSE)	µg/L	0.05	<0.05	<0.05	NC	<0.05	NC	<0.05	<0.05	NC	<0.05	NC
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	µg/L	0.02	<0.05	<0.05	NC	<0.02	NC	<0.05	<0.05	NC	<0.02	NC
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	µg/L	0.01	<0.02	<0.02	NC	<0.01	NC	<0.02	<0.02	NC	<0.01	NC
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	µg/L	0.05	<0.05	<0.05	NC	<0.05	NC	<0.05	<0.05	NC	<0.05	NC

*RPDs have only been considered where a concentration is greater than 1 times the EQL.
 **High RPDs are in bold (Acceptable RPDs for each EQL multiplier range are: 100 (1-10 x EQL); 50 (10-20 x EQL); 30 (> 20 x EQL))

Lab Report Number	ET2204605	ET2204605		RN1365263		ET2204605	ET2204605		RN1365263		ET2204605	ET2204605		RN1365263		ET2204605
Field ID	0229_SD217_220822	0229_QC100_220822		0229_QC200_220822		0229_SD129_220822	0229_QC102_220822		0229_QC202_220822		0229_SD233_220822	0229_QC103_220822		0229_QC203_220822		0229_SD126_220823
Sampled Date/Time	22/08/2022	22/08/2022		22/08/2022		22/08/2022	22/08/2022		22/08/2022		22/08/2022	22/08/2022		22/08/2022		23/08/2022
Sample Type	Primary	Duplicate	RPD	Triplicate	RPD	Primary	Duplicate	RPD	Triplicate	RPD	Primary	Duplicate	RPD	Triplicate	RPD	Primary

ChemName	Units	EQL																
Perfluorobutane sulfonic acid (PFBS)	mg/kg	0.0002	0.0002	<0.0002	NC	<0.001	NC	0.0002	<0.0002	NC	<0.001	NC	<0.0002	<0.0002	NC	<0.001	NC	<0.0002
Perfluoropentane sulfonic acid (PFPeS)	mg/kg	0.0002	<0.0002	<0.0002	NC	<0.001	NC	<0.0002	<0.0002	NC	<0.001	NC	<0.0002	<0.0002	NC	<0.001	NC	<0.0002
Perfluorohexane sulfonic acid (PFHxS)	mg/kg	0.0002	0.0002	0.0002	0	<0.001	NC	0.0003	0.0002	40	<0.001	NC	0.0020	0.0015	29	0.0012	50	0.0002
Perfluoroheptane sulfonic acid (PFHpS)	mg/kg	0.0002	<0.0002	<0.0002	NC	<0.001	NC	<0.0002	<0.0002	NC	<0.001	NC	<0.0002	<0.0002	NC	<0.001	NC	<0.0002
Perfluorooctane sulfonic acid (PFOS)	mg/kg	0.0002	0.0018	0.0018	0	<0.002	NC	0.0009	0.0010	11	<0.002	NC	0.0184	0.0099	60	0.0071	89	0.0034
Perfluorodecane sulfonic acid (PFDS)	mg/kg	0.0002	<0.0002	<0.0002	NC	<0.001	NC	<0.0002	<0.0002	NC	<0.001	NC	<0.0002	<0.0002	NC	<0.001	NC	<0.0002
Perfluorobutanoic acid (PFBA)	mg/kg	0.001	<0.001	<0.001	NC	<0.002	NC	<0.001	<0.001	NC	<0.002	NC	<0.001	<0.001	NC	<0.002	NC	<0.001
Perfluoropentanoic acid (PFPeA)	mg/kg	0.0002	<0.0002	<0.0002	NC	<0.002	NC	<0.0002	<0.0002	NC	<0.002	NC	<0.0002	<0.0002	NC	<0.002	NC	<0.0002
Perfluorohexanoic acid (PFHxA)	mg/kg	0.0002	<0.0002	<0.0002	NC	<0.001	NC	<0.0002	<0.0002	NC	<0.001	NC	0.0003	<0.0002	NC	<0.001	NC	<0.0002
Perfluoroheptanoic acid (PFHpA)	mg/kg	0.0002	<0.0002	<0.0002	NC	<0.001	NC	<0.0002	<0.0002	NC	<0.001	NC	<0.0002	<0.0002	NC	<0.001	NC	<0.0002
Perfluorooctanoic acid (PFOA)	mg/kg	0.0002	<0.0002	<0.0002	NC	<0.001	NC	<0.0002	<0.0002	NC	<0.001	NC	<0.0002	<0.0002	NC	<0.001	NC	<0.0002
Perfluorononanoic acid (PFNA)	mg/kg	0.0002	<0.0002	<0.0002	NC	<0.001	NC	<0.0002	<0.0002	NC	<0.001	NC	<0.0002	<0.0002	NC	<0.001	NC	<0.0002
Perfluorodecanoic acid (PFDA)	mg/kg	0.0002	<0.0002	<0.0002	NC	<0.001	NC	<0.0002	<0.0002	NC	<0.001	NC	<0.0002	<0.0002	NC	<0.001	NC	<0.0002
Perfluoroundecanoic acid (PFUnDA)	mg/kg	0.0002	<0.0002	<0.0002	NC	<0.002	NC	<0.0002	<0.0002	NC	<0.002	NC	<0.0002	<0.0002	NC	<0.002	NC	0.0003
Perfluorododecanoic acid (PFDoDA)	mg/kg	0.0002	<0.0002	<0.0002	NC	<0.002	NC	<0.0002	<0.0002	NC	<0.002	NC	0.0003	0.0004	29	<0.002	NC	<0.0002
Perfluorotridecanoic acid (PFTriDA)	mg/kg	0.0002	<0.0002	<0.0002	NC	<0.002	NC	<0.0002	<0.0002	NC	<0.002	NC	<0.0002	<0.0002	NC	<0.002	NC	0.0002
Perfluorotetradecanoic acid (PFTeDA)	mg/kg	0.0005	<0.0005	<0.0005	NC	<0.002	NC	<0.0005	<0.0005	NC	<0.002	NC	<0.0005	<0.0005	NC	<0.002	NC	<0.0005
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	mg/kg	0.0005	<0.0005	<0.0005	NC	<0.001	NC	<0.0005	<0.0005	NC	<0.001	NC	<0.0005	<0.0005	NC	<0.001	NC	<0.0005
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	mg/kg	0.0005	<0.0005	<0.0005	NC	<0.001	NC	<0.0005	<0.0005	NC	<0.001	NC	<0.0005	<0.0005	NC	<0.001	NC	<0.0005
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	mg/kg	0.0005	<0.0005	<0.0005	NC	<0.001	NC	<0.0005	<0.0005	NC	<0.001	NC	<0.0005	<0.0005	NC	<0.001	NC	<0.0005
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	mg/kg	0.0005	<0.0005	<0.0005	NC	<0.002	NC	<0.0005	<0.0005	NC	<0.002	NC	<0.0005	<0.0005	NC	<0.002	NC	<0.0005
Perfluorooctane sulfonamide (FOSA)	mg/kg	0.0002	<0.0002	<0.0002	NC	<0.001	NC	<0.0002	<0.0002	NC	<0.001	NC	<0.0002	<0.0002	NC	<0.001	NC	<0.0002
N-Methyl perfluorooctane sulfonamide (MeFOSA)	mg/kg	0.0005	<0.0005	<0.0005	NC	<0.002	NC	<0.0005	<0.0005	NC	<0.002	NC	<0.0005	<0.0005	NC	<0.002	NC	<0.0005
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	mg/kg	0.0002	<0.0002	<0.0002	NC	<0.002	NC	<0.0002	<0.0002	NC	<0.002	NC	<0.0002	<0.0002	NC	<0.002	NC	<0.0002
N-methyl perfluorooctane sulfonamidoethanol (MeFOSE)	mg/kg	0.0005	<0.0005	<0.0005	NC	<0.005	NC	<0.0005	<0.0005	NC	<0.005	NC	<0.0005	<0.0005	NC	<0.005	NC	<0.0005
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	mg/kg	0.0005	<0.0005	<0.0005	NC	<0.002	NC	<0.0005	<0.0005	NC	<0.002	NC	<0.0005	<0.0005	NC	<0.002	NC	<0.0005
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	mg/kg	0.0002	<0.0002	<0.0002	NC	<0.002	NC	<0.0002	<0.0002	NC	<0.002	NC	<0.0002	<0.0002	NC	<0.002	NC	<0.0002
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	mg/kg	0.0005	<0.0005	<0.0005	NC	<0.005	NC	<0.0005	<0.0005	NC	<0.005	NC	<0.0005	<0.0005	NC	<0.005	NC	<0.0005

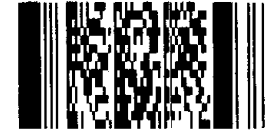
*RPDs have only been considered where a concentration is greater than 1 times the EQL.
**High RPDs are in bold (Acceptable RPDs for each EQL multiplier range are: 100 (1-10 x EQL); 50 (10-20 x EQL); 30 (> 20 x EQL))

Appendix D

Chain of Custody Records



Environmental Division
Townsville
Work Order Reference
ET2204605



Telephone: + 61 7 4773 0006

Custody Document for Submissions via ALS Compass App

Project: 606 12487 Client: [Redacted] Project Manager: [Redacted]
Phone: (_____)

ALS Compass COC Reference: _____ # Samples: _____ Sampler: _____
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: [Redacted]
Date / Time: <u>26-8-22</u> <u>14:15</u>	Date / Time: <u>26/8/22</u> <u>14:15</u>	Date / Time:	Date / Time: <u>30/8/22</u> <u>E 8:30</u>



CHAIN OF CUSTODY

COC#: 41522 ALS Laboratory, ET Townsville

RELINQUISHED BY:

RECEIVED BY:

RELINQUISHED BY:

RECEIVED BY:

DATE TIME:

DATE TIME:

DATE TIME:

DATE TIME: 30/8/22

CLIENT:

PROJECT: QLD_0229_PFASOMP_20

SITE: QLD_0229

ORDER NO:

PROJECT MANAGER:

PRIMARY SAMPLER:

EMAIL REPORTS TO:

EMAIL INVOICES TO:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

CONTACT PH:

QUOTE NO: TV/007/21 - Compass

SAMPLER MOBILE:

ET2021AECOMAU000
1

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	ANALYSIS REQUIRED			ADDITIONAL INFORMATION
							Sediments SEDIMENT	Waters WATER	ALTERNATIVE ANALYSIS	
001	0229_SD136_220823		26/08/2022 10:32 AM	Soil	ALS: 1 Non ALS: 0	No	Partial 1/4			
002	0229_SD133_220823		26/08/2022 10:31 AM	Soil	ALS: 1 Non ALS: 0	No	Partial 1/4			
003	0229_SD128_220823		23/08/2022 10:54 AM	Soil	ALS: 1 Non ALS: 0	No	Partial 1/4			Contamination: Previous results
004	0229_SD126_220823		23/08/2022 11:20 AM	Soil	ALS: 1 Non ALS: 0	No	Partial 1/4			Contamination: Previous results
005	0229_QC105_220823		23/08/2022 11:21 AM	Soil	ALS: 1 Non ALS: 0	No	Partial 1/4			Contamination: Previous results
006	0229_SW233_220823		23/08/2022 11:45 AM	Water	ALS: 2 Non ALS: 0	No		Partial 1/4		
007	0229_QC104_220823		23/08/2022 11:45 AM	Water	ALS: 2 Non ALS: 0	No		Partial 1/4		
008	0229_SD245_220823		23/08/2022 09:10 AM	Soil	ALS: 1 Non ALS: 0	No	Partial 1/4			Contamination: Previous results
009	0229_SW245_220823		23/08/2022 09:10 AM	Water	ALS: 2 Non ALS: 0	No		Partial 1/4		

**CHAIN OF CUSTODY**

COC#: 41522 ALS Laboratory: ET Townsville

RELINQUISHED BY:

RECEIVED BY:

RELINQUISHED BY:

RECEIVED BY:

DATE TIME:

DATE TIME:

DATE TIME:

DATE TIME:

CLIENT:

PROJECT: QLD_0229_PFSOMP_20

SITE: QLD_0229

ORDER NO:

PROJECT MANAGER:

PRIMARY SAMPLER:

EMAIL REPORTS TO:

EMAIL INVOICES TO:

TURNAROUND REQUIREMENTS: 5 Days

Biohazard info:

CONTACT PH:

SAMPLER MOBILE:

QUOTE NO: TV/007/21 - Compass

/ ET2021AECOMAU000

1

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:

30/8/22 @ 8:30

SAMPLE DETAILS**ANALYSIS REQUIRED**

SAMPLE	NAME	DESCRIPTION	DATE / TIME	MATRIX	TOTAL BOTTLES	ON HOLD	Sediments SEDIMENT		Waters WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
010	0229_SD244_220823		23/08/2022 10:30 AM	Soil	ALS: 1 Non ALS: 0	No	Partial 1/4				
011	0229_SW244_220823		23/08/2022 10:30 AM	Water	ALS: 2 Non ALS: 0	No		Partial 1/4			
012	0229_SD227_220823		23/08/2022 11:40 AM	Soil	ALS: 1 Non ALS: 0	No	Partial 1/4				
013	0229_SW227_220823		23/08/2022 11:40 AM	Water	ALS: 2 Non ALS: 0	No		Partial 1/4			
014	0229_SW109_220822		22/08/2022 12:30 PM	Water	ALS: 2 Non ALS: 0	No		Partial 1/4			
015	0229_SD109_220822		22/08/2022 12:30 PM	Soil	ALS: 1 Non ALS: 0	No	Partial 1/4				
016	0229_SW110_220822		22/08/2022 01:37 PM	Water	ALS: 2 Non ALS: 0	No		Partial 1/4			
017	0229_SD110_220822		22/08/2022 01:37 PM	Soil	ALS: 1 Non ALS: 0	No	Partial 1/4				
018	0229_SW113_220822		22/08/2022 12:20 PM	Water	ALS: 2 Non ALS: 0	No		Partial 1/4			

**CHAIN OF CUSTODY**

COC#: 41522 ALS Laboratory, ET Townsville

RELINQUISHED BY:

RECEIVED BY:

RELINQUISHED BY:

RECEIVED BY: [Redacted]

DATE TIME:

DATE TIME:

DATE TIME:

DATE TIME: 30/8/22

CLIENT: [Redacted]

PROJECT: QLD_0229_PFASOMP_20

SITE: QLD_0229

ORDER NO:

PROJECT MANAGER: [Redacted]

PRIMARY SAMPLER: [Redacted]

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:

CONTACT PH:

SAMPLER MOBILE:

QUOTE NO: TV/007/21 - Compass

/ ET2021AECOMAU000
1**SAMPLE DETAILS****ANALYSIS REQUIRED**

SAMPLE	NAME	DESCRIPTION	DATE / TIME	MATRIX	TOTAL BOTTLES	ON HOLD	ANALYSIS REQUIRED			ADDITIONAL INFORMATION
							Sediments SEDIMENT	Waters WATER	ALTERNATIVE ANALYSIS	
019	0229_SW110_220822		22/08/2022 12:10 PM	Soil	ALS: 1 Non ALS: 0	No	Partial 1/4			
020	0229_SD119_220822		22/08/2022 12:02 PM	Soil	ALS: 1 Non ALS: 0	No	Partial 1/4			
021	0229_SW121_220822		22/08/2022 11:04 PM	Water	ALS: 2 Non ALS: 0	No		Partial 1/4		
022	0229_SD129_220822		22/08/2022 02:55 PM	Soil	ALS: 1 Non ALS: 0	No	Partial 1/4			
023	0229_SD130_220822		22/08/2022 02:45 PM	Soil	ALS: 1 Non ALS: 0	No	Partial 1/4			
024	0229_SW132_220822		22/08/2022 02:30 PM	Soil	ALS: 1 Non ALS: 0	No	Partial 1/4			
025	0229_SW134_220822		22/08/2022 02:15 PM	Soil	ALS: 1 Non ALS: 0	No	Partial 1/4			
026	0229_SW135_220822		22/08/2022 11:55 AM	Water	ALS: 2 Non ALS: 0	No		Partial 1/4		
027	0229_SD139_220822		22/08/2022 01:40 PM	Soil	ALS: 1 Non ALS: 0	No	Partial 1/4			

**CHAIN OF CUSTODY**

COC#: 41522 ALS Laboratory: ET Townsville

RELINQUISHED BY:

RECEIVED BY:

RELINQUISHED BY:

RECEIVED BY:

DATE TIME:

DATE TIME:

DATE TIME:

DATE TIME:

30/8/22
@ 8:30

CLIENT:

PROJECT: QLD_0229_PFASOMP_20

SITE: QLD_0229

ORDER NO:

PROJECT MANAGER:

PRIMARY SAMPLER:

EMAIL REPORTS TO:

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:

CONTACT PH:

SAMPLER MOBILE:

QUOTE NO: TV/007/21 - Compass

/ ET2021AECOMAU000

1

SAMPLE DETAILS							ANALYSIS REQUIRED			
SAMPLE	NAME	DESCRIPTION	DATE / TIME	MATRIX	TOTAL BOTTLES	ON HOLD	Sediments SEDIMENT	Waters WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
028	0229_SW139_220822		22/08/2022 01:40 PM	Water	ALS: 2 Non ALS: 0	No		Partial 1/4		
029	0229_SD144_220822		22/08/2022 01:48 PM	Soil	ALS: 1 Non ALS: 0	No	Partial 1/4			
050	0229_SW140_220822		22/08/2022 01:40 PM	Water	ALS: 2 Non ALS: 0	No		Partial 1/4		
031	0229_SW217_220822		22/08/2022 11:20 AM	Water	ALS: 2 Non ALS: 0	No		Partial 1/4		
032	0229_SW205_220822		22/08/2022 03:50 PM	Water	ALS: 2 Non ALS: 0	No		Partial 1/4		
033	0229_SD205_220822		22/08/2022 03:50 PM	Soil	ALS: 1 Non ALS: 0	No	Partial 1/4			
034	0229_SD217_220822		22/08/2022 11:20 AM	Soil	ALS: 1 Non ALS: 0	No	Partial 1/4			
035	0229_SD203_220822		22/08/2022 12:05 PM	Soil	ALS: 1 Non ALS: 0	No	Partial 1/4			
036	0229_SD220_220822		22/08/2022 04:10 PM	Soil	ALS: 1 Non ALS: 0	No	Partial 1/4			

**CHAIN OF CUSTODY**

COC#: 41522 ALS Laboratory: ET Townsville

RELINQUISHED BY:

RECEIVED BY:

RELINQUISHED BY:

RECEIVED BY: [REDACTED]

DATE TIME:

DATE TIME:

DATE TIME:

DATE TIME: 30/8/22

CLIENT: [REDACTED]

PROJECT: QLD_0229_PFASOMP_20

SITE: QLD_0229

ORDER NO:

PROJECT MANAGER: [REDACTED]

PRIMARY SAMPLER: [REDACTED]

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:

CONTACT PH:

SAMPLER MOBILE:

QUOTE NO: TV/007/21 - Compass

/ ET2021AECOMAU000

1

SAMPLE DETAILS**ANALYSIS REQUIRED**

SAMPLE	NAME	DESCRIPTION	DATE / TIME	MATRIX	TOTAL BOTTLES	ON HOLD	ANALYSIS REQUIRED			ADDITIONAL INFORMATION
							Sediments SEDIMENT	Waters WATER	ALTERNATIVE ANALYSIS	
037	0229_QC100_220822		22/08/2022 12:00 PM	Soil	ALS: 1 Non ALS: 0	No	Partial 1/4			
038	0229_QC102_220822		22/08/2022 12:00 PM	Soil	ALS: 1 Non ALS: 0	No	Partial 1/4			
039	0229_QC103_220822		22/08/2022 12:00 PM	Soil	ALS: 1 Non ALS: 0	No	Partial 1/4			
040	0229_QC301_220822		22/08/2022 05:00 PM	Water	ALS: 2 Non ALS: 0	No		Partial 1/4		
041	0229_QC500_220822		22/08/2022 10:00 AM	Water	ALS: 2 Non ALS: 0	No		Partial 1/4		
042	0229_QC101_220822		22/08/2022 12:00 PM	Water	ALS: 2 Non ALS: 0	No		Partial 1/4		
043	0229_QC300_220822		22/08/2022 04:20 PM	Water	ALS: 2 Non ALS: 0	No		Partial 1/4		
044	0229_SW243_220822		22/08/2022 12:40 PM	Water	ALS: 4 Non ALS: 0	No		Partial 1/4		Extra vol lab qc
045	0229_SD243_220822		22/08/2022 12:40 PM	Soil	ALS: 1 Non ALS: 0	No	Partial 1/4			



CHAIN OF CUSTODY

COC#: 41522 ALS Laboratory: ET Townsville

RELINQUISHED BY:

RECEIVED BY:

RELINQUISHED BY:

RECEIVED BY: [Redacted]

DATE TIME:

DATE TIME:

DATE TIME:

DATE TIME: 30/8/22 @ 8:30

CLIENT: [Redacted]

PROJECT: QLD_0229_PFSOMP_20

SITE: QLD_0229

ORDER NO:

PROJECT MANAGER: [Redacted]

PRIMARY SAMPLER: [Redacted]

EMAIL REPORTS TO: [Redacted]

EMAIL INVOICES TO: [Redacted]

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

CONTACT PH:

QUOTE NO: TV/007/21 - Compass

SAMPLER MOBILE:

/ ET2021AECOMAU000
1

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	ANALYSIS REQUIRED			ADDITIONAL INFORMATION
							Sediments SEDIMENT	Waters WATER	ALTERNATIVE ANALYSIS	
046	0229_SW242_220822		22/08/2022 01:45 PM	Water	ALS: 2 Non ALS: 0	No		Partial 1/4		
047	0229_SD242_220822		22/08/2022 01:45 PM	Soil	ALS: 1 Non ALS: 0	No	Partial 1/4			
048	0229_SD233_220822		22/08/2022 03:25 PM	Soil	ALS: 1 Non ALS: 0	No	Partial 1/4			
049	0229_SD232_220822		22/08/2022 01:10 PM	Soil	ALS: 1 Non ALS: 0	No	Partial 1/4			
050	0229_SW232_220822		22/08/2022 01:10 PM	Water	ALS: 4 Non ALS: 0	No		Partial 1/4		Extra vol lab qc
051	0229_SW220_220822		22/08/2022 04:10 PM	Water	ALS: 4 Non ALS: 0	No		Partial 1/4		Extra vol lab qc
052	0229_SW203_220822		22/08/2022 12:05 PM	Water	ALS: 4 Non ALS: 0	No		Partial 1/4		Extra vol lab qc
053	0229_QC302_220823		23/08/2022 05:00 PM	Water	ALS: 2 Non ALS: 0	No		Partial 1/4		
054	0229_MW125S_220824		24/08/2022 08:51 AM	Water	ALS: 4 Non ALS: 0	No		Partial 1/4		Extra vol lab qc

**CHAIN OF CUSTODY**

COC#: 41522 ALS Laboratory: ET Townsville

RELINQUISHED BY:
DATE TIME:RECEIVED BY:
DATE TIME:RELINQUISHED BY:
DATE TIME:RECEIVED BY: [REDACTED]
DATE TIME: 20/8/22
(882)CLIENT: [REDACTED]
PROJECT: QLD_0229_PFA_SOMP_20
SITE: QLD_0229
ORDER NO:
PROJECT MANAGER: [REDACTED]
PRIMARY SAMPLER: [REDACTED]
EMAIL REPORTS TO: [REDACTED]
EMAIL INVOICES TO: [REDACTED]TURNAROUND REQUIREMENTS : 5 Days
Biohazard info:CONTACT PH: SAMPLER MOBILE:
QUOTE NO: TV/007/21 - Compass / ET2021AECOMAU000
1**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	Sediments SEDIMENT	Waters WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
055	0229_MW125I_220824		24/08/2022 08:52 AM	Water	ALS: 2 Non ALS: 0	No		Partial 1/4		
056	0229_MW124_220824		24/08/2022 09:01 AM	Water	ALS: 2 Non ALS: 0	No		Partial 1/4		
057	0229_MW123I_220824		24/08/2022 09:18 AM	Water	ALS: 4 Non ALS: 0	No		Partial 1/4		Extra vol lab qc
058	0229_MW105_220824		24/08/2022 10:00 AM	Water	ALS: 4 Non ALS: 0	No		Partial 1/4		Extra vol lab qc
059	0229_MW217_220824		24/08/2022 09:19 AM	Water	ALS: 2 Non ALS: 0	No		Partial 1/4		
060	0229_MW212_220824		24/08/2022 09:58 AM	Water	ALS: 2 Non ALS: 0	No		Partial 1/4		
061	0229_QC106_220824		24/08/2022 09:59 AM	Water	ALS: 2 Non ALS: 0	No		Partial 1/4		
062	0229_MW128_220824		24/08/2022 10:09 AM	Water	ALS: 2 Non ALS: 0	No		Partial 1/4		
063	0229_QC107_220824		24/08/2022 10:10 AM	Water	ALS: 2 Non ALS: 0	No		Partial 1/4		

**CHAIN OF CUSTODY**

COC#: 41522 ALS Laboratory: ET Townsville

RELINQUISHED BY:

RECEIVED BY:

RELINQUISHED BY:

RECEIVED BY:

DATE TIME:

DATE TIME:

DATE TIME:

DATE TIME:

CLIENT:

PROJECT: QLD_0229_PFASOMP_20

SITE: QLD_0229

ORDER NO:

PROJECT MANAGER:

PRIMARY SAMPLER:

EMAIL REPORTS TO:

EMAIL INVOICES TO:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

CONTACT PH:

QUOTE NO: TV/007/21 - Compass

SAMPLER MOBILE:

/ ET2021AECOMAU000
1**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	Sediments SEDIMENT	Waters WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
064	0229_MW102_220824		24/08/2022 10:25 AM	Water	ALS: 2 Non ALS: 0	No		Partial 1/4		
065	0229_MW233_220824		24/08/2022 10:17 AM	Water	ALS: 2 Non ALS: 0	No		Partial 1/4		
066	0229_QC108_220824		24/08/2022 10:26 AM	Water	ALS: 2 Non ALS: 0	No		Partial 1/4		
067	0229_MW003_220824		24/08/2022 10:34 AM	Water	ALS: 2 Non ALS: 0	No		Partial 1/4		
068	0229_MW220S_220824		24/08/2022 10:51 AM	Water	ALS: 2 Non ALS: 0	No		Partial 1/4		
069	0229_MW122_220824		24/08/2022 11:08 AM	Water	ALS: 4 Non ALS: 0	No		Partial 1/4		Extra vol lab qc
070	0229_MW121_220824		24/08/2022 11:20 AM	Water	ALS: 2 Non ALS: 0	No		Partial 1/4		
071	0229_MW101_220824		24/08/2022 11:43 AM	Water	ALS: 2 Non ALS: 0	No		Partial 1/4		
072	0229_MW141_220824		24/08/2022 12:35 PM	Water	ALS: 2 Non ALS: 0	No		Partial 1/4		

**CHAIN OF CUSTODY**

COC#: 41522

ALS Laboratory: ET Townsville

RELINQUISHED BY:

RECEIVED BY:

RELINQUISHED BY:

RECEIVED

DATE TIME:

DATE TIME:

DATE TIME:

DATE TIME:

CLIENT:

PROJECT: QLD_0229_PFASOMP_20

SITE: QLD_0229

ORDER NO:

PROJECT MANAGER:

PRIMARY SAMPLER:

EMAIL REPORTS TO:

EMAIL INVOICES TO:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

CONTACT PH:

QUOTE NO: TV/007/21 - Compass

SAMPLER MOBILE:

/ ET2021AECOMAU000
1**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:

31/8/22

@ 45.30

SAMPLE DETAILS**ANALYSIS REQUIRED**

SAMPLE	NAME	DESCRIPTION	DATE / TIME	MATRIX	TOTAL BOTTLES	ON HOLD	ANALYSIS REQUIRED			ADDITIONAL INFORMATION
							Sediments / SEDIMENT	Waters / WATER	ALTERNATIVE ANALYSIS	
073	0229_MW116_220824		24/08/2022 11:38 AM	Water	ALS: 2 Non ALS: 0	No		Partial 1/4		
074	0229_MW115_220824		24/08/2022 12:03 PM	Water	ALS: 4 Non ALS: 0	No		Partial 1/4		Extra vol for lab QC
075	0229_QC109_220824		24/08/2022 12:41 PM	Water	ALS: 2 Non ALS: 0	No		Partial 1/4		
076	0229_MW118_220824		24/08/2022 01:08 PM	Water	ALS: 4 Non ALS: 0	No		Partial 1/4		Extra vol for lab QC
077	0229_MW119_220824		24/08/2022 01:30 PM	Water	ALS: 2 Non ALS: 0	No		Partial 1/4		Contamination: Previous results
078	0229_MW135_220824		24/08/2022 02:00 PM	Water	ALS: 2 Non ALS: 0	No		Partial 1/4		
079	0229_MW114_220824		24/08/2022 02:25 PM	Water	ALS: 2 Non ALS: 0	No		Partial 1/4		
080	0229_MW120_220824		24/08/2022 02:35 PM	Water	ALS: 2 Non ALS: 0	No		Partial 1/4		
081	0229_MW236S_220824		24/08/2022 02:41 PM	Water	ALS: 2 Non ALS: 0	No		Partial 1/4		

**CHAIN OF CUSTODY**

COC#: 41522 ALS Laboratory: ET Townsville

RELINQUISHED BY:

RECEIVED BY:

RELINQUISHED BY:

RECEIVED BY:

DATE TIME:

DATE TIME:

DATE TIME:

DATE TIME:

CLIENT:

PROJECT: QLD_0229_PFASOMP_20

SITE: QLD_0229

ORDER NO:

PROJECT MANAGER:

PRIMARY SAMPLER:

EMAIL REPORTS TO:

EMAIL INVOICES TO:

TURNAROUND REQUIREMENTS: 5 Days

Biohazard info:

CONTACT PH:

QUOTE NO: TV/007/21 - Compass

SAMPLER MOBILE:

/ ET2021AECOMAU000
1**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:

30/8/22
[Signature]**SAMPLE DETAILS****ANALYSIS REQUIRED**

SAMPLE	NAME	DESCRIPTION	DATE / TIME	MATRIX	TOTAL BOTTLES	ON HOLD	ANALYSIS REQUIRED			ADDITIONAL INFORMATION
							Sediments SEDIMENT	Waters WATER	ALTERNATIVE ANALYSIS	
082	0229_MW138_220824		24/08/2022 02:50 PM	Water	ALS: 4 Non ALS: 0	No		Partial 1/4		Extra vol lab qc
083	0229_MW205S_220824		24/08/2022 03:10 PM	Water	ALS: 2 Non ALS: 0	No		Partial 1/4		Contamination: Previous results
084	0229_QC303_220824		24/08/2022 03:26 PM	Water	ALS: 2 Non ALS: 0	No		Partial 1/4		
085	0229_MW232_220824		24/08/2022 03:38 PM	Water	ALS: 2 Non ALS: 0	No		Partial 1/4		Contamination: Previous results
086	0229_SD211_220825		25/08/2022 04:12 PM	Soil	ALS: 1 Non ALS: 0	No	Partial 1/4			
087	0229_SD212_220825		25/08/2022 07:45 AM	Soil	ALS: 1 Non ALS: 0	No	Partial 1/4			
088	0229_SW211_220825		25/08/2022 04:16 PM	Water	ALS: 2 Non ALS: 0	No		Partial 1/4		
089	0229_SW212_220825		25/08/2022 04:17 PM	Water	ALS: 2 Non ALS: 0	No		Partial 1/4		
090	0229_MW123S_220825		25/08/2022 11:30 AM	Water	ALS: 2 Non ALS: 0	No		Partial 1/4		

**CHAIN OF CUSTODY**

COC#: 41522 ALS Laboratory: ET Townsville

RELINQUISHED BY:
DATE TIME:RECEIVED BY:
DATE TIME:RELINQUISHED BY:
DATE TIME:RECEIVED BY:
DATE TIME: 30/8/22

CLIENT: [REDACTED]

PROJECT: QLD_0229_PFASOMP_20

SITE: QLD_0229

ORDER NO:

PROJECT MANAGER: [REDACTED]
PRIMARY SAMPLER: [REDACTED]CONTACT PH: [REDACTED] SAMPLER MOBILE: [REDACTED]
QUOTE NO: TV/007/21 - Compass / ET2021AECOMAU0001

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	Sediments SEDIMENT	Waters WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
091	0229_MW072_220825		25/08/2022 01:05 AM	Water	ALS: 2 Non ALS: 0	No		Partial 1/4		
092	0229_MW139_220825		25/08/2022 01:47 PM	Water	ALS: 2 Non ALS: 0	No		Partial 1/4		
093	0229_MW065_220825		25/08/2022 10:50 AM	Water	ALS: 2 Non ALS: 0	No		Partial 1/4		
094	0229_MW002_220825		25/08/2022 12:10 PM	Water	ALS: 2 Non ALS: 0	No		Partial 1/4		
095	0229_MW106_220825		25/08/2022 12:15 PM	Water	ALS: 2 Non ALS: 0	No		Partial 1/4		
096	0229_MW074_220825		25/08/2022 01:24 PM	Water	ALS: 2 Non ALS: 0	No		Partial 1/4		
097	0229_MW226_220825		25/08/2022 07:10 AM	Water	ALS: 2 Non ALS: 0	No		Partial 1/4		
098	0229_MW018_220825		25/08/2022 02:15 PM	Water	ALS: 2 Non ALS: 0	No		Partial 1/4		
099	0229_MW235S_220825		25/08/2022 08:50 AM	Water	ALS: 2 Non ALS: 0	No		Partial 1/4		

**CHAIN OF CUSTODY**

ALS COC#: 41522 ALS Laboratory: ET Townsville

RELINQUISHED BY:

RECEIVED BY:

RELINQUISHED BY:

RECEIVED

DATE TIME:

DATE TIME:

DATE TIME:

DATE TIME: 30/8/22

CLIENT:

PROJECT: QLD_0229_PFASOMP_20

SITE: QLD_0229

ORDER NO:

PROJECT MANAGER:

PRIMARY SAMPLER:

EMAIL REPORTS TO:

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:

CONTACT PH:

SAMPLER MOBILE:

QUOTE NO: TV/007/21 - Compass / ET2021AECOMAU000

1

SAMPLE DETAILS**ANALYSIS REQUIRED**

SAMPLE	NAME	DESCRIPTION	DATE / TIME	MATRIX	TOTAL BOTTLES	ON HOLD	ANALYSIS REQUIRED			
							Sediments SEDIMENT	Waters WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
100	0229_MW131_220826		26/08/2022 01:30 PM	Water	ALS: 2 Non ALS: 0	No		Partial 1/4		
101	0229_QC306_220826		26/08/2022 01:40 PM	Water	ALS: 2 Non ALS: 0	No		Partial 1/4		

**CHAIN OF CUSTODY****(ALS) COC#:** 41522 **ALS Laboratory:** ET Townsville**RELINQUISHED BY:****RECEIVED BY:****RELINQUISHED BY:****RECEIVED BY:**

DATE TIME:

DATE TIME:

DATE TIME:

DATE TIME:

CLIENT:

PROJECT: QLD_0229_PFASOMP_20

SITE: QLD_0229

ORDER NO:

PROJECT MANAGER:

PRIMARY SAMPLER:

EMAIL REPORTS TO:

EMAIL INVOICES TO:

TURNAROUND REQUIREMENTS: 5 Days

Biohazard info:

CONTACT PH:

QUOTE NO: TV/007/21 - Compass

SAMPLER MOBILE:

/ ET2021AECOMAU000
1**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:

30/8/22
@ 5:30

SAMPLE	SAMPLE NAME	PARTIAL ANALYSIS GROUP NAME	MATRIX	SELECTED ANALYSIS NAME
001	0229_SD136_220823	Sediments SEDIMENT	Soil	- EP231X (solids) PFAS - Full Suite (28 analytes)
002	0229_SD133_220823	Sediments SEDIMENT	Soil	- EP231X (solids) PFAS - Full Suite (28 analytes)
003	0229_SD128_220823	Sediments SEDIMENT	Soil	- EP231X (solids) PFAS - Full Suite (28 analytes)
004	0229_SD126_220823	Sediments SEDIMENT	Soil	- EP231X (solids) PFAS - Full Suite (28 analytes)
005	0229_QC105_220823	Sediments SEDIMENT	Soil	- EP231X (solids) PFAS - Full Suite (28 analytes)
006	0229_SW233_220823	Waters WATER	Water	- EP231X PFAS - Full Suite (28 analytes)
007	0229_QC104_220823	Waters WATER	Water	- EP231X PFAS - Full Suite (28 analytes)
008	0229_SD245_220823	Sediments SEDIMENT	Soil	- EP231X (solids) PFAS - Full Suite (28 analytes)
009	0229_SW245_220823	Waters WATER	Water	- EP231X PFAS - Full Suite (28 analytes)
010	0229_SD244_220823	Sediments SEDIMENT	Soil	- EP231X (solids) PFAS - Full Suite (28 analytes)
011	0229_SW244_220823	Waters WATER	Water	- EP231X PFAS - Full Suite (28 analytes)
012	0229_SD227_220823	Sediments SEDIMENT	Soil	- EP231X (solids) PFAS - Full Suite (28 analytes)
013	0229_SW227_220823	Waters WATER	Water	- EP231X PFAS - Full Suite (28 analytes)
014	0229_SW109_220822	Waters WATER	Water	- EP231X PFAS - Full Suite (28 analytes)
015	0229_SD109_220822	Sediments SEDIMENT	Soil	- EP231X (solids) PFAS - Full Suite (28 analytes)

**CHAIN OF CUSTODY**

COC#: 41522 ALS Laboratory: ET Townsville

RELINQUISHED BY:
DATE TIME:RECEIVED BY:
DATE TIME:RELINQUISHED BY:
DATE TIME:REC: [Redacted]
DATE TIME: 30/8/22CLIENT: [Redacted]
PROJECT: QLD_0229_PFASOMP_20
SITE: QLD_0229
ORDER NO:
PROJECT MANAGER: [Redacted]
PRIMARY SAMPLER: [Redacted]
EMAIL REPORTS TO: [Redacted]
EMAIL INVOICES TO: [Redacted]TURNAROUND REQUIREMENTS : 5 Days
Biohazard info:CONTACT PH: SAMPLER MOBILE:
QUOTE NO: TV/007/21 - Compass / ET2021AECOMAU000
1**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	0229_SW110_220822	Waters WATER	Water	- EP231X PFAS - Full Suite (28 analytes)
017	0229_SD110_220822	Sediments SEDIMENT	Soil	- EP231X (solids) PFAS - Full Suite (28 analytes)
018	0229_SW113_220822	Waters WATER	Water	- EP231X PFAS - Full Suite (28 analytes)
019	0229_SW110_220822	Sediments SEDIMENT	Soil	- EP231X (solids) PFAS - Full Suite (28 analytes)
020	0229_SD119_220822	Sediments SEDIMENT	Soil	- EP231X (solids) PFAS - Full Suite (28 analytes)
021	0229_SW121_220822	Waters WATER	Water	- EP231X PFAS - Full Suite (28 analytes)
022	0229_SD129_220822	Sediments SEDIMENT	Soil	- EP231X (solids) PFAS - Full Suite (28 analytes)
023	0229_SD130_220822	Sediments SEDIMENT	Soil	- EP231X (solids) PFAS - Full Suite (28 analytes)
024	0229_SW132_220822	Sediments SEDIMENT	Soil	- EP231X (solids) PFAS - Full Suite (28 analytes)
025	0229_SW134_220822	Sediments SEDIMENT	Soil	- EP231X (solids) PFAS - Full Suite (28 analytes)
026	0229_SW135_220822	Waters WATER	Water	- EP231X PFAS - Full Suite (28 analytes)
027	0229_SD139_220822	Sediments SEDIMENT	Soil	- EP231X (solids) PFAS - Full Suite (28 analytes)
028	0229_SW139_220822	Waters WATER	Water	- EP231X PFAS - Full Suite (28 analytes)
029	0229_SD144_220822	Sediments SEDIMENT	Soil	- EP231X (solids) PFAS - Full Suite (28 analytes)
030	0229_SW140_220822	Waters WATER	Water	- EP231X PFAS - Full Suite (28 analytes)
031	0229_SW217_220822	Waters WATER	Water	- EP231X PFAS - Full Suite (28 analytes)

**CHAIN OF CUSTODY**

COC#: 41522 ALS Laboratory: ET Townsville

RELINQUISHED BY:

RECEIVED BY:

RELINQUISHED BY:

RECEIVED BY:

DATE TIME:

DATE TIME:

DATE TIME:

DATE TIME:

CLIENT:

PROJECT: QLD_0229_PFASOMP_20

SITE: QLD_0229

ORDER NO:

PROJECT MANAGER:

PRIMARY SAMPLER:

EMAIL REPORTS TO:

EMAIL INVOICES TO:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

CONTACT PH:

QUOTE NO: TV/007/21 - Compass

SAMPLER MOBILE:

/ ET2021AECOMAU000

1

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:

30/8/22
@ 8:30

032	0229_SW205_220822	Waters WATER	Water	- EP231X PFAS - Full Suite (28 analytes)
033	0229_SD205_220822	Sediments SEDIMENT	Soil	- EP231X (solids) PFAS - Full Suite (28 analytes)
034	0229_SD217_220822	Sediments SEDIMENT	Soil	- EP231X (solids) PFAS - Full Suite (28 analytes)
035	0229_SD203_220822	Sediments SEDIMENT	Soil	- EP231X (solids) PFAS - Full Suite (28 analytes)
036	0229_SD220_220822	Sediments SEDIMENT	Soil	- EP231X (solids) PFAS - Full Suite (28 analytes)
037	0229_QC100_220822	Sediments SEDIMENT	Soil	- EP231X (solids) PFAS - Full Suite (28 analytes)
038	0229_QC102_220822	Sediments SEDIMENT	Soil	- EP231X (solids) PFAS - Full Suite (28 analytes)
039	0229_QC103_220822	Sediments SEDIMENT	Soil	- EP231X (solids) PFAS - Full Suite (28 analytes)
040	0229_QC301_220822	Waters WATER	Water	- EP231X PFAS - Full Suite (28 analytes)
041	0229_QC500_220822	Waters WATER	Water	- EP231X PFAS - Full Suite (28 analytes)
042	0229_QC101_220822	Waters WATER	Water	- EP231X PFAS - Full Suite (28 analytes)
043	0229_QC300_220822	Waters WATER	Water	- EP231X PFAS - Full Suite (28 analytes)
044	0229_SW243_220822	Waters WATER	Water	- EP231X PFAS - Full Suite (28 analytes)
045	0229_SD243_220822	Sediments SEDIMENT	Soil	- EP231X (solids) PFAS - Full Suite (28 analytes)
046	0229_SW242_220822	Waters WATER	Water	- EP231X PFAS - Full Suite (28 analytes)
047	0229_SD242_220822	Sediments SEDIMENT	Soil	- EP231X (solids) PFAS - Full Suite (28 analytes)

**CHAIN OF CUSTODY**

COC#: 41522

ALS Laboratory: ET Townsville

RELINQUISHED BY:

RECEIVED BY:

RELINQUISHED BY:

RECEIVED BY:

DATE TIME:

DATE TIME:

DATE TIME:

DATE TIME:

CLIENT:

PROJECT: QLD_0229_PFSOMP_20

SITE: QLD_0229

ORDER NO:

PROJECT MANAGER:

PRIMARY SAMPLER:

EMAIL REPORTS TO:

EMAIL INVOICES TO:

TURNAROUND REQUIREMENTS: 5 Days

Biohazard info:

CONTACT PH:

QUOTE NO: TV/007/21 - Compass

SAMPLER MOBILE:

/ ET2021AECOMAU000
1**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:

30/8/22
@ 8:30

048	0229_SD233_220822	Sediments SEDIMENT	Soil	- EP231X (solids) PFAS - Full Suite (28 analytes)
049	0229_SD232_220822	Sediments SEDIMENT	Soil	- EP231X (solids) PFAS - Full Suite (28 analytes)
050	0229_SW232_220822	Waters WATER	Water	- EP231X PFAS - Full Suite (28 analytes)
051	0229_SW220_220822	Waters WATER	Water	- EP231X PFAS - Full Suite (28 analytes)
052	0229_SW203_220822	Waters WATER	Water	- EP231X PFAS - Full Suite (28 analytes)
053	0229_QC302_220823	Waters WATER	Water	- EP231X PFAS - Full Suite (28 analytes)
054	0229_MW125S_220824	Waters WATER	Water	- EP231X PFAS - Full Suite (28 analytes)
055	0229_MW125I_220824	Waters WATER	Water	- EP231X PFAS - Full Suite (28 analytes)
056	0229_MW124_220824	Waters WATER	Water	- EP231X PFAS - Full Suite (28 analytes)
057	0229_MW123I_220824	Waters WATER	Water	- EP231X PFAS - Full Suite (28 analytes)
058	0229_MW105_220824	Waters WATER	Water	- EP231X PFAS - Full Suite (28 analytes)
059	0229_MW217_220824	Waters WATER	Water	- EP231X PFAS - Full Suite (28 analytes)
060	0229_MW212_220824	Waters WATER	Water	- EP231X PFAS - Full Suite (28 analytes)
061	0229_QC106_220824	Waters WATER	Water	- EP231X PFAS - Full Suite (28 analytes)
062	0229_MW128_220824	Waters WATER	Water	- EP231X PFAS - Full Suite (28 analytes)
063	0229_QC107_220824	Waters WATER	Water	- EP231X PFAS - Full Suite (28 analytes)

**CHAIN OF CUSTODY**

COC#: 41522

ALS Laboratory: ET Townsville

RELINQUISHED BY:

RECEIVED BY:

RELINQUISHED BY:

RECEIVED BY: [REDACTED]

DATE TIME:

DATE TIME:

DATE TIME:

DATE TIME: 30/8/22 @ 8:30

CLIENT: [REDACTED]

PROJECT: QLD_0229_PASOMP_20

SITE: QLD_0229

ORDER NO:

PROJECT MANAGER: [REDACTED]

PRIMARY SAMPLER: [REDACTED]

EMAIL REPORTS TO: [REDACTED]

EMAIL INVOICES TO: [REDACTED]

TURNAROUND REQUIREMENTS: 5 Days

Biohazard info:

CONTACT PH:

SAMPLER MOBILE:

QUOTE NO: TV/007/21 - Compass

/ ET2021AECOMAU000

1

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:

064	0229_MW102_220824	Waters WATER	Water	- EP231X PFAS - Full Suite (28 analytes)
065	0229_MW233_220824	Waters WATER	Water	- EP231X PFAS - Full Suite (28 analytes)
066	0229_QC108_220824	Waters WATER	Water	- EP231X PFAS - Full Suite (28 analytes)
067	0229_MW003_220824	Waters WATER	Water	- EP231X PFAS - Full Suite (28 analytes)
068	0229_MW220S_220824	Waters WATER	Water	- EP231X PFAS - Full Suite (28 analytes)
069	0229_MW122_220824	Waters WATER	Water	- EP231X PFAS - Full Suite (28 analytes)
070	0229_MW121_220824	Waters WATER	Water	- EP231X PFAS - Full Suite (28 analytes)
071	0229_MW101_220824	Waters WATER	Water	- EP231X PFAS - Full Suite (28 analytes)
072	0229_MW141_220824	Waters WATER	Water	- EP231X PFAS - Full Suite (28 analytes)
073	0229_MW116_220824	Waters WATER	Water	- EP231X PFAS - Full Suite (28 analytes)
074	0229_MW115_220824	Waters WATER	Water	- EP231X PFAS - Full Suite (28 analytes)
075	0229_QC109_220824	Waters WATER	Water	- EP231X PFAS - Full Suite (28 analytes)
076	0229_MW118_220824	Waters WATER	Water	- EP231X PFAS - Full Suite (28 analytes)
077	0229_MW119_220824	Waters WATER	Water	- EP231X PFAS - Full Suite (28 analytes)
078	0229_MW135_220824	Waters WATER	Water	- EP231X PFAS - Full Suite (28 analytes)
079	0229_MW114_220824	Waters WATER	Water	- EP231X PFAS - Full Suite (28 analytes)

**CHAIN OF CUSTODY**

COC#: 41522 ALS Laboratory: ET Townsville

RELINQUISHED BY:

RECEIVED BY:

RELINQUISHED BY:

RECEIVED BY:

DATE TIME:

DATE TIME:

DATE TIME:

DATE TIME:

CLIENT:

PROJECT: QLD_0229_PFASOMP_20

SITE: QLD_0229

ORDER NO:

PROJECT MANAGER:

PRIMARY SAMPLER:

EMAIL REPORTS TO:

EMAIL INVOICES TO:

TURNAROUND REQUIREMENTS: 5 Days

Biohazard info:

CONTACT PH:

QUOTE NO: TV/007/21 - Compass

SAMPLER MOBILE:

/ ET2021AECOMAU000
1**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:

30/8/22
@ 8:30

080	0229_MW120_220824	Waters WATER	Water	- EP231X PFAS - Full Suite (28 analytes)
081	0229_MW236S_220824	Waters WATER	Water	- EP231X PFAS - Full Suite (28 analytes)
082	0229_MW138_220824	Waters WATER	Water	- EP231X PFAS - Full Suite (28 analytes)
083	0229_MW205S_220824	Waters WATER	Water	- EP231X PFAS - Full Suite (28 analytes)
084	0229_QC303_220824	Waters WATER	Water	- EP231X PFAS - Full Suite (28 analytes)
085	0229_MW232_220824	Waters WATER	Water	- EP231X PFAS - Full Suite (28 analytes)
086	0229_SD211_220825	Sediments SEDIMENT	Soil	- EP231X (solids) PFAS - Full Suite (28 analytes)
087	0229_SD212_220825	Sediments SEDIMENT	Soil	- EP231X (solids) PFAS - Full Suite (28 analytes)
088	0229_SW211_220825	Waters WATER	Water	- EP231X PFAS - Full Suite (28 analytes)
089	0229_SW212_220825	Waters WATER	Water	- EP231X PFAS - Full Suite (28 analytes)
090	0229_MW123S_220825	Waters WATER	Water	- EP231X PFAS - Full Suite (28 analytes)
091	0229_MW072_220825	Waters WATER	Water	- EP231X PFAS - Full Suite (28 analytes)
092	0229_MW139_220825	Waters WATER	Water	- EP231X PFAS - Full Suite (28 analytes)
093	0229_MW065_220825	Waters WATER	Water	- EP231X PFAS - Full Suite (28 analytes)
094	0229_MW002_220825	Waters WATER	Water	- EP231X PFAS - Full Suite (28 analytes)
095	0229_MW106_220825	Waters WATER	Water	- EP231X PFAS - Full Suite (28 analytes)

CHAIN OF CUSTODY
 (ALS) COC#: 41522 ALS Laboratory: ET Townsville

RELINQUISHED BY:
 DATE TIME:

RECEIVED BY:
 DATE TIME:

RELINQUISHED BY:
 DATE TIME:

RECEIVED BY: [Redacted]
 DATE TIME: 30/8/22
 @ 8:30

CLIENT: [Redacted]
 PROJECT: QLD_0229_PFASOMP_20
 SITE: QLD_0229
 ORDER NO:
 PROJECT MANAGER: [Redacted]
 PRIMARY SAMPLER: [Redacted]
 EMAIL REPORTS TO: [Redacted]
 EMAIL INVOICES TO: [Redacted]

TURNAROUND REQUIREMENTS : 5 Days
 Biohazard info:

CONTACT PH: SAMPLER MOBILE:
 QUOTE NO: TV/007/21 - Compass / ET2021AECOMAU000
 1

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:

096	0229_MW074_220825	Waters WATER	Water	- EP231X PFAS - Full Suite (28 analytes)
097	0229_MW226_220825	Waters WATER	Water	- EP231X PFAS - Full Suite (28 analytes)
098	0229_MW018_220825	Waters WATER	Water	- EP231X PFAS - Full Suite (28 analytes)
099	0229_MW235S_220825	Waters WATER	Water	- EP231X PFAS - Full Suite (28 analytes)
100	0229_MW131_220826	Waters WATER	Water	- EP231X PFAS - Full Suite (28 analytes)
101	0229_QC306_220826	Waters WATER	Water	- EP231X PFAS - Full Suite (28 analytes)

**CHAIN OF CUSTODY**

ALS COC#: 41522 ALS Laboratory: ET Townsville

RELINQUISHED BY:

RECEIVED BY:

RELINQUISHED BY:

RECEIVED BY:

DATE TIME:

DATE TIME:

DATE TIME:

DATE TIME:

CLIENT:

PROJECT: QLD_0229_PFSOMP_20

SITE: QLD_0229

ORDER NO:

PROJECT MANAGER:

PRIMARY SAMPLER:

EMAIL REPORTS TO:

EMAIL INVOICES TO:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

CONTACT PH:

SAMPLER MOBILE:

QUOTE NO: TV/007/21 - Compass

/ ET2021AECOMAU000

1

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:

30/8/22
@ 4:30

SAMPLE	SAMPLE NAME	BOTTLE NAME	VOLUME	BARCODE	TYPE	FILTERED	REASON
001	0229_SD136_220823	HDPE Soil Jar	200 mL	00621019076436	Grey	No	
002	0229_SD133_220823	HDPE Soil Jar	200 mL	00620719043980	Grey	No	
003	0229_SD128_220823	HDPE Soil Jar	200 mL	00621019064189	Grey	No	
004	0229_SD126_220823	HDPE Soil Jar	200 mL	00621019076433	Grey	No	
005	0229_QC105_220823	HDPE Soil Jar	200 mL	00621019076439	Grey	No	
006	0229_SW233_220823	HDPE (no PTFE)	20 mL	00350621051006	Grey	No	
006	0229_SW233_220823	HDPE (no PTFE)	20 mL	00350621050897	Grey	No	
007	0229_QC104_220823	HDPE (no PTFE)	20 mL	00350821027599	Grey	No	
007	0229_QC104_220823	HDPE (no PTFE)	20 mL	00350821027630	Grey	No	
008	0229_SD245_220823	HDPE Soil Jar	200 mL	00621019064172	Grey	No	
009	0229_SW245_220823	HDPE (no PTFE)	20 mL	00350019045266	Grey	No	
009	0229_SW245_220823	HDPE (no PTFE)	20 mL	00350019024949	Grey	No	
010	0229_SD244_220823	HDPE Soil Jar	200 mL	00621019076477	Grey	No	
011	0229_SW244_220823	HDPE (no PTFE)	20 mL	00350019024844	Grey	No	
011	0229_SW244_220823	HDPE (no PTFE)	20 mL	00350019045176	Grey	No	
012	0229_SD227_220823	HDPE Soil Jar	200 mL	00621019064166	Grey	No	
013	0229_SW227_220823	HDPE (no PTFE)	20 mL	00350019045190	Grey	No	
013	0229_SW227_220823	HDPE (no PTFE)	20 mL	00350019024945	Grey	No	
014	0229_SW109_220822	HDPE (no PTFE)	20 mL	00350821027597	Grey	No	
014	0229_SW109_220822	HDPE (no PTFE)	20 mL	00350821027653	Grey	No	
015	0229_SD109_220822	HDPE Soil Jar	200 mL	00621019059254	Grey	No	
016	0229_SW110_220822	HDPE (no PTFE)	20 mL	00350019045279	Grey	No	
016	0229_SW110_220822	HDPE (no PTFE)	20 mL	00350019024976	Grey	No	
017	0229_SD110_220822	HDPE Soil Jar	200 mL	00620719043953	Grey	No	
018	0229_SW113_220822	HDPE (no PTFE)	20 mL	00350821027793	Grey	No	
018	0229_SW113_220822	HDPE (no PTFE)	20 mL	00350821027822	Grey	No	

**CHAIN OF CUSTODY**

COC#: 41522

ALS Laboratory: ET Townsville

RELINQUISHED BY:

RECEIVED BY:

RELINQUISHED BY:

RECEIVED BY:

DATE TIME:

DATE TIME:

DATE TIME:

DATE TIME: 30/8/22
@ 5:30

CLIENT:

PROJECT: QLD_0229_PASOMP_20

SITE: QLD_0229

ORDER NO:

PROJECT MANAGER:

PRIMARY SAMPLER:

EMAIL REPORTS TO:

EMAIL INVOICES TO:

TURNAROUND REQUIREMENTS: 5 Days

Biohazard info:

CONTACT PH:

QUOTE NO: TV/007/21 - Compass

SAMPLER MOBILE:

/ ET2021AECOMAU000

1

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:

019	0229_SW110_220822	HDPE Soil Jar	200 mL	00620719026219	Grey	No	
020	0229_SD119_220822	HDPE Soil Jar	200 mL	00620719026184	Grey	No	
021	0229_SW121_220822	HDPE (no PTFE)	20 mL	00352101052862	Grey	No	
021	0229_SW121_220822	HDPE (no PTFE)	20 mL	00352101033414	Grey	No	
022	0229_SD129_220822	HDPE Soil Jar	200 mL	00621019064173	Grey	No	
023	0229_SD130_220822	HDPE Soil Jar	200 mL	00620719043896	Grey	No	
024	0229_SW132_220822	HDPE Soil Jar	200 mL	00621019064237	Grey	No	
025	0229_SW134_220822	HDPE Soil Jar	200 mL	00621019064227	Grey	No	
026	0229_SW135_220822	HDPE (no PTFE)	20 mL	00350019045293	Grey	No	
026	0229_SW135_220822	HDPE (no PTFE)	20 mL	00352101052829	Grey	No	
027	0229_SD139_220822	HDPE Soil Jar	200 mL	00620719026260	Grey	No	
028	0229_SW139_220822	HDPE (no PTFE)	20 mL	00350019045228	Grey	No	
028	0229_SW139_220822	HDPE (no PTFE)	20 mL	00350019045175	Grey	No	
029	0229_SD144_220822	HDPE Soil Jar	200 mL	00620719026213	Grey	No	
030	0229_SW140_220822	HDPE (no PTFE)	20 mL	00350019024881	Grey	No	
030	0229_SW140_220822	HDPE (no PTFE)	20 mL	00350019045193	Grey	No	
031	0229_SW217_220822	HDPE (no PTFE)	20 mL	00350821027421	Grey	No	
031	0229_SW217_220822	HDPE (no PTFE)	20 mL	00350821027367	Grey	No	
032	0229_SW205_220822	HDPE (no PTFE)	20 mL	00350821027603	Grey	No	
032	0229_SW205_220822	HDPE (no PTFE)	20 mL	00350821027639	Grey	No	
033	0229_SD205_220822	HDPE Soil Jar	200 mL	00620719043947	Grey	No	
034	0229_SD217_220822	HDPE Soil Jar	200 mL	00621019064193	Grey	No	
035	0229_SD203_220822	HDPE Soil Jar	200 mL	00621019064182	Grey	No	
036	0229_SD220_220822	HDPE Soil Jar	200 mL	00620719043900	Grey	No	
037	0229_QC100_220822	HDPE Soil Jar	200 mL	00620719026311	Grey	No	
038	0229_QC102_220822	HDPE Soil Jar	200 mL	00621019076348	Grey	No	
039	0229_QC103_220822	HDPE Soil Jar	200 mL	00621019064275	Grey	No	

**CHAIN OF CUSTODY**

COC#: 41522

ALS Laboratory: ET Townsville

RELINQUISHED BY:

RECEIVED BY:

RELINQUISHED BY:

RECEIVED BY:

DATE TIME:

DATE TIME:

DATE TIME:

DATE TIME:

50/6/22
@ 6:30

CLIENT:

PROJECT: QLD_0229_PFSOMP_20

SITE: QLD_0229

ORDER NO:

PROJECT MANAGER:

PRIMARY SAMPLER:

EMAIL REPORTS TO:

EMAIL INVOICES TO:

TURNAROUND REQUIREMENTS: 5 Days

Biohazard info:

CONTACT PH:

QUOTE NO: TV/007/21 - Compass

SAMPLER MOBILE:

/ ET2021AECOMAU000
1**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:

040	0229_QC301_220822	HDPE (no PTFE)	20 mL	00350019024878	Grey	No	
040	0229_QC301_220822	HDPE (no PTFE)	20 mL	00350019045192	Grey	No	
041	0229_QC500_220822	HDPE (no PTFE)	20 mL	00350621064561	Grey	No	
041	0229_QC500_220822	HDPE (no PTFE)	20 mL	00350621064634	Grey	No	
042	0229_QC101_220822	HDPE (no PTFE)	20 mL	00350821027574	Grey	No	
042	0229_QC101_220822	HDPE (no PTFE)	20 mL	00350821027903	Grey	No	
043	0229_QC300_220822	HDPE (no PTFE)	20 mL	00350821027755	Grey	No	
043	0229_QC300_220822	HDPE (no PTFE)	20 mL	00350821027812	Grey	No	
044	0229_SW243_220822	HDPE (no PTFE)	20 mL	00350821027460	Grey	No	
044	0229_SW243_220822	HDPE (no PTFE)	20 mL	00350821027702	Grey	No	
044	0229_SW243_220822	HDPE (no PTFE)	20 mL	00350821027415	Grey	No	
044	0229_SW243_220822	HDPE (no PTFE)	20 mL	00350821027183	Grey	No	
045	0229_SD243_220822	HDPE Soil Jar	200 mL	00621019064212	Grey	No	
046	0229_SW242_220822	HDPE (no PTFE)	20 mL	00350821027717	Grey	No	
046	0229_SW242_220822	HDPE (no PTFE)	20 mL	00350821027503	Grey	No	
047	0229_SD242_220822	HDPE Soil Jar	200 mL	00621019064174	Grey	No	
048	0229_SD233_220822	HDPE Soil Jar	200 mL	00620719043948	Grey	No	
049	0229_SD232_220822	HDPE Soil Jar	200 mL	00621019076448	Grey	No	
050	0229_SW232_220822	HDPE (no PTFE)	20 mL	00350821027544	Grey	No	
050	0229_SW232_220822	HDPE (no PTFE)	20 mL	00350821027571	Grey	No	
050	0229_SW232_220822	HDPE (no PTFE)	20 mL	00350821027579	Grey	No	
050	0229_SW232_220822	HDPE (no PTFE)	20 mL	00350821027786	Grey	No	
051	0229_SW220_220822	HDPE (no PTFE)	20 mL	00350821027683	Grey	No	
051	0229_SW220_220822	HDPE (no PTFE)	20 mL	00350821027563	Grey	No	
051	0229_SW220_220822	HDPE (no PTFE)	20 mL	00350821027322	Grey	No	
051	0229_SW220_220822	HDPE (no PTFE)	20 mL	00350821027508	Grey	No	
052	0229_SW203_220822	HDPE (no PTFE)	20 mL	00350821027439	Grey	No	

CHAIN OF CUSTODY
 (ALS) COC#: 41522 ALS Laboratory: ET Townsville

RELINQUISHED BY:
 DATE TIME:

RECEIVED BY:
 DATE TIME:

RELINQUISHED BY:
 DATE TIME:

RECEIVED BY: [Redacted]
 DATE TIME: 30/8/22 @ 8:30

CLIENT: [Redacted]
 PROJECT: QLD_0229_PFSOMP_20
 SITE: QLD_0229
 ORDER NO:
 PROJECT MANAGER: [Redacted]
 PRIMARY SAMPLER: [Redacted]
 EMAIL REPORTS TO: [Redacted]
 EMAIL INVOICES TO: [Redacted]

TURNAROUND REQUIREMENTS : 5 Days
 Biohazard info:

CONTACT PH: SAMPLER MOBILE:
 QUOTE NO: TV/007/21 - Compass / ET2021AECOMAU000
 1

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:

052	0229_SW203_220822	HDPE (no PTFE)	20 mL	00350821027677	Grey	No	
052	0229_SW203_220822	HDPE (no PTFE)	20 mL	00350821027532	Grey	No	
052	0229_SW203_220822	HDPE (no PTFE)	20 mL	00350821027859	Grey	No	
053	0229_QC302_220823	HDPE (no PTFE)	20 mL	00352010065701	Grey	No	
053	0229_QC302_220823	HDPE (no PTFE)	20 mL	00352010065683	Grey	No	
054	0229_MW125S_220824	HDPE (no PTFE)	20 mL	00352101033444	Grey	No	
054	0229_MW125S_220824	HDPE (no PTFE)	20 mL	00350821027760	Grey	No	
054	0229_MW125S_220824	HDPE (no PTFE)	20 mL	00352101052841	Grey	No	
054	0229_MW125S_220824	HDPE (no PTFE)	20 mL	00350821027815	Grey	No	
055	0229_MW125I_220824	HDPE (no PTFE)	20 mL	00350019024970	Grey	No	
055	0229_MW125I_220824	HDPE (no PTFE)	20 mL	00350019024952	Grey	No	
056	0229_MW124_220824	HDPE (no PTFE)	20 mL	00350019045163	Grey	No	
056	0229_MW124_220824	HDPE (no PTFE)	20 mL	00350019024966	Grey	No	
057	0229_MW123I_220824	HDPE (no PTFE)	20 mL	00352101052887	Grey	No	
057	0229_MW123I_220824	HDPE (no PTFE)	20 mL	00350019045283	Grey	No	
057	0229_MW123I_220824	HDPE (no PTFE)	20 mL	00350019045203	Grey	No	
057	0229_MW123I_220824	HDPE (no PTFE)	20 mL	00352101052849	Grey	No	
058	0229_MW105_220824	HDPE (no PTFE)	20 mL	00352101033437	Grey	No	
058	0229_MW105_220824	HDPE (no PTFE)	20 mL	00352101033494	Grey	No	
058	0229_MW105_220824	HDPE (no PTFE)	20 mL	00350019024906	Grey	No	
058	0229_MW105_220824	HDPE (no PTFE)	20 mL	00350019024918	Grey	No	
059	0229_MW217_220824	HDPE (no PTFE)	20 mL	00352010065505	Grey	No	
059	0229_MW217_220824	HDPE (no PTFE)	20 mL	00352010065629	Grey	No	
060	0229_MW212_220824	HDPE (no PTFE)	20 mL	00350621050975	Grey	No	
060	0229_MW212_220824	HDPE (no PTFE)	20 mL	00350621050938	Grey	No	
061	0229_QC106_220824	HDPE (no PTFE)	20 mL	00352010057944	Grey	No	
061	0229_QC106_220824	HDPE (no PTFE)	20 mL	00352010059828	Grey	No	

**CHAIN OF CUSTODY**

COC#: 41522 ALS Laboratory: ET Townsville

RELINQUISHED BY:

RECEIVED BY:

RELINQUISHED BY:

RECEIVED BY:

DATE TIME:

DATE TIME:

DATE TIME:

DATE TIME:

CLIENT:

PROJECT: QLD_0229_PFSOMP_20

SITE: QLD_0229

ORDER NO:

PROJECT MANAGER:

PRIMARY SAMPLER:

EMAIL REPORTS TO:

EMAIL INVOICES TO:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

CONTACT PH:

QUOTE NO: TV/007/21 - Compass

SAMPLER MOBILE:

/ ET2021AECOMAU000

1

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:

8/18/22
@8:20

062	0229_MW128_220824	HDPE (no PTFE)	20 mL	00350821027843	Grey	No	
062	0229_MW128_220824	HDPE (no PTFE)	20 mL	00350821027758	Grey	No	
063	0229_QC107_220824	HDPE (no PTFE)	20 mL	00350019024968	Grey	No	
063	0229_QC107_220824	HDPE (no PTFE)	20 mL	00350019024897	Grey	No	
064	0229_MW102_220824	HDPE (no PTFE)	20 mL	00350821027578	Grey	No	
064	0229_MW102_220824	HDPE (no PTFE)	20 mL	00350821027893	Grey	No	
065	0229_MW233_220824	HDPE (no PTFE)	20 mL	00350019152584	Grey	No	
065	0229_MW233_220824	HDPE (no PTFE)	20 mL	00350019152644	Grey	No	
066	0229_QC108_220824	HDPE (no PTFE)	20 mL	00350019024907	Grey	No	
066	0229_QC108_220824	HDPE (no PTFE)	20 mL	00350019024926	Grey	No	
067	0229_MW003_220824	HDPE (no PTFE)	20 mL	00350019024920	Grey	No	
067	0229_MW003_220824	HDPE (no PTFE)	20 mL	00350019045256	Grey	No	
068	0229_MW220S_220824	HDPE (no PTFE)	20 mL	00350821027608	Grey	No	
068	0229_MW220S_220824	HDPE (no PTFE)	20 mL	00350821027487	Grey	No	
069	0229_MW122_220824	HDPE (no PTFE)	20 mL	00352010065419	Grey	No	
069	0229_MW122_220824	HDPE (no PTFE)	20 mL	00352010065485	Grey	No	
069	0229_MW122_220824	HDPE (no PTFE)	20 mL	00350621030124	Grey	No	
069	0229_MW122_220824	HDPE (no PTFE)	20 mL	00350621030227	Grey	No	
070	0229_MW121_220824	HDPE (no PTFE)	20 mL	00350019045212	Grey	No	
070	0229_MW121_220824	HDPE (no PTFE)	20 mL	00350019045275	Grey	No	
071	0229_MW101_220824	HDPE (no PTFE)	20 mL	00350019045318	Grey	No	
071	0229_MW101_220824	HDPE (no PTFE)	20 mL	00350019045209	Grey	No	
072	0229_MW141_220824	HDPE (no PTFE)	20 mL	00352101033477	Grey	No	
072	0229_MW141_220824	HDPE (no PTFE)	20 mL	00352101033472	Grey	No	
073	0229_MW116_220824	HDPE (no PTFE)	20 mL	00350821027468	Grey	No	
073	0229_MW116_220824	HDPE (no PTFE)	20 mL	00350821027427	Grey	No	
074	0229_MW115_220824	HDPE (no PTFE)	20 mL	00350821027829	Grey	No	

**CHAIN OF CUSTODY**

COC#: 41522

ALS Laboratory: ET Townsville

RELINQUISHED BY:

RECEIVED BY:

RELINQUISHED BY:

RECEIVED BY:

DATE TIME:

DATE TIME:

DATE TIME:

DATE TIME:

CLIENT:

PROJECT: QLD_0229_PFSOMP_20

SITE: QLD_0229

ORDER NO:

PROJECT MANAGER:

PRIMARY SAMPLER:

EMAIL REPORTS TO:

EMAIL INVOICES TO:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

CONTACT PH:

QUOTE NO: TV/007/21 - Compass

SAMPLER MOBILE:

/ ET2021AECOMAU000

1

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:

30/8/22

@ 8:30

074	0229_MW115_220824	HDPE (no PTFE)	20 mL	00350821027904	Grey	No	
074	0229_MW115_220824	HDPE (no PTFE)	20 mL	00350821027806	Grey	No	
074	0229_MW115_220824	HDPE (no PTFE)	20 mL	00350821027386	Grey	No	
075	0229_QC109_220824	HDPE (no PTFE)	20 mL	00350019045285	Grey	No	
075	0229_QC109_220824	HDPE (no PTFE)	20 mL	00350019024954	Grey	No	
076	0229_MW118_220824	HDPE (no PTFE)	20 mL	00352010065538	Grey	No	
076	0229_MW118_220824	HDPE (no PTFE)	20 mL	00352010065662	Grey	No	
076	0229_MW118_220824	HDPE (no PTFE)	20 mL	00350821027572	Grey	No	
076	0229_MW118_220824	HDPE (no PTFE)	20 mL	00350821027324	Grey	No	
077	0229_MW119_220824	HDPE (no PTFE)	20 mL	00350019045221	Grey	No	
077	0229_MW119_220824	HDPE (no PTFE)	20 mL	00350019045290	Grey	No	
078	0229_MW135_220824	HDPE (no PTFE)	20 mL	00350621050826	Grey	No	
078	0229_MW135_220824	HDPE (no PTFE)	20 mL	00350621050972	Grey	No	
079	0229_MW114_220824	HDPE (no PTFE)	20 mL	00352101033596	Grey	No	
079	0229_MW114_220824	HDPE (no PTFE)	20 mL	00352101033530	Grey	No	
080	0229_MW120_220824	HDPE (no PTFE)	20 mL	00350821027373	Grey	No	
080	0229_MW120_220824	HDPE (no PTFE)	20 mL	00350821027414	Grey	No	
081	0229_MW236S_220824	HDPE (no PTFE)	20 mL	00350821027320	Grey	No	
081	0229_MW236S_220824	HDPE (no PTFE)	20 mL	00350821027737	Grey	No	
082	0229_MW138_220824	HDPE (no PTFE)	20 mL	00350821027341	Grey	No	
082	0229_MW138_220824	HDPE (no PTFE)	20 mL	00350621051055	Grey	No	
082	0229_MW138_220824	HDPE (no PTFE)	20 mL	00350821027419	Grey	No	
082	0229_MW138_220824	HDPE (no PTFE)	20 mL	00350621051019	Grey	No	
083	0229_MW205S_220824	HDPE (no PTFE)	20 mL	00352101052816	Grey	No	
083	0229_MW205S_220824	HDPE (no PTFE)	20 mL	00352101052860	Grey	No	
084	0229_QC303_220824	HDPE (no PTFE)	20 mL	00350821027552	Grey	No	
084	0229_QC303_220824	HDPE (no PTFE)	20 mL	00350821027823	Grey	No	

**CHAIN OF CUSTODY**

COC#: 41522

ALS Laboratory: ET Townsville

RELINQUISHED BY:

DATE TIME:
RECEIVED BY:

DATE TIME:
RELINQUISHED BY:

DATE TIME:
RECEIVED
DATE TIME: 28/6/22
 08:30

CLIENT:
PROJECT: QLD_0229_PFSOMP_20
SITE: QLD_0229
ORDER NO:
PROJECT MANAGER:
PRIMARY SAMPLER:
EMAIL REPORTS TO:
EMAIL INVOICES TO:
TURNAROUND REQUIREMENTS : 5 Days
Biohazard info:
CONTACT PH: **SAMPLER MOBILE:**
QUOTE NO: TV/007/21 - Compass / ET2021AECOMAU000
 1

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:

ID	Sample ID	Material	Volume	Barcode	Color	Seal	Temp
085	0229_MW232_220824	HDPE (no PTFE)	20 mL	00350821027481	Grey	No	
085	0229_MW232_220824	HDPE (no PTFE)	20 mL	00350821027682	Grey	No	
086	0229_SD211_220825	HDPE Soil Jar	200 mL	00620719043982	Grey	No	
087	0229_SD212_220825	HDPE Soil Jar	200 mL	00621019064163	Grey	No	
088	0229_SW211_220825	HDPE (no PTFE)	20 mL	00350621051071	Grey	No	
088	0229_SW211_220825	HDPE (no PTFE)	20 mL	00350621051001	Grey	No	
089	0229_SW212_220825	HDPE (no PTFE)	20 mL	00352010065637	Grey	No	
089	0229_SW212_220825	HDPE (no PTFE)	20 mL	00352010065466	Grey	No	
090	0229_MW123S_220825	HDPE (no PTFE)	20 mL	00352010065434	Grey	No	
090	0229_MW123S_220825	HDPE (no PTFE)	20 mL	00352010065461	Grey	No	
091	0229_MW072_220825	HDPE (no PTFE)	20 mL	00350019024917	Grey	No	
091	0229_MW072_220825	HDPE (no PTFE)	20 mL	00350019045220	Grey	No	
092	0229_MW139_220825	HDPE (no PTFE)	20 mL	00352101033478	Grey	No	
092	0229_MW139_220825	HDPE (no PTFE)	20 mL	00352101052825	Grey	No	
093	0229_MW065_220825	HDPE (no PTFE)	20 mL	00352010065702	Grey	No	
093	0229_MW065_220825	HDPE (no PTFE)	20 mL	00352010065595	Grey	No	
094	0229_MW002_220825	HDPE (no PTFE)	20 mL	00352010065533	Grey	No	
094	0229_MW002_220825	HDPE (no PTFE)	20 mL	00352010065510	Grey	No	
095	0229_MW106_220825	HDPE (no PTFE)	20 mL	00350621051056	Grey	No	
095	0229_MW106_220825	HDPE (no PTFE)	20 mL	00350621051081	Grey	No	
096	0229_MW074_220825	HDPE (no PTFE)	20 mL	00352010065421	Grey	No	
096	0229_MW074_220825	HDPE (no PTFE)	20 mL	00352010065575	Grey	No	
097	0229_MW226_220825	HDPE (no PTFE)	20 mL	00350621051084	Grey	No	
097	0229_MW226_220825	HDPE (no PTFE)	20 mL	00350621051082	Grey	No	
098	0229_MW018_220825	HDPE (no PTFE)	20 mL	00350621051065	Grey	No	
098	0229_MW018_220825	HDPE (no PTFE)	20 mL	00350621050848	Grey	No	
099	0229_MW235S_220825	HDPE (no PTFE)	20 mL	00350821027631	Grey	No	

**CHAIN OF CUSTODY**

COC#: 41522 ALS Laboratory: ET Townsville

RELINQUISHED BY:
DATE TIME:RECEIVED BY:
DATE TIME:RELINQUISHED BY:
DATE TIME:RECEIVED BY: [REDACTED]
DATE TIME: 20/8/22 @ 8:30CLIENT: [REDACTED]
PROJECT: QLD_0229_PASOMP_20
SITE: QLD_0229
ORDER NO:
PROJECT MANAGER: [REDACTED]
PRIMARY SAMPLER: [REDACTED]
EMAIL REPORTS TO: [REDACTED]
EMAIL INVOICES TO: [REDACTED]TURNAROUND REQUIREMENTS : 5 Days
Biohazard info:CONTACT PH: SAMPLER MOBILE:
QUOTE NO: TV/007/21 - Compass / ET2021AECOMAU000
1**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:

099	0229_MW235S_220825	HDPE (no PTFE)	20 mL	00350821027580	Grey	No	
100	0229_MW131_220826	HDPE (no PTFE)	20 mL	00352101033589	Grey	No	
100	0229_MW131_220826	HDPE (no PTFE)	20 mL	00352101052904	Grey	No	
101	0229_QC306_220826	HDPE (no PTFE)	20 mL	00352010065524	Grey	No	
101	0229_QC306_220826	HDPE (no PTFE)	20 mL	00352010065571	Grey	No	

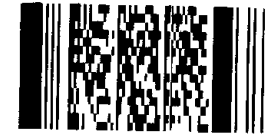
Total Bottle Count: ALS: 193, Non ALS: 0



ALS Compass
SAMPLING *Intelligence*



Environmental Division
Townsville
Work Order Reference
ET2204738



Telephone: +61 7 4773 0000

Custody Document for Submissions via ALS Compass App

Project: 60612487 Client: _____ Project Manager: [Redacted]
Phone: (_____)

ALS Compass COC Reference: 4209 # Samples: 2 Sampler: _____
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: [Redacted]
Date / Time: <u>16:52 05/09/22</u>	Date / Time: <u>5/9/22 16:52</u>	Date / Time:	Date / Time: <u>7/9/22 @ 9:00</u>

RELINQUISHED BY:
 DATE TIME:

RECEIVED BY:
 DATE TIME:

RELINQUISHED BY:
 DATE TIME:

RECEIVED BY: [Redacted]
 DATE TIME: 7/9/22 @ 9:00

CLIENT: [Redacted]
 PROJECT: QLD_0229_PFASOMP_20
 SITE: QLD_0229
 ORDER NO:
 PROJECT MANAGER: [Redacted]
 PRIMARY SAMPLER: [Redacted]
 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:

CONTACT PH: SAMPLER MOBILE:
 QUOTE NO: TV/007/21 - Compass / ET2021AECOMAU000
 1

SAMPLE DETAILS							ANALYSIS REQUIRED			
SAMPLE	NAME	DESCRIPTION	DATE / TIME	MATRIX	TOTAL BOTTLES	ON HOLD	Sediments SEDIMENT	Waters WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
001	0229_SD120_220903		03/09/2022 08:25 AM	Soil	ALS: 1 Non ALS: 0	No	Partial 1/4			
002	0229_QC307_220903		03/09/2022 08:30 AM	Water	ALS: 2 Non ALS: 0	No		Partial 1/4		



CHAIN OF CUSTODY

COC#: 42019 ALS Laboratory: ET Townsville

RELINQUISHED BY:

RECEIVED BY:

RELINQUISHED BY:

BY:

DATE TIME:

DATE TIME:

DATE TIME:

DATE TIME:

7/9/22 @ 9:00

CLIENT: [REDACTED]

PROJECT: QLD_0229_PFASOMP_20

SITE: QLD_0229

ORDER NO:

PROJECT MANAGER: [REDACTED]

PRIMARY SAMPLER: [REDACTED]

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:

CONTACT PH: SAMPLER MOBILE:
QUOTE NO: TV/007/21 - Compass / ET2021AECOMAU000
1

SAMPLE	SAMPLE NAME	PARTIAL ANALYSIS GROUP NAME	MATRIX	SELECTED ANALYSIS NAME
001	0229_SD120_220903	Sediments SEDIMENT	Soil	- EP231X (solids) PFAS - Full Suite (28 analytes)
002	0229_QC307_220903	Waters WATER	Water	- EP231X PFAS - Full Suite (28 analytes)



CHAIN OF CUSTODY

COC#: 42019 ALS Laboratory: ET Townsville

RELINQUISHED BY:

RECEIVED BY:

RELINQUISHED BY:

RECEIVED BY:

DATE TIME:

DATE TIME:

DATE TIME:

DATE TIME:

7/9/22

Q.A.

CLIENT: [REDACTED]

PROJECT: QLD_0229_PASOMP_20

SITE: QLD_0229

ORDER NO:

PROJECT MANAGER: [REDACTED]

PRIMARY SAMPLER: [REDACTED]

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:

CONTACT PH: SAMPLER MOBILE:
QUOTE NO: TV/007/21 - Compass / ET2021AECOMAU000
1

SAMPLE	SAMPLE NAME	BOTTLE NAME	VOLUME	BARCODE	TYPE	FILTERED	REASON
001	0229_SD120_220903	HDPE Soil Jar	200 mL	00620719026312	Grey	No	
002	0229_QC307_220903	HDPE (no PTFE)	20 mL	00350621050446	Grey	No	
002	0229_QC307_220903	HDPE (no PTFE)	20 mL	00350621030228	Grey	No	

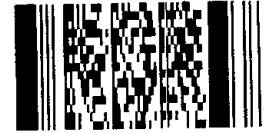
Total Bottle Count: ALS: 3, Non ALS: 0



ALS Compass
SAMPLING *Intelligence*



Environmental Division
Townsville
Work Order Reference
ET2205249



Telephone : +61 7 4773 0000

Custody Document for Submissions via ALS Compass App

Project: _____ Client: _____ Project Manager: _____
Phone: _____

ALS Compass CQC Reference: 43403 # Samples: _____ Sampler: _____
Phone: _____

Turnaround Requirements: Standard _____ Urgent _____

Special Instructions: QLD-0229- PFAS OMP-20)	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: [Redacted]
Date / Time: 10/10/22 0835	Date / Time: 10/10/22 8:35 AM	Date / Time:	Date / Time: 11/10/22 @ 8:40

**CHAIN OF CUSTODY**

COC#: 43403 ALS Laboratory: ET Townsville

RELINQUISHED BY:

RECEIVED BY:

RELINQUISHED BY:

RECEIVED BY:

DATE TIME:

DATE TIME:

DATE TIME:

DATE TIME:

CLIENT: [REDACTED]

PROJECT: QLD_0229_PFASOMP_20

SITE: QLD_0229

ORDER NO:

PROJECT MANAGER: [REDACTED]
PRIMARY SAMPLER: [REDACTED]

EMAIL REPORTS TO: [REDACTED]

EMAIL INVOICES TO: [REDACTED]

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

CONTACT PH: SAMPLER MOBILE:
QUOTE NO: TV/007/21 - Compass / ET2021AECOMAU000
1**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	Waters WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
001	0229_MW131_221007		07/10/2022 05:11 PM	Water	ALS: 2 Non ALS: 0	No	Partial 1/4		
002	0229_SW110_221007		07/10/2022 05:13 PM	Water	ALS: 2 Non ALS: 0	No	Partial 1/4		

RELINQUISHED BY:

RECEIVED BY:

RELINQUISHED BY:

RECEIVED BY:

DATE TIME:

DATE TIME:

DATE TIME:

DATE TIME:

CLIENT: [REDACTED]

PROJECT: QLD_0229_PFASOMP_20

SITE: QLD_0229

ORDER NO:

PROJECT MANAGER: [REDACTED]

PRIMARY SAMPLER: [REDACTED]

EMAIL REPORTS TO: [REDACTED]

EMAIL INVOICES TO: [REDACTED]

CONTACT PH: SAMPLER MOBILE:
 QUOTE NO: TV/007/21 - Compass / ET2021AECOMAU000
 1

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

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

SAMPLE	SAMPLE NAME	PARTIAL ANALYSIS GROUP NAME	MATRIX	SELECTED ANALYSIS NAME
001	0229_MW131_221007	Waters WATER	Water	- EP231X PFAS - Full Suite (28 analytes)
002	0229_SW110_221007	Waters WATER	Water	- EP231X PFAS - Full Suite (28 analytes)

RELINQUISHED BY:

RECEIVED BY:

RELINQUISHED BY:

RECEIVED BY:

DATE TIME:

DATE TIME:

DATE TIME:

DATE TIME:

CLIENT: [REDACTED]

PROJECT: QLD_0229_PFASOMP_20

SITE: QLD_0229

ORDER NO:

PROJECT MANAGER: [REDACTED]

PRIMARY SAMPLER: [REDACTED]

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:

CONTACT PH: SAMPLER MOBILE:
 QUOTE NO: TV/007/21 - Compass / ET2021AECOMAU000
 1

SAMPLE	SAMPLE NAME	BOTTLE NAME	VOLUME	BARCODE	TYPE	FILTERED	REASON
001	0229_MW131_221007	HDPE (no PTFE)	20 mL	00350621018146	Grey	No	
001	0229_MW131_221007	HDPE (no PTFE)	20 mL	00350621018304	Grey	No	
002	0229_SW110_221007	HDPE (no PTFE)	20 mL	00350621017766	Grey	No	
002	0229_SW110_221007	HDPE (no PTFE)	20 mL	00350621017770	Grey	No	

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

CHAIN OF CUSTODY DOCUMENTATION

CLIENT: [REDACTED]	SAMPLER: [REDACTED]
ADDRESS / OFFICE: [REDACTED]	MOBILE: [REDACTED]
PROJECT MANAGER (PM): [REDACTED]	PHONE: [REDACTED]
PROJECT ID: QLD_0229_PFA_SOMP_20	EMAIL REPORT TO: [REDACTED]
SITE: QLD_0229	EMAIL INVOICE TO: (if different to report) [REDACTED]

RESULTS REQUIRED (Date): Standard TAT QUOTE NO.: ANALYSIS REQUIRED Including SUITES (note - suite codes must be listed to attract suite prices)

FOR LABORATORY USE ONLY COOLER SEAL (circle appropriate) Intact: Yes No N/A SAMPLE TEMPERATURE CHILLED: Yes No	COMMENTS / SPECIAL HANDLING / STORAGE OR DISPOSAL:	WATER - PFAS Standard 28 analyses SOIL - PFAS Standard 28 analyses	Notes: e.g. Highly contaminated samples e.g. "High PAHs expected". Extra volume for QC or trace LORs etc.
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AE C006 / 220905 A0
 Due: 14/9/22

SAMPLE INFORMATION (note: S = Soil, W=Water)					CONTAINER INFORMATION		WATER - PFAS Standard 28 analyses	SOIL - PFAS Standard 28 analyses	Barcode	HOLD
ALS ID	SAMPLE ID	MATRIX	DATE	Time	Type / Code	Total bottles				
	0229_QC200_220822	S	22/08/22		1 x P	1		X	N22/017409	
	0229_QC201_220822	W	22/08/22		2 x P	2	X		N22/017410	
	0229_QC202_220822	S	22/08/22		1 x P	1		X	N22/017411	
	0229_QC203_220822	S	22/08/22		1 x P	1		X	N22/017412	
	0229_QC204_220823	W	23/08/22		2 x P	2	X		N22/017413	
	0229_QC205_220823	S	23/08/22		1 x P	1		X	N22/017414	
	0229_QC206_220824	W	24/08/22		2 x P	2	X		N22/017415	
	0229_QC207_220824	W	24/08/22		1 x P	1	X		N22/017416	
	0229_QC208_220824	W	24/08/22		1 x P	1	X		N22/017417	
	0229_QC209_220824	W	24/08/22		1 x P	1	X		N22/017418	
	0229_QC501_220902	W	22/09/22		2 x P	2	X		N22/017419	

RECEIVED
 05 SEP 2022
 BY: [REDACTED] 9:00 C

RELINQUISHED BY: Name: [REDACTED] Of: [REDACTED] Name: [REDACTED] Of: [REDACTED]	2/9/22 Time: 1300 Date: Time:	RECEIVED BY: Name: Of: Name: Of:	METHOD OF SHIPMENT Con' Note No: Transport Co:
--	--	--	--

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

Appendix E

Laboratory Analytical Reports

CERTIFICATE OF ANALYSIS

Work Order : **ET2204738**
Client : ████████████████████
Contact : ████████████████████
Address : PO BOX 5175
 TOWNSVILLE QLD, AUSTRALIA 4870
Telephone : ----
Project : QLD_0229_PFASOMP_20
Order number : 60612487
C-O-C number : 42019
Sampler : ████████████████████
Site : QLD_0229
Quote number : TV/007/21 v2 - Compass
No. of samples received : 2
No. of samples analysed : 2

Page : 1 of 7
Laboratory : Environmental Division Townsville
Contact : ████████████████████
Address : 13 Carlton Street, Kirwan Townsville QLD Australia 4815
Telephone : +61 7 3552 8616
Date Samples Received : 07-Sep-2022 09:00
Date Analysis Commenced : 08-Sep-2022
Issue Date : 14-Sep-2022 17:26



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.

<i>Signatories</i>	<i>Position</i>	<i>Accreditation Category</i>
██████████	Assistant Laboratory Manager	Brisbane Inorganics, Stafford, QLD
██████████	Assistant Laboratory Manager	Brisbane Organics, Stafford, QLD



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.
- \$\$ conducted by ALS Townsville, NATA accreditation no. 825, (Site no. 23472 for Chemical Testing and Site no. 23313 for Biological Testing)
- All remaining analysis will be conducted by ALS Environmental, Brisbane, NATA accreditation no. 825, Site No. 818.
- EP231X PFAS: Sample EB2226245-002 shows poor duplicate results due to sample heterogeneity. Confirmed by visual inspection.
- 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.
- 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: RINSATE (Matrix: WATER)		Sample ID		0229_QC307_220903	----	----	----	----
		Sampling date / time		03-Sep-2022 08:30	----	----	----	----
Compound	CAS Number	LOR	Unit	ET2204738-002	-----	-----	-----	-----
				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	----	----	----	----
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	----	----	----	----



Analytical Results

Sub-Matrix: RINSATE (Matrix: WATER)		Sample ID			0229_QC307_220903	----	----	----	----
		Sampling date / time			03-Sep-2022 08:30	----	----	----	----
Compound	CAS Number	LOR	Unit	ET2204738-002	-----	-----	-----	-----	
				Result	----	----	----	----	
EP231C: Perfluoroalkyl Sulfonamides - Continued									
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	%	79.5	----	----	----	----	
13C8-PFOA	----	0.02	%	100	----	----	----	----	



Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)		Sample ID			0229_SD120_220903	----	----	----	----
		Sampling date / time			03-Sep-2022 08:25	----	----	----	----
Compound	CAS Number	LOR	Unit	ET2204738-001	-----	-----	-----	-----	-----
				Result	----	----	----	----	----
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content	----	0.1	%	0.8	----	----	----	----	----
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	0.0019	----	----	----	----	----
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	----	----	----	----	----
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	----	----	----	----	----



Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)		Sample ID	0229_SD120_220903					
		Sampling date / time	03-Sep-2022 08:25					
Compound	CAS Number	LOR	Unit	ET2204738-001	-----	-----	-----	-----
				Result	----	----	----	----
EP231C: Perfluoroalkyl Sulfonamides - Continued								
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	0.0019	----	----	----	----
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg	0.0019	----	----	----	----
Sum of PFAS (WA DER List)	----	0.0002	mg/kg	0.0019	----	----	----	----
EP231S: PFAS Surrogate								
13C4-PFOS	----	0.0002	%	118	----	----	----	----
13C8-PFOA	----	0.0002	%	96.5	----	----	----	----



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

Inter-Laboratory Testing

Analysis conducted by ALS Brisbane, NATA accreditation no. 825, site no. 818 (Chemistry) 18958 (Biology).

- (SOIL) EP231B: Perfluoroalkyl Carboxylic Acids
- (SOIL) EP231D: (n:2) Fluorotelomer Sulfonic Acids
- (SOIL) EP231C: Perfluoroalkyl Sulfonamides
- (SOIL) EP231A: Perfluoroalkyl Sulfonic Acids
- (SOIL) EP231P: PFAS Sums
- (SOIL) EP231S: PFAS Surrogate
- (SOIL) EA055: Moisture Content (Dried @ 105-110°C)
- (WATER) EP231A: Perfluoroalkyl Sulfonic Acids
- (WATER) EP231B: Perfluoroalkyl Carboxylic Acids
- (WATER) EP231C: Perfluoroalkyl Sulfonamides
- (WATER) EP231D: (n:2) Fluorotelomer Sulfonic Acids
- (WATER) EP231P: PFAS Sums
- (WATER) EP231S: PFAS Surrogate

QUALITY CONTROL REPORT

Work Order : ET2204738 Client : ████████████████████ Contact : ████████████████████ Address : PO BOX 5175 TOWNSVILLE QLD, AUSTRALIA 4870 Telephone : ---- Project : QLD_0229_PFASOMP_20 Order number : 60612487 C-O-C number : 42019 Sampler : ████████████████████ Site : QLD_0229 Quote number : TV/007/21 v2 - Compass No. of samples received : 2 No. of samples analysed : 2	Page : 1 of 9 Laboratory : Environmental Division Townsville Contact : ████████████████████ Address : 13 Carlton Street, Kirwan Townsville QLD Australia 4815 Telephone : +61 7 3552 8616 Date Samples Received : 07-Sep-2022 Date Analysis Commenced : 08-Sep-2022 Issue Date : 14-Sep-2022
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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.

<i>Signatories</i>	<i>Position</i>	<i>Accreditation Category</i>
██████████	Assistant Laboratory Manager	Brisbane Inorganics, Stafford, QLD
██████████	Assistant Laboratory Manager	Brisbane Organics, Stafford, QLD



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: 4567416)									
EB2225228-001	Anonymous	EA055: Moisture Content	----	0.1	%	27.3	27.1	0.9	0% - 20%
EB2226245-002	Anonymous	EA055: Moisture Content	----	0.1	%	32.4	31.6	2.5	0% - 20%
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 4567415)									
EB2225228-001	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	0.0009	0.0010	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	0.0014	0.0008	50.1	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
EB2226245-002	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	0.0008	0.0008	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	0.0013	0.0012	0.0	No Limit
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	0.0238	0.0216	9.7	0% - 20%
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	0.0008	0.0008	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	0.0130	# 0.0178	30.7	0% - 20%
		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: 4567415)									
EB2225228-001	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



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: 4567415) - continued									
EB2225228-001	Anonymous	EP231X: Perfluorotridecanoic acid (PFTTrDA)	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
EB2226245-002	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	0.0007	0.0011	42.8	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	0.0003	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 (PFTTrDA)	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: 4567415)									
EB2225228-001	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
EB2226245-002	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
		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



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: 4567415)									
EB2225228-001	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
EB2226245-002	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

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: 4575310)									
EM2216843-001	Anonymous	EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	0.03	0.02	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	0.17	0.16	7.6	0% - 50%
		EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 4575310)									
EM2216843-001	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: 4575310)									
EM2216843-001	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit



Sub-Matrix: WATER				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 4575310) - continued									
EM2216843-001	Anonymous	EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 4575310)									
EM2216843-001	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: 4575310)									
EM2216843-001	Anonymous	EP231X: Sum of PFAS	----	0.01	µg/L	0.32	0.30	6.5	0% - 20%
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	0.20	0.18	10.5	0% - 20%
		EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	0.32	0.30	6.5	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: **SOIL**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
				Result	Spike Concentration	Spike Recovery (%)	Acceptable Limits (%)	
						LCS	Low	High
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4567415)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	0.0011 mg/kg	90.9	72.0	128
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	0.00117 mg/kg	101	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	88.4	68.0	136
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	0.0012 mg/kg	96.2	59.0	134
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4567415)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	0.00625 mg/kg	91.2	71.0	135
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	0.00125 mg/kg	94.8	69.0	132
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	0.00125 mg/kg	96.8	70.0	132
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	0.00125 mg/kg	98.8	71.0	131
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	98.8	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	104	69.0	133
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	96.0	64.0	136
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	97.2	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	0.00312 mg/kg	90.2	69.0	133
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4567415)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	0.00125 mg/kg	91.6	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	0.00312 mg/kg	110	59.6	143
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	0.00312 mg/kg	91.8	62.8	140
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	0.00312 mg/kg	97.1	61.5	139
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	0.00312 mg/kg	104	61.9	137
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	0.00125 mg/kg	95.2	63.0	144
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	0.00125 mg/kg	98.0	61.0	139
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4567415)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	0.00117 mg/kg	97.0	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	97.0	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	115	65.0	137



Sub-Matrix: **SOIL**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report Result	Laboratory Control Spike (LCS) Report			
					Spike Concentration	Spike Recovery (%)	Acceptable Limits (%)	
						LCS	Low	High
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4567415) - continued								
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	0.0012 mg/kg	121	54.8	124

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report Result	Laboratory Control Spike (LCS) Report			
					Spike Concentration	Spike Recovery (%)	Acceptable Limits (%)	
						LCS	Low	High
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4575310)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.2218 µg/L	119	72.0	130
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.2352 µg/L	112	71.0	127
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	0.2373 µg/L	107	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	88.4	65.0	140
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.241 µg/L	94.8	53.0	142
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4575310)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	1.25 µg/L	121	73.0	129
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	0.25 µg/L	88.2	72.0	129
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	0.25 µg/L	121	72.0	129
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	0.25 µg/L	115	72.0	130
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	0.25 µg/L	120	71.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	0.25 µg/L	97.0	69.0	130
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	0.25 µg/L	103	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	103	72.0	134
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	0.25 µg/L	99.6	65.0	144
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	0.625 µg/L	84.1	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4575310)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.25 µg/L	100	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	102	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	96.0	62.6	138
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	0.25 µg/L	85.4	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: 4575310)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.2343 µg/L	99.9	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	112	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 (%)	Acceptable Limits (%)	
						LCS	Low	High
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4575310) - continued								
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	0.24 µg/L	109	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	100	64.2	133
EP231P: PFAS Sums (QCLot: 4575310)								
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: SOIL

Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report			
				Spike Concentration	Spike Recovery(%) MS	Low	High
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4567415)							
EB2225228-002	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0011 mg/kg	95.0	72.0	128
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.00117 mg/kg	106	73.0	123
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.00118 mg/kg	89.9	67.0	130
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.00119 mg/kg	103	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	94.2	59.0	134
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4567415)							
EB2225228-002	Anonymous	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.00625 mg/kg	88.2	71.0	135
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.00125 mg/kg	91.6	69.0	132
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.00125 mg/kg	110	70.0	132
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.00125 mg/kg	96.0	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	105	72.0	129
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.00125 mg/kg	96.4	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	116	69.0	135
		EP231X: Perfluorotridecanoic acid (PFTTrDA)	72629-94-8	0.00125 mg/kg	105	66.0	139
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.00312 mg/kg	90.5	69.0	133
		EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4567415)					
EB2225228-002	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.00125 mg/kg	85.2	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: 4567415) - continued							
EB2225228-002	Anonymous	EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.00312 mg/kg	99.8	70.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.00312 mg/kg	78.7	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.00312 mg/kg	92.9	70.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.00312 mg/kg	97.1	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.00125 mg/kg	103	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: 4567415)							
EB2225228-002	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.00117 mg/kg	86.3	62.0	145
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.00118 mg/kg	94.9	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0012 mg/kg	108	65.0	137
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0012 mg/kg	78.8	70.0	130

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: ET2204738	Page	: 1 of 5
Client	: [REDACTED]	Laboratory	: Environmental Division Townsville
Contact	: [REDACTED]	Telephone	: [REDACTED]
Project	: QLD_0229_PFASOMP_20	Date Samples Received	: 07-Sep-2022
Site	: QLD_0229	Issue Date	: 14-Sep-2022
Sampler	: [REDACTED]	No. of samples received	: 2
Order number	: 60612487	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** 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: **SOIL**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
Duplicate (DUP) RPDs							
EP231A: Perfluoroalkyl Sulfonic Acids	EB2226245--002	Anonymous	Perfluorooctane sulfonic acid (PFOS)	1763-23-1	30.7 %	0% - 20%	RPD exceeds LOR based limits
Matrix Spike (MS) Recoveries							
EP231A: Perfluoroalkyl Sulfonic Acids	EB2225228--002	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
	QC	Regular	Actual	Expected	
Laboratory Duplicates (DUP)					
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	1	15	6.67	10.00	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)					
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	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: **SOIL**

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

Method	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) 0229_SD120_220903	03-Sep-2022	----	----	----	08-Sep-2022	17-Sep-2022	✓
EP231A: Perfluoroalkyl Sulfonic Acids							
HDPE Soil Jar (EP231X) 0229_SD120_220903	03-Sep-2022	08-Sep-2022	02-Mar-2023	✓	13-Sep-2022	18-Oct-2022	✓
EP231B: Perfluoroalkyl Carboxylic Acids							
HDPE Soil Jar (EP231X) 0229_SD120_220903	03-Sep-2022	08-Sep-2022	02-Mar-2023	✓	13-Sep-2022	18-Oct-2022	✓
EP231C: Perfluoroalkyl Sulfonamides							
HDPE Soil Jar (EP231X) 0229_SD120_220903	03-Sep-2022	08-Sep-2022	02-Mar-2023	✓	13-Sep-2022	18-Oct-2022	✓



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) 0229_SD120_220903	03-Sep-2022	08-Sep-2022	02-Mar-2023	✓	13-Sep-2022	18-Oct-2022	✓
EP231P: PFAS Sums							
HDPE Soil Jar (EP231X) 0229_SD120_220903	03-Sep-2022	08-Sep-2022	02-Mar-2023	✓	13-Sep-2022	18-Oct-2022	✓

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) 0229_QC307_220903	03-Sep-2022	13-Sep-2022	02-Mar-2023	✓	13-Sep-2022	02-Mar-2023	✓
EP231B: Perfluoroalkyl Carboxylic Acids							
HDPE (no PTFE) (EP231X) 0229_QC307_220903	03-Sep-2022	13-Sep-2022	02-Mar-2023	✓	13-Sep-2022	02-Mar-2023	✓
EP231C: Perfluoroalkyl Sulfonamides							
HDPE (no PTFE) (EP231X) 0229_QC307_220903	03-Sep-2022	13-Sep-2022	02-Mar-2023	✓	13-Sep-2022	02-Mar-2023	✓
EP231D: (n:2) Fluorotelomer Sulfonic Acids							
HDPE (no PTFE) (EP231X) 0229_QC307_220903	03-Sep-2022	13-Sep-2022	02-Mar-2023	✓	13-Sep-2022	02-Mar-2023	✓
EP231P: PFAS Sums							
HDPE (no PTFE) (EP231X) 0229_QC307_220903	03-Sep-2022	13-Sep-2022	02-Mar-2023	✓	13-Sep-2022	02-Mar-2023	✓



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	Method	Count		Rate (%)			Quality Control Specification
		QC	Regular	Actual	Expected	Evaluation	
Analytical Methods							
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	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

Matrix: **WATER** Evaluation: ✖ = Quality Control frequency not within specification ; ✔ = Quality Control frequency within specification.

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



SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : ET2204738

Client	:	[REDACTED]	Laboratory	:	Environmental Division Townsville
Contact	:	[REDACTED]	Contact	:	[REDACTED]
Address	:	PO BOX 5175 TOWNSVILLE QLD, AUSTRALIA 4870	Address	:	13 Carlton Street, Kirwan Townsville QLD Australia 4815
E-mail	:	[REDACTED]	E-mail	:	[REDACTED]
Telephone	:	----	Telephone	:	+61 7 3552 8616
Facsimile	:	----	Facsimile	:	
Project	:	QLD_0229_PFASOMP_20	Page	:	1 of 3
Order number	:		Quote number	:	ET2021AECOMAU0001 (TV/007/21 v2 - Compass)
C-O-C number	:	42019	QC Level	:	NEPM 2013 B3 & ALS QC Standard
Site	:	QLD_0229			
Sampler	:	[REDACTED]			

Dates

Date Samples Received	:	07-Sep-2022 09:00	Issue Date	:	07-Sep-2022
Client Requested Due Date	:	14-Sep-2022	Scheduled Reporting Date	:	14-Sep-2022

Delivery Details

Mode of Delivery	:	Carrier	Security Seal	:	Intact.
No. of coolers/boxes	:	1	Temperature	:	2.5°C - Ice present
Receipt Detail	:	MEDIUM ESKY	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
- *Samples were originally received by ALS Townsville on 05/09/2022 and have been forwarded to ALS Brisbane for analysis. Temperature on arrival in ALS Brisbane has been noted above.
- Discounted Package Prices apply only when specific ALS Group Codes ('W', 'S', 'NT' suites) are referenced on COCs.
- \$\$ conducted by ALS Townsville, NATA accreditation no. 825, (Site no. 23472 for Chemical Testing and Site no. 23313 for Biological Testing)
- Please direct any turn around / technical queries to the laboratory contact designated above.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months ± 1 week) from receipt of samples.
- All remaining analysis will be conducted by ALS Environmental, Brisbane, NATA accreditation no. 825, Site No. 818.
- 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.
- **Please refer to the Proactive Holding Time Report table below which summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory. The laboratory will process these samples unless instructions are received from you indicating you do not wish to proceed. The absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.**



Sample 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)
ET2204738-001	03-Sep-2022 08:25	0229_SD120_220903	✓	✓

Matrix: **WATER**

Laboratory sample ID	Sampling date / time	Sample ID	WATER - EP231X PFAS - Full Suite (28 analytes)
ET2204738-002	03-Sep-2022 08:30	0229_QC307_220903	✓

Proactive Holding Time Report

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



Requested Deliverables

ACCOUNTS PAYABLE

- A4 - AU Tax Invoice (INV)

Email

[REDACTED]

[REDACTED]

- *AU Certificate of Analysis - NATA (COA)
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)
- A4 - AU Tax Invoice (INV)
- Chain of Custody (CoC) (COC)
- EDI Format - ENMRG (ENMRG)
- EDI Format - ESDAT (ESDAT)

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DERP ESDAT REPORTS

- EDI Format - ESDAT (ESDAT)

Email

[REDACTED]

[REDACTED]

- *AU Certificate of Analysis - NATA (COA)
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)
- A4 - AU Tax Invoice (INV)
- Chain of Custody (CoC) (COC)
- EDI Format - EQUIS V5 AECOM (EQUIS_V5_AECOM)
- EDI Format - ESDAT (ESDAT)

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

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CERTIFICATE OF ANALYSIS

Work Order : **ET2205249**
Client : ████████████████████
Contact : ████████████████████
Address : LEVEL 5 7-13 TOMLINS STREET
 SOUTH TOWNSVILLE 4810

Telephone : ----
Project : QLD_0229_PFASOMP_20
Order number : 60612487_3.1
C-O-C number : 43403
Sampler : ████████████████████
Site : QLD_0229
Quote number : TV/007/21 v2 - Compass
No. of samples received : 2
No. of samples analysed : 2

Page : 1 of 5
Laboratory : Environmental Division Townsville
Contact : ████████████████████
Address : 13 Carlton Street, Kirwan Townsville QLD Australia 4815

Telephone : +61 7 3552 8616
Date Samples Received : 11-Oct-2022 08:40
Date Analysis Commenced : 12-Oct-2022
Issue Date : 20-Oct-2022 13:51



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.

<i>Signatories</i>	<i>Position</i>	<i>Accreditation Category</i>
██████████████████	2IC Organic Chemist	Brisbane Organics, Stafford, QLD



General Comments

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

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

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

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

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

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

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

- EP231X - Per- and Polyfluoroalkyl Substances (PFAS): Samples received in 20ml or 125ml bottles have been tested in accordance with the QSM5.3 compliant, NATA accredited method. 60mL or 250mL bottles have been tested to the legacy QSM 5.1 aligned, NATA accredited method.
- EP231X PFAS: Whole bottle extraction was not possible for samples '0229_MW131_221007' (ET2205249-001) and '0229_SW110_221007' (ET2205249-002). Samples required dilution prior to extraction due to the presence of high level contaminants. LOR values have been adjusted accordingly.
- All remaining analysis will be conducted by ALS Environmental, Brisbane, NATA accreditation no. 825, Site No. 818.
- 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.
- 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, PFTTrDA and 10:2 FTS. These compounds use an internal standard that is chemically related and has a retention time close to that of the target compound. The DQO for internal standard response is 50-150% of that established at initial calibration. PFOS is quantified using a certified, traceable standard consisting of linear and branched PFOS isomers. These practices are in line with recommendations in the National Environmental Management Plan for PFAS (Australian HEPA) and also conform to QSM 5.3 (US DoD) requirements.



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)		Sample ID		0229_MW131_221007	0229_SW110_221007	----	----	----
		Sampling date / time		07-Oct-2022 17:11	07-Oct-2022 17:13	----	----	----
Compound	CAS Number	LOR	Unit	ET2205249-001	ET2205249-002	-----	-----	-----
				Result	Result	----	----	----
EP231A: Perfluoroalkyl Sulfonic Acids								
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	8.30	2.20	----	----	----
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	7.68	2.56	----	----	----
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	36.8	17.6	----	----	----
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	2.93	1.98	----	----	----
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	45.3	32.9	----	----	----
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.05	<0.05	----	----	----
EP231B: Perfluoroalkyl Carboxylic Acids								
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	1.6	0.7	----	----	----
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	3.08	1.01	----	----	----
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	12.5	4.62	----	----	----
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	2.22	0.62	----	----	----
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	3.60	1.51	----	----	----
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	0.10	0.14	----	----	----
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.05	<0.05	----	----	----
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.05	<0.05	----	----	----
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.05	<0.05	----	----	----
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.05	<0.05	----	----	----
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.12	<0.12	----	----	----
EP231C: Perfluoroalkyl Sulfonamides								
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.05	<0.05	----	----	----
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.12	<0.12	----	----	----
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.12	<0.12	----	----	----



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)		Sample ID		0229_MW131_221007	0229_SW110_221007	----	----	----
		Sampling date / time		07-Oct-2022 17:11	07-Oct-2022 17:13	----	----	----
Compound	CAS Number	LOR	Unit	ET2205249-001	ET2205249-002	-----	-----	-----
				Result	Result	----	----	----
EP231C: Perfluoroalkyl Sulfonamides - Continued								
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.12	<0.12	----	----	----
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.12	<0.12	----	----	----
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.05	<0.05	----	----	----
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.05	<0.05	----	----	----
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	0.44	<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	124	65.8	----	----	----
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	82.1	50.5	----	----	----
Sum of PFAS (WA DER List)	----	0.01	µg/L	114	61.2	----	----	----
EP231S: PFAS Surrogate								
13C4-PFOS	----	0.02	%	97.8	108	----	----	----
13C8-PFOA	----	0.02	%	90.9	105	----	----	----



Surrogate Control Limits

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

Inter-Laboratory Testing

Analysis conducted by ALS Brisbane, NATA accreditation no. 825, site no. 818 (Chemistry) 18958 (Biology).

(WATER) EP231B: Perfluoroalkyl Carboxylic Acids

(WATER) EP231C: Perfluoroalkyl Sulfonamides

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

(WATER) EP231P: PFAS Sums

(WATER) EP231S: PFAS Surrogate

(WATER) EP231A: Perfluoroalkyl Sulfonic Acids

QUALITY CONTROL REPORT

Work Order : ET2205249 Client : ██████████ Contact : ██████████ Address : LEVEL 5 7-13 TOMLINS STREET SOUTH TOWNSVILLE 4810 Telephone : ---- Project : QLD_0229_PFASOMP_20 Order number : 60612487_3.1 C-O-C number : 43403 Sampler : ██████████ Site : QLD_0229 Quote number : TV/007/21 v2 - Compass No. of samples received : 2 No. of samples analysed : 2	Page : 1 of 4 Laboratory : Environmental Division Townsville Contact : ██████████ Address : 13 Carlton Street, Kirwan Townsville QLD Australia 4815 Telephone : +61 7 3552 8616 Date Samples Received : 11-Oct-2022 Date Analysis Commenced : 12-Oct-2022 Issue Date : 20-Oct-2022
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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.

<i>Signatories</i>	<i>Position</i>	<i>Accreditation Category</i>
██████████	2IC Organic Chemist	Brisbane Organics, Stafford, QLD

Page : 2 of 4
Work Order : ET2205249
Client :
Project : QLD_0229_PFASOMP_20



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%.

- **No Laboratory Duplicate (DUP) Results are required to be reported.**



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: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report				
				Result	Spike Concentration	Spike Recovery (%)		Acceptable Limits (%)	
						LCS	Low	High	
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4644296)									
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.2218 µg/L	114	72.0	130	
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.2352 µg/L	123	71.0	127	
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	0.2373 µg/L	110	68.0	131	
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.238 µg/L	128	69.0	134	
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.232 µg/L	114	65.0	140	
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.241 µg/L	111	53.0	142	
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4644296)									
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	107	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	112	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	112	69.0	130	
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	0.25 µg/L	110	71.0	129	
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	0.25 µg/L	104	69.0	133	
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	0.25 µg/L	107	72.0	134	
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	0.25 µg/L	99.2	65.0	144	
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	0.625 µg/L	102	71.0	132	
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4644296)									
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	106	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	
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	112	62.6	138	
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	0.25 µg/L	123	65.0	136	
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	0.25 µg/L	104	61.0	135	
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4644296)									
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.2343 µg/L	105	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	92.1	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	124	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 (%)		Acceptable Limits (%)	
						LCS	Low	High	High
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4644296) - continued									
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	0.241 µg/L	127	64.2	133	
EP231P: PFAS Sums (QCLot: 4644296)									
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	: ET2205249	Page	: 1 of 4
Client	: [REDACTED]	Laboratory	: Environmental Division Townsville
Contact	: [REDACTED]	Telephone	: +61 7 3552 8616
Project	: QLD_0229_PFASOMP_20	Date Samples Received	: 11-Oct-2022
Site	: QLD_0229	Issue Date	: 20-Oct-2022
Sampler	: [REDACTED]	No. of samples received	: 2
Order number	: 60612487_3.1	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

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



Outliers : Frequency of Quality Control Samples

Matrix: **WATER**

Quality Control Sample Type Method	Count		Rate (%)		Quality Control Specification
	QC	Regular	Actual	Expected	
Laboratory Duplicates (DUP)					
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	0	5	0.00	10.00	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)					
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	0	5	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) 0229_MW131_221007,	0229_SW110_221007	07-Oct-2022	18-Oct-2022	05-Apr-2023	✔	18-Oct-2022	05-Apr-2023	✔
EP231B: Perfluoroalkyl Carboxylic Acids								
HDPE (no PTFE) (EP231X) 0229_MW131_221007,	0229_SW110_221007	07-Oct-2022	18-Oct-2022	05-Apr-2023	✔	18-Oct-2022	05-Apr-2023	✔
EP231C: Perfluoroalkyl Sulfonamides								
HDPE (no PTFE) (EP231X) 0229_MW131_221007,	0229_SW110_221007	07-Oct-2022	18-Oct-2022	05-Apr-2023	✔	18-Oct-2022	05-Apr-2023	✔
EP231D: (n:2) Fluorotelomer Sulfonic Acids								
HDPE (no PTFE) (EP231X) 0229_MW131_221007,	0229_SW110_221007	07-Oct-2022	18-Oct-2022	05-Apr-2023	✔	18-Oct-2022	05-Apr-2023	✔
EP231P: PFAS Sums								
HDPE (no PTFE) (EP231X) 0229_MW131_221007,	0229_SW110_221007	07-Oct-2022	18-Oct-2022	05-Apr-2023	✔	18-Oct-2022	05-Apr-2023	✔



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	Method	Count		Rate (%)			Quality Control Specification
		QC	Regular	Actual	Expected	Evaluation	
Analytical Methods							
Laboratory Duplicates (DUP)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	0	5	0.00	10.00	✖	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	5	20.00	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	5	20.00	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	0	5	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.

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



SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : ET2205249

Client	:	[REDACTED]	Laboratory	:	Environmental Division Townsville
Contact	:	[REDACTED]	Contact	:	[REDACTED]
Address	:	LEVEL 5 7-13 TOMLINS STREET SOUTH TOWNSVILLE 4810	Address	:	13 Carlton Street, Kirwan Townsville QLD Australia 4815
E-mail	:	[REDACTED]	E-mail	:	[REDACTED]
Telephone	:	----	Telephone	:	+61 7 3552 8616
Facsimile	:	----	Facsimile	:	
Project	:	QLD_0229_PFASOMP_20	Page	:	1 of 3
Order number	:		Quote number	:	ET2021AECOMAU0001 (TV/007/21 v2 - Compass)
C-O-C number	:	43403	QC Level	:	NEPM 2013 B3 & ALS QC Standard
Site	:	QLD_0229			
Sampler	:	[REDACTED]			

Dates

Date Samples Received	:	11-Oct-2022 08:40	Issue Date	:	12-Oct-2022
Client Requested Due Date	:	19-Oct-2022	Scheduled Reporting Date	:	19-Oct-2022

Delivery Details

Mode of Delivery	:	Carrier	Security Seal	:	Intact.
No. of coolers/boxes	:	3	Temperature	:	4.1/1.4/0.9°C - Ice present
Receipt Detail	:	MEDIUM ESKY	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
- Samples were originally received by ALS Townsville on 10/10/22 and have been forwarded to ALS Brisbane for analysis. Temperature on arrival in ALS Brisbane has been noted above.
- Discounted Package Prices apply only when specific ALS Group Codes ('W', 'S', 'NT' suites) are referenced on COCs.
- Please direct any turn around / technical queries to the laboratory contact designated above.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months ± 1 week) from receipt of samples.
- All remaining analysis will be conducted by ALS Environmental, Brisbane, NATA accreditation no. 825, Site No. 818.
- 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.
- **Please refer to the Proactive Holding Time Report table below which summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory. The laboratory will process these samples unless instructions are received from you indicating you do not wish to proceed. The absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.**



Sample 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)
ET2205249-001	07-Oct-2022 17:11	0229_MW131_221007	✓
ET2205249-002	07-Oct-2022 17:13	0229_SW110_221007	✓

Proactive Holding Time Report

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



Requested Deliverables

ACCOUNTS PAYABLE

- A4 - AU Tax Invoice (INV)

Email

[REDACTED]

[REDACTED]

- *AU Certificate of Analysis - NATA (COA)
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)
- A4 - AU Tax Invoice (INV)
- Chain of Custody (CoC) (COC)
- EDI Format - EQUIS V5 AECOM (EQUIS_V5_AECOM)
- EDI Format - ESDAT (ESDAT)

Email
Email
Email
Email
Email
Email
Email
Email

[REDACTED]

DERP ESDAT REPORTS

- *AU Certificate of Analysis - NATA (COA)
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)
- Chain of Custody (CoC) (COC)
- EDI Format - EQUIS V5 AECOM (EQUIS_V5_AECOM)
- EDI Format - ESDAT (ESDAT)

Email
Email
Email
Email
Email
Email
Email

[REDACTED]

[REDACTED]

- *AU Certificate of Analysis - NATA (COA)
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)
- A4 - AU Tax Invoice (INV)
- Chain of Custody (CoC) (COC)
- EDI Format - EQUIS V5 AECOM (EQUIS_V5_AECOM)
- EDI Format - ESDAT (ESDAT)

Email
Email
Email
Email
Email
Email
Email
Email

[REDACTED]

[REDACTED]

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

Email
Email
Email
Email
Email
Email
Email

[REDACTED]

CERTIFICATE OF ANALYSIS

Work Order : **ET2204605**
Client : ████████████████████
Contact : ████████████████████
Address : LEVEL 5 7-13 TOMLINS STREET
 SOUTH TOWNSVILLE 4810
Telephone : ----
Project : QLD_0229_PFASOMP_20
Order number : 60612487
C-O-C number : 41522
Sampler : ████████████████████
Site : QLD_0229
Quote number : TV/007/21 v2 - Compass
No. of samples received : 107
No. of samples analysed : 107

Page : 1 of 47
Laboratory : Environmental Division Townsville
Contact : ████████████████████
Address : 13 Carlton Street, Kirwan Townsville QLD Australia 4815
Telephone : ████████████████████
Date Samples Received : 30-Aug-2022 08:30
Date Analysis Commenced : 05-Sep-2022
Issue Date : 16-Sep-2022 09:12



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.

<i>Signatories</i>	<i>Position</i>	<i>Accreditation Category</i>
██████████	Non-Metals Team Leader	Melbourne Inorganics, Springvale, VIC
	Senior Organic Chemist	Melbourne Organics, Springvale, VIC



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: Poor surrogate recovery for samples ET2204605 due to sample matrix interference.
- EP231X: Poor matrix spike recovery for samples ET2204605-002,050 due to sample matrix interference.
- EP231X: Samples (ET2204605) required dilution due to high moisture content. LOR values have been adjusted accordingly.
- EP231X: Poor matrix spike recovery for sample ET2204605-069 due to sample matrix interference.
- 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.
- ****Manual Comment****to appear on COA**
- EP231X: Poor matrix spike recovery for sample ET2204605-082 due to sample matrix interference.
- 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.
- 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	0229_SD109_220822	0229_SD110_220822	0229_SD113_220822	0229_SD119_220822	0229_SD129_220822
Sampling date / time				22-Aug-2022 12:30	22-Aug-2022 13:37	22-Aug-2022 12:10	22-Aug-2022 12:02	22-Aug-2022 14:55	
Compound	CAS Number	LOR	Unit	ET2204605-015	ET2204605-017	ET2204605-019	ET2204605-020	ET2204605-022	
				Result	Result	Result	Result	Result	
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content	----	0.1	%	33.2	61.0	14.8	29.1	3.0	
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	0.0031	0.0011	<0.0002	0.0007	0.0002	
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	0.0030	0.0006	<0.0002	0.0007	<0.0002	
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	0.0297	0.0068	<0.0002	0.0023	0.0003	
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	0.0047	0.0008	<0.0002	<0.0002	<0.0002	
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	0.566	0.0780	0.0004	0.0018	0.0009	
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	0.0035	0.0010	<0.0002	<0.0002	<0.0002	
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	<0.002	<0.001	<0.001	<0.001	
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	0.0019	<0.0004	<0.0002	<0.0002	<0.0002	
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	0.0071	0.0012	<0.0002	0.0008	<0.0002	
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	0.0011	<0.0004	<0.0002	<0.0002	<0.0002	
Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	0.0050	0.0008	<0.0002	<0.0002	<0.0002	
Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	0.0007	0.0004	<0.0002	<0.0002	<0.0002	
Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	<0.0004	<0.0002	<0.0002	<0.0002	
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	0.0004	0.0006	<0.0002	<0.0002	<0.0002	
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	0.0003	0.0004	<0.0002	<0.0002	<0.0002	
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	0.0007	0.0006	<0.0002	<0.0002	<0.0002	
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	<0.0009	<0.0005	<0.0005	<0.0005	
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	0.0048	0.0010	<0.0002	<0.0002	<0.0002	
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	<0.0009	<0.0005	<0.0005	<0.0005	



Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)				Sample ID	0229_SD109_220822	0229_SD110_220822	0229_SD113_220822	0229_SD119_220822	0229_SD129_220822
Sampling date / time					22-Aug-2022 12:30	22-Aug-2022 13:37	22-Aug-2022 12:10	22-Aug-2022 12:02	22-Aug-2022 14:55
Compound	CAS Number	LOR	Unit	ET2204605-015	ET2204605-017	ET2204605-019	ET2204605-020	ET2204605-022	ET2204605-022
				Result	Result	Result	Result	Result	Result
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	<0.0009	<0.0005	<0.0005	<0.0005	<0.0005
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	<0.0009	<0.0005	<0.0005	<0.0005	<0.0005
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	<0.0009	<0.0005	<0.0005	<0.0005	<0.0005
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	<0.0004	<0.0002	<0.0002	<0.0002	<0.0002
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	<0.0004	<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	<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	<0.0005
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	0.0008	<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	<0.0005
EP231P: PFAS Sums									
Sum of PFAS	----	0.0002	mg/kg	0.633	0.0933	0.0004	0.0063	0.0014	0.0014
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg	0.596	0.0848	0.0004	0.0041	0.0012	0.0012
Sum of PFAS (WA DER List)	----	0.0002	mg/kg	0.615	0.0879	0.0004	0.0056	0.0014	0.0014
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.0002	%	70.8	92.0	116	63.0	120	120
13C8-PFOA	----	0.0002	%	95.0	80.2	92.5	92.2	99.8	99.8



Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)				Sample ID	0229_SD130_220822	0229_SD132_220822	0229_SD134_220822	0229_SD139_220822	0229_SD140_220822
Sampling date / time				22-Aug-2022 14:45	22-Aug-2022 14:30	22-Aug-2022 14:15	22-Aug-2022 13:40	22-Aug-2022 13:50	
Compound	CAS Number	LOR	Unit	ET2204605-023	ET2204605-024	ET2204605-025	ET2204605-027	ET2204605-029	
				Result	Result	Result	Result	Result	
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content	----	0.1	%	5.6	26.3	17.1	71.2	38.0	
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	0.0004	<0.0002	0.0005	<0.0002	
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	0.0002	<0.0002	<0.0004	<0.0002	
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	0.0003	0.0025	<0.0002	0.0049	0.0010	
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	0.0006	<0.0002	
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	0.0015	0.0108	0.0006	0.0635	0.0170	
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	0.0004	<0.0002	0.0004	<0.0002	
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	<0.001	<0.001	<0.002	<0.001	
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0004	<0.0002	
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	0.0004	<0.0002	0.0009	<0.0002	
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0004	<0.0002	
Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0004	<0.0002	
Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0004	<0.0002	
Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0004	<0.0002	
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0004	<0.0002	
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	<0.0002	0.0003	<0.0004	<0.0002	
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0004	<0.0002	
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	<0.0010	<0.0005	
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0004	<0.0002	
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	<0.0010	<0.0005	



Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)				Sample ID	0229_SD130_220822	0229_SD132_220822	0229_SD134_220822	0229_SD139_220822	0229_SD140_220822
Sampling date / time				22-Aug-2022 14:45	22-Aug-2022 14:30	22-Aug-2022 14:15	22-Aug-2022 13:40	22-Aug-2022 13:50	
Compound	CAS Number	LOR	Unit	ET2204605-023	ET2204605-024	ET2204605-025	ET2204605-027	ET2204605-029	
				Result	Result	Result	Result	Result	
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	<0.0010	<0.0005	
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	<0.0010	<0.0005	
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	<0.0010	<0.0005	
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0004	<0.0002	
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0004	<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	0.0018	0.0147	0.0009	0.0708	0.0180	
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg	0.0018	0.0133	0.0006	0.0684	0.0180	
Sum of PFAS (WA DER List)	----	0.0002	mg/kg	0.0018	0.0141	0.0006	0.0698	0.0180	
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.0002	%	77.0	89.0	87.2	111	98.2	
13C8-PFOA	----	0.0002	%	84.5	88.0	101	72.5	83.5	



Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)				Sample ID	0229_SD205_220822	0229_SD217_220822	0229_SD220_220822	0229_QC100_220822	0229_QC102_220822
Sampling date / time				22-Aug-2022 15:50	22-Aug-2022 11:20	22-Aug-2022 16:10	22-Aug-2022 12:00	22-Aug-2022 12:00	
Compound	CAS Number	LOR	Unit	ET2204605-033	ET2204605-034	ET2204605-036	ET2204605-037	ET2204605-038	
				Result	Result	Result	Result	Result	
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content	----	0.1	%	19.6	34.1	59.4	34.2	25.7	
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	0.0002	0.0005	<0.0002	<0.0002	
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	<0.0002	0.0003	<0.0002	<0.0002	
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	0.0002	0.0062	0.0002	0.0002	
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	<0.0002	0.0005	<0.0002	<0.0002	
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	0.0018	0.0228	0.0018	0.0010	
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	0.0008	<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	0.0006	<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	
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	



Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)				Sample ID	0229_SD205_220822	0229_SD217_220822	0229_SD220_220822	0229_QC100_220822	0229_QC102_220822
Sampling date / time					22-Aug-2022 15:50	22-Aug-2022 11:20	22-Aug-2022 16:10	22-Aug-2022 12:00	22-Aug-2022 12:00
Compound	CAS Number	LOR	Unit	ET2204605-033	ET2204605-034	ET2204605-036	ET2204605-037	ET2204605-038	
				Result	Result	Result	Result	Result	
EP231C: Perfluoroalkyl Sulfonamides - Continued									
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	0.0022	0.0317	0.0020	0.0012	
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg	<0.0002	0.0020	0.0290	0.0020	0.0012	
Sum of PFAS (WA DER List)	----	0.0002	mg/kg	<0.0002	0.0022	0.0303	0.0020	0.0012	
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.0002	%	58.5	85.5	107	85.0	91.0	
13C8-PFOA	----	0.0002	%	112	97.5	80.6	88.3	85.9	



Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)		Sample ID		0229_QC103_220822	0229_SD232_220822	0229_SD211_220825	0229_SD212_220825	----
		Sampling date / time		22-Aug-2022 12:00	22-Aug-2022 13:10	25-Aug-2022 16:12	25-Aug-2022 07:45	----
Compound	CAS Number	LOR	Unit	ET2204605-039	ET2204605-049	ET2204605-086	ET2204605-087	-----
				Result	Result	Result	Result	----
EA055: Moisture Content (Dried @ 105-110°C)								
Moisture Content	----	0.1	%	35.2	46.9	40.8	27.9	----
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	0.0015	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	0.0099	0.0010	<0.0002	0.0003	----
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	0.0004	<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	----
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	<0.0005	----



Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)				Sample ID	0229_QC103_220822	0229_SD232_220822	0229_SD211_220825	0229_SD212_220825	----
Sampling date / time				22-Aug-2022 12:00	22-Aug-2022 13:10	25-Aug-2022 16:12	25-Aug-2022 07:45	----	----
Compound	CAS Number	LOR	Unit	ET2204605-039	ET2204605-049	ET2204605-086	ET2204605-087	-----	----
				Result	Result	Result	Result	----	----
EP231C: Perfluoroalkyl Sulfonamides - Continued									
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	0.0118	0.0012	<0.0002	0.0003	----	----
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg	0.0114	0.0012	<0.0002	0.0003	----	----
Sum of PFAS (WA DER List)	----	0.0002	mg/kg	0.0114	0.0012	<0.0002	0.0003	----	----
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.0002	%	83.7	88.0	105	93.3	----	----
13C8-PFOA	----	0.0002	%	79.7	96.6	79.6	94.5	----	----



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	0229_SD136_220823	0229_SD133_220823	0229_SD128_220823	0229_SD126_220823	0229_QC105_220823
Sampling date / time				23-Aug-2022 10:00	23-Aug-2022 10:35	23-Aug-2022 10:54	23-Aug-2022 11:20	23-Aug-2022 11:21	
Compound	CAS Number	LOR	Unit	ET2204605-001	ET2204605-002	ET2204605-003	ET2204605-004	ET2204605-005	
				Result	Result	Result	Result	Result	
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content	----	0.1	%	32.1	43.5	26.4	18.0	13.6	
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	0.0008	<0.0002	0.0003	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	0.0075	0.0020	0.0026	0.0034	0.0015	
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	0.0003	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	
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	0229_SD136_220823	0229_SD133_220823	0229_SD128_220823	0229_SD126_220823	0229_QC105_220823
Sampling date / time				23-Aug-2022 10:00	23-Aug-2022 10:35	23-Aug-2022 10:54	23-Aug-2022 11:20	23-Aug-2022 11:21	
Compound	CAS Number	LOR	Unit	ET2204605-001	ET2204605-002	ET2204605-003	ET2204605-004	ET2204605-005	
				Result	Result	Result	Result	Result	
EP231C: Perfluoroalkyl Sulfonamides - Continued									
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	0.0083	0.0020	0.0029	0.0041	0.0019	
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg	0.0083	0.0020	0.0029	0.0036	0.0015	
Sum of PFAS (WA DER List)	----	0.0002	mg/kg	0.0083	0.0020	0.0029	0.0036	0.0015	
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.0002	%	86.2	99.8	80.8	86.8	108	
13C8-PFOA	----	0.0002	%	88.0	90.8	86.2	88.5	86.5	



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	0229_SD245_220823	0229_SD244_220823	0229_SD227_220823	0229_SD203_220822	0229_SD243_220822
Sampling date / time					23-Aug-2022 09:10	23-Aug-2022 10:30	23-Aug-2022 11:40	22-Aug-2022 12:05	22-Aug-2022 12:40
Compound	CAS Number	LOR	Unit	ET2204605-008	ET2204605-010	ET2204605-012	ET2204605-035	ET2204605-045	
				Result	Result	Result	Result	Result	
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content	----	0.1	%	46.5	21.8	30.9	25.5	30.4	
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	0.0005	<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	
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	0229_SD245_220823	0229_SD244_220823	0229_SD227_220823	0229_SD203_220822	0229_SD243_220822
Sampling date / time				23-Aug-2022 09:10	23-Aug-2022 10:30	23-Aug-2022 11:40	22-Aug-2022 12:05	22-Aug-2022 12:40	
Compound	CAS Number	LOR	Unit	ET2204605-008	ET2204605-010	ET2204605-012	ET2204605-035	ET2204605-045	
				Result	Result	Result	Result	Result	
EP231C: Perfluoroalkyl Sulfonamides - Continued									
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	0.0005	<0.0002	
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	0.0005	<0.0002	
Sum of PFAS (WA DER List)	----	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	0.0005	<0.0002	
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.0002	%	104	71.8	97.5	75.2	99.5	
13C8-PFOA	----	0.0002	%	93.5	90.8	81.8	86.5	87.2	



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	0229_SD242_220822	0229_SD233_220822	0229_SD121_220822	0229_SD135_220822	0229_SD144_220822
Sampling date / time				22-Aug-2022 13:45	22-Aug-2022 15:25	22-Aug-2022 11:10	22-Aug-2022 11:55	22-Aug-2022 14:40	
Compound	CAS Number	LOR	Unit	ET2204605-047	ET2204605-048	ET2204605-102	ET2204605-103	ET2204605-107	
				Result	Result	Result	Result	Result	
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content	----	0.1	%	43.6	49.0	73.0	25.6	29.8	
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	<0.0002	0.0008	<0.0002	<0.0002	
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	<0.0002	0.0008	<0.0002	<0.0002	
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	0.0002	0.0020	0.0082	<0.0002	0.0004	
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	<0.0002	0.0010	<0.0002	<0.0002	
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	0.0051	0.0184	0.0541	0.0014	0.0201	
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	0.0003	<0.0002	<0.0002	
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	0.0003	0.0021	<0.0002	<0.0002	
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	<0.0002	0.0003	<0.0002	<0.0002	
Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	<0.0002	0.0020	<0.0002	<0.0002	
Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	<0.0002	0.0015	<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	0.0003	<0.0002	<0.0002	
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	0.0004	0.0003	<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	
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	0229_SD242_220822	0229_SD233_220822	0229_SD121_220822	0229_SD135_220822	0229_SD144_220822
Sampling date / time				22-Aug-2022 13:45	22-Aug-2022 15:25	22-Aug-2022 11:10	22-Aug-2022 11:55	22-Aug-2022 14:40	
Compound	CAS Number	LOR	Unit	ET2204605-047	ET2204605-048	ET2204605-102	ET2204605-103	ET2204605-107	
				Result	Result	Result	Result	Result	
EP231C: Perfluoroalkyl Sulfonamides - Continued									
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	0.0057	0.0210	0.0714	0.0014	0.0205	
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg	0.0053	0.0204	0.0623	0.0014	0.0205	
Sum of PFAS (WA DER List)	----	0.0002	mg/kg	0.0053	0.0207	0.0678	0.0014	0.0205	
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.0002	%	100	75.1	106	73.2	102	
13C8-PFOA	----	0.0002	%	79.9	91.2	90.8	98.8	93.8	



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	0229_SW233_220822	0229_QC104_220822	0229_SW245_220822	0229_SW244_220822	0229_SW227_220822
				Sampling date / time	22-Aug-2022 11:45	22-Aug-2022 12:00	22-Aug-2022 09:10	22-Aug-2022 10:30	22-Aug-2022 11:40
Compound	CAS Number	LOR	Unit	ET2204605-006	ET2204605-007	ET2204605-009	ET2204605-011	ET2204605-013	
				Result	Result	Result	Result	Result	
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	0.13	0.13	<0.02	<0.02	<0.02	
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	0.09	0.09	<0.02	<0.02	<0.02	
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	0.68	0.67	<0.01	<0.01	<0.01	
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	0.04	0.04	<0.02	<0.02	<0.02	
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	0.68	0.66	<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	0.04	0.04	<0.02	<0.02	<0.02	
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	0.15	0.16	<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	0.05	0.04	<0.01	<0.01	<0.01	
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02	
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02	
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02	
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02	
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02	
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05	
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02	
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05	
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05	



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	0229_SW233_220822	0229_QC104_220822	0229_SW245_220822	0229_SW244_220822	0229_SW227_220822
Sampling date / time					22-Aug-2022 11:45	22-Aug-2022 12:00	22-Aug-2022 09:10	22-Aug-2022 10:30	22-Aug-2022 11:40
Compound	CAS Number	LOR	Unit	ET2204605-006	ET2204605-007	ET2204605-009	ET2204605-011	ET2204605-013	
				Result	Result	Result	Result	Result	
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	<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	<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	<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	<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	<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	<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	<0.05
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L	1.88	1.85	<0.01	<0.01	<0.01	<0.01
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	1.36	1.33	<0.01	<0.01	<0.01	<0.01
Sum of PFAS (WA DER List)	----	0.01	µg/L	1.75	1.72	<0.01	<0.01	<0.01	<0.01
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%	93.8	90.3	99.8	97.0	91.9	
13C8-PFOA	----	0.02	%	101	97.9	99.9	98.1	100	



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	0229_SW109_220822	0229_SW110_220822	0229_SW113_220822	0229_SW121_220822	0229_SW135_220822
Sampling date / time					22-Aug-2022 12:30	22-Aug-2022 13:37	22-Aug-2022 12:20	22-Aug-2022 11:10	22-Aug-2022 11:55
Compound	CAS Number	LOR	Unit	ET2204605-014	ET2204605-016	ET2204605-018	ET2204605-021	ET2204605-026	
				Result	Result	Result	Result	Result	
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	7.41	3.36	0.05	0.24	0.06	
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	8.48	3.36	0.02	0.16	0.02	
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	55.6	25.4	0.15	0.97	0.20	
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	5.98	2.78	<0.02	0.03	<0.02	
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	109	47.7	0.05	0.48	0.30	
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	0.08	<0.02	<0.02	<0.02	<0.02	
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	1.4	0.6	<0.1	<0.1	<0.1	
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	3.34	1.28	<0.02	0.05	<0.02	
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	14.8	7.21	<0.02	0.29	<0.02	
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	2.63	0.96	<0.02	0.03	<0.02	
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	6.36	2.54	<0.01	0.05	<0.01	
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	0.33	0.21	<0.02	<0.02	<0.02	
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.04	<0.02	<0.02	<0.02	<0.02	
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.04	<0.02	<0.02	<0.02	<0.02	
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.04	<0.02	<0.02	<0.02	<0.02	
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.04	<0.02	<0.02	<0.02	<0.02	
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.10	<0.05	<0.05	<0.05	<0.05	
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	0.18	0.06	<0.02	<0.02	<0.02	
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.10	<0.05	<0.05	<0.05	<0.05	
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.10	<0.05	<0.05	<0.05	<0.05	



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	0229_SW109_220822	0229_SW110_220822	0229_SW113_220822	0229_SW121_220822	0229_SW135_220822
Sampling date / time					22-Aug-2022 12:30	22-Aug-2022 13:37	22-Aug-2022 12:20	22-Aug-2022 11:10	22-Aug-2022 11:55
Compound	CAS Number	LOR	Unit	ET2204605-014	ET2204605-016	ET2204605-018	ET2204605-021	ET2204605-026	ET2204605-026
				Result	Result	Result	Result	Result	Result
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.10	<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.10	<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.04	<0.02	<0.02	<0.02	<0.02	<0.02
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.04	<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	<0.05
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	0.33	0.11	<0.05	<0.05	<0.05	<0.05
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	0.07	<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	<0.05
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L	216	95.6	0.27	2.30	0.58	0.58
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	165	73.1	0.20	1.45	0.50	0.50
Sum of PFAS (WA DER List)	----	0.01	µg/L	201	89.2	0.25	2.11	0.56	0.56
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%	129	94.0	94.5	97.1	98.4	98.4
13C8-PFOA	----	0.02	%	102	97.3	99.0	97.7	100	100



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	0229_SW139_220822	0229_SW140_220822	0229_SW217_220822	0229_SW205_220822	0229_QC301_220822
Sampling date / time					22-Aug-2022 13:40	22-Aug-2022 13:40	22-Aug-2022 11:20	22-Aug-2022 15:50	22-Aug-2022 17:00
Compound	CAS Number	LOR	Unit	ET2204605-028	ET2204605-030	ET2204605-031	ET2204605-032	ET2204605-040	
				Result	Result	Result	Result	Result	
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05	
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05	
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02	
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02	
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05	
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05	
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05	
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05	
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L	2.45	2.50	0.04	0.05	<0.01	
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	1.82	1.88	0.04	0.05	<0.01	
Sum of PFAS (WA DER List)	----	0.01	µg/L	2.30	2.35	0.04	0.05	<0.01	
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%	93.1	95.0	91.7	92.1	93.7	
13C8-PFOA	----	0.02	%	99.0	100	97.0	101	101	



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	0229_QC500_220822	0229_QC101_220822	0229_QC300_220822	0229_SW243_220822	0229_SW242_220822
				Sampling date / time	22-Aug-2022 10:00	22-Aug-2022 12:00	22-Aug-2022 16:20	22-Aug-2022 12:40	22-Aug-2022 13:45
Compound	CAS Number	LOR	Unit		ET2204605-041	ET2204605-042	ET2204605-043	ET2204605-044	ET2204605-046
					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	0.06
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	0.06
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		<0.1	<0.1	<0.1	<0.1	<0.1
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	0229_QC500_220822	0229_QC101_220822	0229_QC300_220822	0229_SW243_220822	0229_SW242_220822
Sampling date / time				22-Aug-2022 10:00	22-Aug-2022 12:00	22-Aug-2022 16:20	22-Aug-2022 12:40	22-Aug-2022 13:45	
Compound	CAS Number	LOR	Unit	ET2204605-041	ET2204605-042	ET2204605-043	ET2204605-044	ET2204605-046	
				Result	Result	Result	Result	Result	
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05	
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05	
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02	
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02	
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05	
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05	
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05	
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05	
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L	<0.01	0.01	<0.01	0.03	0.12	
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	<0.01	0.01	<0.01	0.03	0.12	
Sum of PFAS (WA DER List)	----	0.01	µg/L	<0.01	0.01	<0.01	0.03	0.12	
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%	85.4	84.9	90.3	90.1	90.7	
13C8-PFOA	----	0.02	%	103	97.3	96.4	99.3	109	



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	0229_SW232_220822	0229_SW220_220822	0229_SW203_220822	0229_QC302_220823	0229_MW125S_220824
Sampling date / time					22-Aug-2022 13:10	22-Aug-2022 16:10	22-Aug-2022 12:05	23-Aug-2022 17:00	24-Aug-2022 08:51
Compound	CAS Number	LOR	Unit	ET2204605-050	ET2204605-051	ET2204605-052	ET2204605-053	ET2204605-054	ET2204605-054
				Result	Result	Result	Result	Result	Result
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	0.02	0.17	0.06	<0.02	0.12	
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.14	0.03	<0.02	0.08	
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	0.04	1.34	0.19	<0.01	0.68	
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.05	<0.02	<0.02	<0.02	
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	0.03	0.74	0.21	<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	
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1	
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	0.04	<0.02	<0.02	0.05	
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	0.22	0.02	<0.02	0.21	
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	0.04	<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	



Analytical Results

Sub-Matrix: WATER
 (Matrix: WATER)

Sample ID

				0229_SW232_220822	0229_SW220_220822	0229_SW203_220822	0229_QC302_220823	0229_MW125S_220824
				22-Aug-2022 13:10	22-Aug-2022 16:10	22-Aug-2022 12:05	23-Aug-2022 17:00	24-Aug-2022 08:51
Compound	CAS Number	LOR	Unit	ET2204605-050	ET2204605-051	ET2204605-052	ET2204605-053	ET2204605-054
				Result	Result	Result	Result	Result
EP231C: Perfluoroalkyl Sulfonamides - Continued								
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02
EP231D: (n:2) Fluorotelomer Sulfonic Acids								
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05
EP231P: PFAS Sums								
Sum of PFAS	----	0.01	µg/L	0.09	2.80	0.51	<0.01	1.17
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	0.07	2.08	0.40	<0.01	0.70
Sum of PFAS (WA DER List)	----	0.01	µg/L	0.09	2.57	0.48	<0.01	1.09
EP231S: PFAS Surrogate								
13C4-PFOS	----	0.02	%	95.6	98.3	88.2	99.2	95.1
13C8-PFOA	----	0.02	%	99.8	97.0	96.9	102	99.0



Analytical Results

Sub-Matrix: WATER
 (Matrix: WATER)

Sample ID

				0229_MW125I_22082 4	0229_MW124_220824	0229_MW123I_22082 4	0229_MW105_220824	0229_MW217_220824
Sampling date / time				24-Aug-2022 08:52	24-Aug-2022 09:01	24-Aug-2022 09:18	24-Aug-2022 10:00	24-Aug-2022 09:19
Compound	CAS Number	LOR	Unit	ET2204605-055 Result	ET2204605-056 Result	ET2204605-057 Result	ET2204605-058 Result	ET2204605-059 Result
EP231A: Perfluoroalkyl Sulfonic Acids								
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	0.03	<0.02	0.22	4.16	<0.02
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	<0.02	0.20	5.94	<0.02
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	0.15	<0.01	0.75	35.4	0.01
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	<0.02	<0.02	1.95	<0.02
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	0.03	<0.01	<0.01	25.3	<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	0.4	<0.1
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	<0.02	<0.02	1.47	<0.02
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	0.03	<0.02	0.11	8.50	<0.02
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	<0.02	<0.02	1.05	<0.02
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	<0.01	<0.01	1.65	<0.01
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	<0.02	<0.02	0.11	<0.02
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05
EP231C: Perfluoroalkyl Sulfonamides								
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	0229_MW125I_22082	0229_MW124_220824	0229_MW123I_22082	0229_MW105_220824	0229_MW217_220824
					4		4		
Sampling date / time					24-Aug-2022 08:52	24-Aug-2022 09:01	24-Aug-2022 09:18	24-Aug-2022 10:00	24-Aug-2022 09:19
Compound	CAS Number	LOR	Unit		ET2204605-055	ET2204605-056	ET2204605-057	ET2204605-058	ET2204605-059
					Result	Result	Result	Result	Result
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		<0.05	<0.05	<0.05	0.20	<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		0.24	<0.01	1.28	86.1	0.01
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		0.18	<0.01	0.75	60.7	0.01
Sum of PFAS (WA DER List)	----	0.01	µg/L		0.24	<0.01	1.08	78.1	0.01
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		86.5	88.9	94.0	96.7	87.5
13C8-PFOA	----	0.02	%		103	102	97.2	101	99.1



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	0229_MW212_220824	0229_QC106_220824	0229_MW128_220824	0229_QC107_220824	0229_MW102_220824
Sampling date / time				24-Aug-2022 09:58	24-Aug-2022 09:59	24-Aug-2022 10:09	24-Aug-2022 10:10	24-Aug-2022 10:25	
Compound	CAS Number	LOR	Unit	ET2204605-060	ET2204605-061	ET2204605-062	ET2204605-063	ET2204605-064	
				Result	Result	Result	Result	Result	
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	<0.02	17.5	16.8	0.46	
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	<0.02	20.5	20.1	0.33	
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	<0.01	163	162	2.11	
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	<0.02	9.26	9.29	0.15	
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	<0.01	152	148	1.04	
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	<0.02	0.04	<0.04	<0.02	
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	<0.1	3.0	3.1	<0.1	
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	<0.02	7.83	7.82	0.11	
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	<0.02	38.4	38.9	0.34	
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	<0.02	4.37	4.35	0.08	
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	<0.01	8.35	8.16	0.16	
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	<0.02	3.09	3.23	<0.02	
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	<0.02	0.05	0.06	<0.02	
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	<0.02	<0.04	<0.04	<0.02	
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	<0.02	<0.04	<0.04	<0.02	
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	<0.02	<0.04	<0.04	<0.02	
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	<0.05	<0.09	<0.10	<0.05	
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	<0.02	0.14	0.14	<0.02	
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	<0.05	<0.09	<0.10	<0.05	
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	<0.05	<0.09	<0.10	<0.05	



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	0229_MW212_220824	0229_QC106_220824	0229_MW128_220824	0229_QC107_220824	0229_MW102_220824
Sampling date / time				24-Aug-2022 09:58	24-Aug-2022 09:59	24-Aug-2022 10:09	24-Aug-2022 10:10	24-Aug-2022 10:25	
Compound	CAS Number	LOR	Unit	ET2204605-060	ET2204605-061	ET2204605-062	ET2204605-063	ET2204605-064	
				Result	Result	Result	Result	Result	
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	<0.05	<0.09	<0.10	<0.05	
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	<0.05	<0.09	<0.10	<0.05	
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	<0.02	<0.04	<0.04	<0.02	
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	<0.02	<0.04	<0.04	<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	0.08	0.10	<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	428	422	4.78	
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	<0.01	<0.01	315	310	3.15	
Sum of PFAS (WA DER List)	----	0.01	µg/L	<0.01	<0.01	394	389	4.30	
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%	90.5	94.9	88.0	81.4	87.2	
13C8-PFOA	----	0.02	%	95.1	93.5	104	100	97.9	



Analytical Results

Sub-Matrix: WATER
 (Matrix: WATER)

Sample ID

				0229_MW233_220824	0229_QC108_220824	0229_MW003_220824	0229_MW220S_22082 4	0229_MW122_220824
Sampling date / time				24-Aug-2022 10:17	24-Aug-2022 10:26	24-Aug-2022 10:34	24-Aug-2022 10:51	24-Aug-2022 11:08
Compound	CAS Number	LOR	Unit	ET2204605-065	ET2204605-066	ET2204605-067	ET2204605-068	ET2204605-069
				Result	Result	Result	Result	Result
EP231A: Perfluoroalkyl Sulfonic Acids								
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.42	<0.02	0.04	0.17
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.35	<0.02	0.02	0.17
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	2.13	<0.01	0.13	1.25
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.15	<0.02	<0.02	0.10
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	1.07	<0.01	<0.01	2.88
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	0.10	<0.02	<0.02	0.03
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	0.31	<0.02	<0.02	0.13
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	0.08	<0.02	<0.02	0.02
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	0.16	<0.01	<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	<0.02	<0.02	<0.02	<0.02
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05



Analytical Results

Sub-Matrix: WATER
 (Matrix: WATER)

Sample ID

				0229_MW233_220824	0229_QC108_220824	0229_MW003_220824	0229_MW220S_220824 4	0229_MW122_220824
Sampling date / time				24-Aug-2022 10:17	24-Aug-2022 10:26	24-Aug-2022 10:34	24-Aug-2022 10:51	24-Aug-2022 11:08
Compound	CAS Number	LOR	Unit	ET2204605-065	ET2204605-066	ET2204605-067	ET2204605-068	ET2204605-069
				Result	Result	Result	Result	Result
EP231C: Perfluoroalkyl Sulfonamides - Continued								
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02
EP231D: (n:2) Fluorotelomer Sulfonic Acids								
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05
EP231P: PFAS Sums								
Sum of PFAS	----	0.01	µg/L	<0.01	4.77	<0.01	0.19	4.83
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	<0.01	3.20	<0.01	0.13	4.13
Sum of PFAS (WA DER List)	----	0.01	µg/L	<0.01	4.27	<0.01	0.17	4.56
EP231S: PFAS Surrogate								
13C4-PFOS	----	0.02	%	99.5	87.1	86.8	93.3	99.9
13C8-PFOA	----	0.02	%	103	101	100	98.7	102



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	0229_MW121_220824	0229_MW101_220824	0229_MW141_220824	0229_MW116_220824	0229_MW115_220824
Sampling date / time				24-Aug-2022 11:20	24-Aug-2022 11:43	24-Aug-2022 12:35	24-Aug-2022 11:38	24-Aug-2022 12:03	
Compound	CAS Number	LOR	Unit	ET2204605-070	ET2204605-071	ET2204605-072	ET2204605-073	ET2204605-074	
				Result	Result	Result	Result	Result	
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	0.04	0.43	0.17	0.10	0.10	
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	0.04	0.14	0.15	0.03	0.04	
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	0.30	0.53	1.12	0.10	0.16	
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	<0.02	0.04	<0.02	<0.02	
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	0.07	0.37	0.52	<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	
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	<0.02	<0.02	
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	0.07	0.28	0.03	0.07	
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	0.04	<0.01	<0.01	
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02	
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02	
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02	
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02	
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02	
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05	
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02	
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05	
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05	



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	0229_MW121_220824	0229_MW101_220824	0229_MW141_220824	0229_MW116_220824	0229_MW115_220824
Sampling date / time				24-Aug-2022 11:20	24-Aug-2022 11:43	24-Aug-2022 12:35	24-Aug-2022 11:38	24-Aug-2022 12:03	
Compound	CAS Number	LOR	Unit	ET2204605-070	ET2204605-071	ET2204605-072	ET2204605-073	ET2204605-074	
				Result	Result	Result	Result	Result	
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05	
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05	
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02	
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02	
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05	
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05	
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05	
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05	
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L	0.45	1.55	2.37	0.26	0.47	
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	0.37	0.90	1.64	0.10	0.26	
Sum of PFAS (WA DER List)	----	0.01	µg/L	0.41	1.41	2.18	0.23	0.43	
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%	95.6	104	106	96.2	102	
13C8-PFOA	----	0.02	%	92.8	104	94.4	97.5	94.2	



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	0229_QC109_220824	0229_MW118_220824	0229_MW119_220824	0229_MW135_220824	0229_MW114_220824
				Sampling date / time	24-Aug-2022 12:41	24-Aug-2022 13:08	24-Aug-2022 13:30	24-Aug-2022 14:00	24-Aug-2022 14:25
Compound	CAS Number	LOR	Unit	ET2204605-075	ET2204605-076	ET2204605-077	ET2204605-078	ET2204605-079	
				Result	Result	Result	Result	Result	
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	0.18	0.05	0.27	0.07	2.12	
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	0.15	<0.02	<0.02	0.07	2.36	
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	1.15	0.03	0.05	0.63	12.6	
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	0.04	<0.02	<0.02	0.04	0.70	
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	0.50	<0.01	0.02	0.55	2.09	
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	0.3	
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	0.05	<0.02	0.16	<0.02	0.78	
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	0.27	<0.02	0.17	0.02	4.57	
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	0.02	<0.02	0.13	<0.02	0.73	
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	0.04	<0.01	0.11	0.02	1.07	
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	<0.02	<0.02	<0.02	<0.02	
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05	
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05	



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	0229_QC109_220824	0229_MW118_220824	0229_MW119_220824	0229_MW135_220824	0229_MW114_220824
Sampling date / time					24-Aug-2022 12:41	24-Aug-2022 13:08	24-Aug-2022 13:30	24-Aug-2022 14:00	24-Aug-2022 14:25
Compound	CAS Number	LOR	Unit	ET2204605-075	ET2204605-076	ET2204605-077	ET2204605-078	ET2204605-079	ET2204605-079
				Result	Result	Result	Result	Result	Result
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	<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	<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	<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	<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	<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	<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	<0.05
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L	2.40	0.08	0.91	1.40	27.3	
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	1.65	0.03	0.07	1.18	14.7	
Sum of PFAS (WA DER List)	----	0.01	µg/L	2.21	0.08	0.91	1.29	24.3	
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%	102	99.6	98.7	97.2	96.8	
13C8-PFOA	----	0.02	%	96.1	100	101	99.6	99.2	



Analytical Results

Sub-Matrix: WATER
 (Matrix: WATER)

Sample ID

				0229_MW120_220824	0229_MW236S_22082 4	0229_MW138_220824	0229_MW205S_22082 4	0229_QC303_220824
Sampling date / time				24-Aug-2022 14:35	24-Aug-2022 14:41	24-Aug-2022 14:50	24-Aug-2022 15:10	24-Aug-2022 15:26
Compound	CAS Number	LOR	Unit	ET2204605-080	ET2204605-081	ET2204605-082	ET2204605-083	ET2204605-084
				Result	Result	Result	Result	Result
EP231A: Perfluoroalkyl Sulfonic Acids								
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	0.10	0.04	0.80	<0.02	<0.02
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	<0.02	0.85	<0.02	<0.02
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	0.06	0.08	5.03	0.03	<0.01
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	<0.02	0.38	<0.02	<0.02
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	0.10	0.19	6.04	0.02	<0.01
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02
EP231B: Perfluoroalkyl Carboxylic Acids								
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	<0.1	0.1	<0.1	<0.1
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	<0.02	0.24	<0.02	<0.02
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	<0.02	1.17	<0.02	<0.02
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	<0.02	0.18	<0.02	<0.02
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	0.01	0.32	<0.01	<0.01
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	<0.02	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



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	0229_MW120_220824	0229_MW236S_22082 4	0229_MW138_220824	0229_MW205S_22082 4	0229_QC303_220824
Sampling date / time					24-Aug-2022 14:35	24-Aug-2022 14:41	24-Aug-2022 14:50	24-Aug-2022 15:10	24-Aug-2022 15:26
Compound	CAS Number	LOR	Unit	ET2204605-080	ET2204605-081	ET2204605-082	ET2204605-083	ET2204605-084	ET2204605-084
				Result	Result	Result	Result	Result	Result
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	<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	<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	<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	<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	<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	<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	<0.05
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L	0.26	0.32	15.2	0.05	<0.01	<0.01
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	0.16	0.27	11.1	0.05	<0.01	<0.01
Sum of PFAS (WA DER List)	----	0.01	µg/L	0.26	0.32	13.9	0.05	<0.01	<0.01
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%	99.1	91.7	97.7	94.2	112	112
13C8-PFOA	----	0.02	%	85.5	96.3	97.2	94.0	97.8	97.8



Analytical Results

Sub-Matrix: WATER
 (Matrix: WATER)

Sample ID

				0229_MW232_220824	0229_SW211_220825	0229_SW212_220825	0229_MW123S_22082 5	0229_MW072_220825
Sampling date / time				24-Aug-2022 15:38	25-Aug-2022 07:00	25-Aug-2022 07:00	25-Aug-2022 11:30	25-Aug-2022 13:05
Compound	CAS Number	LOR	Unit	ET2204605-085	ET2204605-088	ET2204605-089	ET2204605-090	ET2204605-091
				Result	Result	Result	Result	Result
EP231A: Perfluoroalkyl Sulfonic Acids								
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	0.14	<0.02	0.04	0.74	5.34
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	<0.02	<0.02	0.66	5.92
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	0.09	<0.01	0.04	10.2	37.2
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	<0.02	<0.02	1.02	3.22
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	0.07	0.02	0.01	4.21	60.3
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.04
EP231B: Perfluoroalkyl Carboxylic Acids								
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	<0.1	<0.1	0.1	0.3
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	<0.02	<0.02	0.20	1.48
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	<0.02	<0.02	0.94	7.80
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	<0.02	<0.02	0.17	1.00
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	<0.01	<0.01	0.52	2.03
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	1.80
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.04
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.04
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.04
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.04
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.09
EP231C: Perfluoroalkyl Sulfonamides								
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.04
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.09
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.09



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	0229_MW232_220824	0229_SW211_220825	0229_SW212_220825	0229_MW123S_22082 5	0229_MW072_220825
Sampling date / time					24-Aug-2022 15:38	25-Aug-2022 07:00	25-Aug-2022 07:00	25-Aug-2022 11:30	25-Aug-2022 13:05
Compound	CAS Number	LOR	Unit	ET2204605-085	ET2204605-088	ET2204605-089	ET2204605-090	ET2204605-091	
				Result	Result	Result	Result	Result	
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05	<0.09
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05	<0.09
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02	<0.04
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02	<0.04
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	<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	0.07
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	<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	<0.05
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L	0.30	0.02	0.09	18.8	126	
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	0.16	0.02	0.05	14.4	97.5	
Sum of PFAS (WA DER List)	----	0.01	µg/L	0.30	0.02	0.09	17.1	116	
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%	88.0	96.0	92.9	96.1	110	
13C8-PFOA	----	0.02	%	90.5	95.7	105	94.6	105	



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	0229_MW139_220825	0229_MW065_220825	0229_MW002_220825	0229_MW106_220825	0229_MW074_220825
				Sampling date / time	25-Aug-2022 13:47	25-Aug-2022 10:50	25-Aug-2022 12:10	25-Aug-2022 12:15	25-Aug-2022 13:24
Compound	CAS Number	LOR	Unit	ET2204605-092	ET2204605-093	ET2204605-094	ET2204605-095	ET2204605-096	
				Result	Result	Result	Result	Result	
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	0.08	0.39	0.07	0.09	5.95	
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	0.10	0.53	0.05	<0.02	6.48	
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	0.96	7.22	0.53	0.16	41.5	
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	0.04	0.42	0.02	<0.02	3.59	
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	1.70	9.83	0.82	0.09	55.0	
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.04	
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	0.1	<0.1	<0.1	0.4	
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	0.25	<0.02	<0.02	1.82	
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	0.07	1.59	0.02	0.03	9.42	
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	0.13	<0.02	<0.02	1.18	
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	0.03	0.24	0.01	<0.01	2.34	
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	1.54	
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.04	
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.04	
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.04	
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.04	
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.09	
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.04	
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.09	
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.09	



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	0229_MW139_220825	0229_MW065_220825	0229_MW002_220825	0229_MW106_220825	0229_MW074_220825
Sampling date / time				25-Aug-2022 13:47	25-Aug-2022 10:50	25-Aug-2022 12:10	25-Aug-2022 12:15	25-Aug-2022 13:24	
Compound	CAS Number	LOR	Unit	ET2204605-092	ET2204605-093	ET2204605-094	ET2204605-095	ET2204605-096	
				Result	Result	Result	Result	Result	
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.09	
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.09	
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.04	
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.04	
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	0.14	
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	2.98	20.7	1.52	0.37	129	
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	2.66	17.0	1.35	0.25	96.5	
Sum of PFAS (WA DER List)	----	0.01	µg/L	2.84	19.8	1.45	0.37	118	
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%	103	99.6	104	103	102	
13C8-PFOA	----	0.02	%	95.6	98.3	98.1	101	102	



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)		Sample ID		0229_MW226_220825	0229_MW018_220825	0229_MW235S_22082 5	0229_MW131_220826	0229_QC306_220826	
Sampling date / time		25-Aug-2022 07:10		25-Aug-2022 14:15		25-Aug-2022 08:50		26-Aug-2022 13:30	
Compound	CAS Number	LOR	Unit	ET2204605-097	ET2204605-098	ET2204605-099	ET2204605-100	ET2204605-101	
				Result	Result	Result	Result	Result	
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	0.13	0.16	0.03	62.0	<0.02	
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	0.06	0.14	<0.02	50.3	<0.02	
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	0.26	0.90	0.01	240	<0.01	
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.07	<0.02	17.3	<0.02	
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	0.04	2.24	<0.01	163	<0.01	
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	<0.02	<0.02	<0.04	<0.02	
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	<0.1	<0.1	5.7	<0.1	
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	0.04	<0.02	18.3	<0.02	
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	0.07	0.24	<0.02	67.2	<0.02	
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	0.04	<0.02	10.9	<0.02	
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	0.07	<0.01	20.7	<0.01	
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	<0.02	<0.02	0.79	<0.02	
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	<0.02	<0.02	<0.04	<0.02	
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	<0.02	<0.02	<0.04	<0.02	
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	<0.02	<0.02	<0.04	<0.02	
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	<0.02	<0.02	<0.04	<0.02	
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	<0.05	<0.05	<0.09	<0.05	
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	<0.02	<0.02	<0.04	<0.02	
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	<0.05	<0.05	<0.09	<0.05	
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	<0.05	<0.05	<0.09	<0.05	



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	0229_MW226_220825	0229_MW018_220825	0229_MW235S_22082 5	0229_MW131_220826	0229_QC306_220826
Sampling date / time				25-Aug-2022 07:10	25-Aug-2022 14:15	25-Aug-2022 08:50	26-Aug-2022 13:30	26-Aug-2022 13:40	
Compound	CAS Number	LOR	Unit	ET2204605-097	ET2204605-098	ET2204605-099	ET2204605-100	ET2204605-101	
				Result	Result	Result	Result	Result	
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	<0.05	<0.05	<0.09	<0.05	
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	<0.05	<0.05	<0.09	<0.05	
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	<0.02	<0.02	<0.04	<0.02	
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	<0.02	<0.02	<0.04	<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	0.18	<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	0.56	3.90	0.04	656	<0.01	
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	0.30	3.14	0.01	403	<0.01	
Sum of PFAS (WA DER List)	----	0.01	µg/L	0.50	3.69	0.04	588	<0.01	
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%	96.9	104	101	120	97.1	
13C8-PFOA	----	0.02	%	97.8	95.2	93.4	100	94.3	



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	0229_SW144_220822	0229_QC304_220825	0229_QC305_220825	----	----
Sampling date / time				22-Aug-2022 13:48	25-Aug-2022 16:00	25-Aug-2022 16:00	----	----	
Compound	CAS Number	LOR	Unit	ET2204605-104	ET2204605-105	ET2204605-106	-----	-----	
				Result	Result	Result	----	----	
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	<0.02	<0.02	----	----	
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	<0.02	<0.02	----	----	
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	0.07	<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	0.05	<0.01	<0.01	----	----	
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	<0.02	<0.02	----	----	
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	<0.1	<0.1	----	----	
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	<0.02	<0.02	----	----	
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	<0.02	<0.02	----	----	
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	<0.02	<0.02	----	----	
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	<0.01	<0.01	----	----	
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	<0.02	<0.02	----	----	
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	<0.02	<0.02	----	----	
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	<0.02	<0.02	----	----	
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	<0.02	<0.02	----	----	
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	<0.02	<0.02	----	----	
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	<0.05	<0.05	----	----	
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	<0.02	<0.02	----	----	
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	<0.05	<0.05	----	----	
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	<0.05	<0.05	----	----	



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	0229_SW144_220822	0229_QC304_220825	0229_QC305_220825	----	----
Sampling date / time				22-Aug-2022 13:48	25-Aug-2022 16:00	25-Aug-2022 16:00	----	----	
Compound	CAS Number	LOR	Unit	ET2204605-104	ET2204605-105	ET2204605-106	-----	-----	
				Result	Result	Result	----	----	
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	<0.05	<0.05	----	----	
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	<0.05	<0.05	----	----	
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	<0.02	<0.02	----	----	
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	<0.02	<0.02	----	----	
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	<0.05	<0.05	----	----	
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	<0.05	<0.05	----	----	
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	<0.05	<0.05	----	----	
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	<0.05	<0.05	----	----	
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L	0.12	<0.01	<0.01	----	----	
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	0.12	<0.01	<0.01	----	----	
Sum of PFAS (WA DER List)	----	0.01	µg/L	0.12	<0.01	<0.01	----	----	
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%	95.7	100	99.9	----	----	
13C8-PFOA	----	0.02	%	93.0	96.6	96.6	----	----	



Surrogate Control Limits

Sub-Matrix: SEDIMENT		Recovery Limits (%)	
Compound	CAS Number	Low	High
EP231S: PFAS Surrogate			
13C4-PFOS	----	68	136
13C8-PFOA	----	69	133

Sub-Matrix: SOIL		Recovery Limits (%)	
Compound	CAS Number	Low	High
EP231S: PFAS Surrogate			
13C4-PFOS	----	68	136
13C8-PFOA	----	69	133

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

Inter-Laboratory Testing

Analysis conducted by ALS Melbourne, NATA accreditation no. 825, site no. 13778 (Chemistry).

- (WATER) EP231P: PFAS Sums
- (WATER) EP231S: PFAS Surrogate
- (SOIL) EP231B: Perfluoroalkyl Carboxylic Acids
- (SOIL) EP231D: (n:2) Fluorotelomer Sulfonic Acids
- (SOIL) EP231C: Perfluoroalkyl Sulfonamides
- (SOIL) EP231A: Perfluoroalkyl Sulfonic Acids
- (SOIL) EP231P: PFAS Sums
- (SOIL) EP231S: PFAS Surrogate
- (SOIL) EA055: Moisture Content (Dried @ 105-110°C)
- (WATER) EP231A: Perfluoroalkyl Sulfonic Acids
- (WATER) EP231B: Perfluoroalkyl Carboxylic Acids
- (WATER) EP231C: Perfluoroalkyl Sulfonamides
- (WATER) EP231D: (n:2) Fluorotelomer Sulfonic Acids

QUALITY CONTROL REPORT

Work Order : ET2204605 Client : ██████████ Contact : ██████████ Address : LEVEL 5 7-13 TOMLINS STREET SOUTH TOWNSVILLE 4810 Telephone : ---- Project : QLD_0229_PFASOMP_20 Order number : 60612487 C-O-C number : 41522 Sampler : ██████████ Site : QLD_0229 Quote number : TV/007/21 v2 - Compass No. of samples received : 107 No. of samples analysed : 107	Page : 1 of 32 Laboratory : Environmental Division Townsville Contact : ██████████ Address : 13 Carlton Street, Kirwan Townsville QLD Australia 4815 Telephone : ██████████ Date Samples Received : 30-Aug-2022 Date Analysis Commenced : 05-Sep-2022 Issue Date : 16-Sep-2022
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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
██████████	Non-Metals Team Leader Senior Organic Chemist	Melbourne Inorganics, Springvale, VIC Melbourne Organics, Springvale, VIC



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: 4560692)									
ET2204605-001	0229_SD136_220823	EA055: Moisture Content	----	0.1	%	32.1	31.9	0.7	0% - 20%
ET2204605-019	0229_SD113_220822	EA055: Moisture Content	----	0.1	%	14.8	15.0	1.7	0% - 20%
EA055: Moisture Content (Dried @ 105-110°C) (QC Lot: 4560693)									
ET2204605-035	0229_SD203_220822	EA055: Moisture Content	----	0.1	%	25.5	24.7	3.3	0% - 20%
ET2204605-087	0229_SD212_220825	EA055: Moisture Content	----	0.1	%	27.9	26.0	7.1	0% - 20%
EA055: Moisture Content (Dried @ 105-110°C) (QC Lot: 4575081)									
ET2204605-107	0229_SD144_220822	EA055: Moisture Content	----	0.1	%	29.8	32.9	10.1	0% - 20%
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 4565757)									
ET2204605-001	0229_SD136_220823	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	0.0008	0.0008	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	0.0075	0.0080	6.6	0% - 20%
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
ET2204605-019	0229_SD113_220822	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	0.0004	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
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 4566844)									
ET2204605-035	0229_SD203_220822	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



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: 4566844) - continued											
ET2204605-035	0229_SD203_220822	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	0.0006	22.3	No Limit		
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit		
ET2204605-087	0229_SD212_220825	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	0.0002	40.2	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: 4576844)											
EM2216846-055	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		
EM2217716-001	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: 4565757)											
ET2204605-001	0229_SD136_220823	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		
		ET2204605-019	0229_SD113_220822	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		



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: 4565757) - continued											
ET2204605-019	0229_SD113_220822	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: 4566844)											
ET2204605-035	0229_SD203_220822	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		
ET2204605-087	0229_SD212_220825	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: 4576844)									
		EM2216846-055	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		



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: 4576844) - continued									
EM2216846-055	Anonymous	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	<0.001	0.0	No Limit
EM2217716-001	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: 4565757)									
ET2204605-001	0229_SD136_220823	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
ET2204605-019	0229_SD113_220822	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
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 4566844)									
ET2204605-035	0229_SD203_220822	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	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 (%)
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 4566844) - continued									
ET2204605-035	0229_SD203_220822	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
ET2204605-087	0229_SD212_220825	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
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 4576844)									
EM2216846-055	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
EM2217716-001	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	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 (%)
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 4576844) - continued									
EM2217716-001	Anonymous	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: 4565757)									
ET2204605-001	0229_SD136_220823	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
ET2204605-019	0229_SD113_220822	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: 4566844)									
ET2204605-035	0229_SD203_220822	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
ET2204605-087	0229_SD212_220825	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: 4566844) - continued									
ET2204605-087	0229_SD212_220825	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: 4576844)									
EM2216846-055	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
EM2217716-001	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: 4565757)									
ET2204605-001	0229_SD136_220823	EP231X: Sum of PFAS	----	0.0002	mg/kg	0.0083	0.0090	8.1	0% - 20%
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg	0.0083	0.0088	5.8	0% - 20%
		EP231X: Sum of PFAS (WA DER List)	----	0.0002	mg/kg	0.0083	0.0090	8.1	0% - 20%
ET2204605-019	0229_SD113_220822	EP231X: Sum of PFAS	----	0.0002	mg/kg	0.0004	0.0003	28.6	No Limit
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg	0.0004	0.0003	28.6	No Limit
		EP231X: Sum of PFAS (WA DER List)	----	0.0002	mg/kg	0.0004	0.0003	28.6	No Limit
EP231P: PFAS Sums (QC Lot: 4566844)									
ET2204605-035	0229_SD203_220822	EP231X: Sum of PFAS	----	0.0002	mg/kg	0.0005	0.0006	18.2	No Limit
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg	0.0005	0.0006	18.2	No Limit
		EP231X: Sum of PFAS (WA DER List)	----	0.0002	mg/kg	0.0005	0.0006	18.2	No Limit
ET2204605-087	0229_SD212_220825	EP231X: Sum of PFAS	----	0.0002	mg/kg	0.0003	0.0002	40.0	No Limit
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg	0.0003	0.0002	40.0	No Limit
		EP231X: Sum of PFAS (WA DER List)	----	0.0002	mg/kg	0.0003	0.0002	40.0	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: 4576844)									
EM2216846-055	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
EM2217716-001	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

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: 4571350)									
ET2204605-044	0229_SW243_220822	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	0.02	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
ET2204605-051	0229_SW220_220822	EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	1.34	1.33	0.9	0% - 20%
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	0.74	0.76	2.5	0% - 20%
		EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	0.17	0.18	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	0.05	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: 4577251)									
ET2204605-052	0229_SW203_220822	EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	0.19	0.21	8.5	0% - 20%
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	0.21	0.22	4.7	0% - 20%
		EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	0.06	0.05	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
ET2204605-057	0229_MW123I_220824	EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	0.75	0.65	14.6	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	0.22	0.18	21.8	0% - 50%
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	0.20	0.16	24.4	0% - 50%
		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: 4578307)									
ET2204605-058	0229_MW105_220824	EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	35.4	36.1	2.0	0% - 20%
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	25.3	24.4	3.9	0% - 20%
		EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	4.16	3.98	4.5	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: 4578307) - continued											
ET2204605-058	0229_MW105_220824	EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	5.94	5.35	10.4	0% - 20%		
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	1.95	1.71	13.0	0% - 20%		
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit		
ET2204605-074	0229_MW115_220824	EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	0.16	0.17	0.0	0% - 50%		
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	0.10	0.10	0.0	0% - 50%		
		EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	0.10	0.10	0.0	No Limit		
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	0.04	0.04	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: 4578309)									
ET2204605-076	0229_MW118_220824	EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	0.03	0.03	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	0.05	0.05	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: 4571350)											
ET2204605-044	0229_SW243_220822	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		
		ET2204605-051	0229_SW220_220822	EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	0.04	0.04	0.0	No Limit
				EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	0.04	0.04	0.0	No Limit
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4			0.02	µg/L	0.22	0.24	5.7	0% - 50%		
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	0.04	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	<0.1	<0.1	0.0	No Limit		
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 4577251)											



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: 4577251) - continued									
ET2204605-052	0229_SW203_220822	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
ET2204605-057	0229_MW123I_220824	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	0.11	0.09	21.7	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: 4578307)									
ET2204605-058	0229_MW105_220824	EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	1.65	1.52	8.2	0% - 20%
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	1.47	1.39	5.5	0% - 20%
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	8.50	8.20	3.5	0% - 20%
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	1.05	1.04	0.0	0% - 20%
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	0.11	0.12	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	0.4	0.4	0.0	No Limit
ET2204605-074	0229_MW115_220824	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	0.07	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



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: 4578307) - continued									
ET2204605-074	0229_MW115_220824	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: 4578309)									
ET2204605-076	0229_MW118_220824	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: 4571350)									
ET2204605-044	0229_SW243_220822	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
ET2204605-051	0229_SW220_220822	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: 4571350) - continued									
ET2204605-051	0229_SW220_220822	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: 4577251)									
ET2204605-052	0229_SW203_220822	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
ET2204605-057	0229_MW123I_220824	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: 4578307)									
ET2204605-058	0229_MW105_220824	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: 4578307) - continued									
ET2204605-058	0229_MW105_220824	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
ET2204605-074	0229_MW115_220824	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: 4578309)									
ET2204605-076	0229_MW118_220824	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: 4571350)									
ET2204605-044	0229_SW243_220822	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: 4571350) - continued									
ET2204605-051	0229_SW220_220822	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: 4577251)									
ET2204605-052	0229_SW203_220822	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
ET2204605-057	0229_MW123I_220824	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: 4578307)									
ET2204605-058	0229_MW105_220824	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	0.20	0.21	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	0.06	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
ET2204605-074	0229_MW115_220824	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: 4578307) - continued									
ET2204605-074	0229_MW115_220824	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: 4578309)									
ET2204605-076	0229_MW118_220824	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: 4571350)									
ET2204605-044	0229_SW243_220822	EP231X: Sum of PFAS	----	0.01	µg/L	0.03	0.03	0.0	No Limit
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	0.03	0.03	0.0	No Limit
		EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	0.03	0.03	0.0	No Limit
ET2204605-051	0229_SW220_220822	EP231X: Sum of PFAS	----	0.01	µg/L	2.80	2.84	1.4	0% - 20%
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	2.08	2.09	0.5	0% - 20%
		EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	2.57	2.61	1.5	0% - 20%
EP231P: PFAS Sums (QC Lot: 4577251)									
ET2204605-052	0229_SW203_220822	EP231X: Sum of PFAS	----	0.01	µg/L	0.51	0.52	1.9	0% - 20%
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	0.40	0.43	7.2	0% - 20%
		EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	0.48	0.50	4.1	0% - 20%
ET2204605-057	0229_MW123I_220824	EP231X: Sum of PFAS	----	0.01	µg/L	1.28	1.08	16.9	0% - 20%
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	0.75	0.65	14.3	0% - 20%
		EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	1.08	0.92	16.0	0% - 20%
EP231P: PFAS Sums (QC Lot: 4578307)									
ET2204605-058	0229_MW105_220824	EP231X: Sum of PFAS	----	0.01	µg/L	86.1	84.5	1.9	0% - 20%
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	60.7	60.5	0.3	0% - 20%
		EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	78.1	77.3	1.1	0% - 20%
ET2204605-074	0229_MW115_220824	EP231X: Sum of PFAS	----	0.01	µg/L	0.47	0.48	2.1	0% - 20%
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	0.26	0.27	3.8	0% - 20%
		EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	0.43	0.44	2.3	0% - 20%
EP231P: PFAS Sums (QC Lot: 4578309)									
ET2204605-076	0229_MW118_220824	EP231X: Sum of PFAS	----	0.01	µg/L	0.08	0.08	0.0	No Limit

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 Work Order : ET2204605
 Client : XXXXXXXXXX
 Project : QLD_0229_PFASOMP_20



Sub-Matrix: **WATER**

				<i>Laboratory Duplicate (DUP) Report</i>					
<i>Laboratory sample ID</i>	<i>Sample ID</i>	<i>Method: Compound</i>	<i>CAS Number</i>	<i>LOR</i>	<i>Unit</i>	<i>Original Result</i>	<i>Duplicate Result</i>	<i>RPD (%)</i>	<i>Acceptable RPD (%)</i>
EP231P: PFAS Sums (QC Lot: 4578309) - continued									
ET2204605-076	0229_MW118_220824	EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	0.03	0.03	0.0	No Limit
		EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	0.08	0.08	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: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report				
				Result	Spike Concentration	Spike Recovery (%)		Acceptable Limits (%)	
						LCS	Low	High	
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4565757)									
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	0.00125 mg/kg	81.5	72.0	128	
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	0.00125 mg/kg	76.4	73.0	123	
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	0.00125 mg/kg	78.3	67.0	130	
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	89.4	70.0	132	
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	84.8	68.0	136	
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	0.00125 mg/kg	86.7	59.0	134	
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4566844)									
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	0.00125 mg/kg	90.0	72.0	128	
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	0.00125 mg/kg	83.0	73.0	123	
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	0.00125 mg/kg	80.6	67.0	130	
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	92.1	70.0	132	
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	84.0	68.0	136	
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	0.00125 mg/kg	87.8	59.0	134	
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4576844)									
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	0.00125 mg/kg	81.4	72.0	128	
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	0.00125 mg/kg	84.0	73.0	123	
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	0.00125 mg/kg	84.8	67.0	130	
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	85.7	70.0	132	
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	88.1	68.0	136	
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	0.00125 mg/kg	77.0	59.0	134	
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4565757)									
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	0.00625 mg/kg	95.9	71.0	135	
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	0.00125 mg/kg	97.7	69.0	132	
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	0.00125 mg/kg	82.0	70.0	132	
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	0.00125 mg/kg	82.5	71.0	131	
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	83.8	69.0	133	
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	94.4	72.0	129	
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	0.00125 mg/kg	76.0	69.0	133	
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	94.8	64.0	136	
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	107	69.0	135	
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	103	66.0	139	
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	0.00312 mg/kg	82.2	69.0	133	
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4566844)									
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	0.00625 mg/kg	98.4	71.0	135	



Sub-Matrix: SOIL

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report				
				Result	Spike	Spike Recovery (%)		Acceptable Limits (%)	
					Concentration	LCS	Low	High	
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4566844) - continued									
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	0.00125 mg/kg	99.2	69.0	132	
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	0.00125 mg/kg	82.9	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	91.4	69.0	133	
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	85.6	72.0	129	
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	0.00125 mg/kg	85.6	69.0	133	
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	86.1	64.0	136	
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	88.9	69.0	135	
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	80.6	66.0	139	
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	0.00312 mg/kg	96.8	69.0	133	
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4576844)									
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	83.8	69.0	132	
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	0.00125 mg/kg	87.4	70.0	132	
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	0.00125 mg/kg	83.8	71.0	131	
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	86.0	69.0	133	
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	96.1	72.0	129	
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	0.00125 mg/kg	86.0	69.0	133	
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	83.5	64.0	136	
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	84.6	69.0	135	
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	84.4	66.0	139	
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	0.00312 mg/kg	98.8	69.0	133	
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4565757)									
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	0.00125 mg/kg	83.1	67.0	137	
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	0.00312 mg/kg	90.4	70.0	130	
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	0.00312 mg/kg	96.5	70.0	130	
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	0.00312 mg/kg	104	70.0	130	
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	0.00312 mg/kg	83.2	70.0	130	
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	0.00125 mg/kg	66.7	63.0	144	
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	0.00125 mg/kg	72.2	61.0	139	
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4566844)									
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	0.00125 mg/kg	85.9	67.0	137	
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	0.00312 mg/kg	109	70.0	130	
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	0.00312 mg/kg	93.9	70.0	130	



Sub-Matrix: SOIL

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report				
				Result	Spike	Spike Recovery (%)		Acceptable Limits (%)	
					Concentration	LCS	Low	High	
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4566844) - continued									
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	0.00312 mg/kg	80.2	70.0	130	
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	0.00312 mg/kg	107	70.0	130	
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	93.1	61.0	139	
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4576844)									
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	0.00125 mg/kg	80.5	67.0	137	
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	0.00312 mg/kg	88.1	70.0	130	
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	0.00312 mg/kg	85.2	70.0	130	
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	0.00312 mg/kg	86.3	70.0	130	
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	0.00312 mg/kg	91.0	70.0	130	
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	0.00125 mg/kg	86.0	63.0	144	
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	0.00125 mg/kg	82.5	61.0	139	
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4565757)									
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	0.00125 mg/kg	83.3	62.0	145	
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	0.00125 mg/kg	85.5	64.0	140	
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	0.00125 mg/kg	91.0	65.0	137	
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	0.00125 mg/kg	102	70.0	130	
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4566844)									
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	0.00125 mg/kg	92.0	62.0	145	
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	0.00125 mg/kg	93.7	64.0	140	
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	0.00125 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	0.00125 mg/kg	93.2	70.0	130	
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4576844)									
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	0.00125 mg/kg	80.2	62.0	145	
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	0.00125 mg/kg	83.1	64.0	140	
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	0.00125 mg/kg	88.0	65.0	137	
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	0.00125 mg/kg	82.3	70.0	130	
EP231P: PFAS Sums (QCLot: 4565757)									
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	----	----	----	----	



Sub-Matrix: **SOIL**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report Result	Laboratory Control Spike (LCS) Report				
					Spike Concentration	Spike Recovery (%)		Acceptable Limits (%)	
						LCS	Low	High	High
EP231P: PFAS Sums (QCLot: 4565757) - continued									
EP231X: Sum of PFAS (WA DER List)	----	0.0002	mg/kg	<0.0002	----	----	----	----	
EP231P: PFAS Sums (QCLot: 4566844)									
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: 4576844)									
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	----	----	----	----	

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report Result	Laboratory Control Spike (LCS) Report				
					Spike Concentration	Spike Recovery (%)		Acceptable Limits (%)	
						LCS	Low	High	High
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4571350)									
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.25 µg/L	85.2	72.0	130	
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.25 µg/L	80.6	71.0	127	
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	0.25 µg/L	80.5	68.0	131	
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.25 µg/L	97.3	69.0	134	
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.25 µg/L	82.3	65.0	140	
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.25 µg/L	83.3	53.0	142	
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4577251)									
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.25 µg/L	85.5	72.0	130	
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.25 µg/L	86.0	71.0	127	
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	0.25 µg/L	81.9	68.0	131	
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.25 µg/L	88.1	69.0	134	
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.25 µg/L	93.6	65.0	140	
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.25 µg/L	91.1	53.0	142	
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4578307)									
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.25 µg/L	82.9	72.0	130	
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.25 µg/L	94.7	71.0	127	
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	0.25 µg/L	85.4	68.0	131	
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.25 µg/L	91.3	69.0	134	
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.25 µg/L	81.5	65.0	140	
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.25 µg/L	82.7	53.0	142	
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4578309)									
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.25 µg/L	86.3	72.0	130	
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.25 µg/L	95.1	71.0	127	



Sub-Matrix: WATER

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report Result	Laboratory Control Spike (LCS) Report				
					Spike Concentration	Spike Recovery (%)		Acceptable Limits (%)	
						LCS	Low	High	High
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4578309) - continued									
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	0.25 µg/L	88.4	68.0	131	
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.25 µg/L	94.1	69.0	134	
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.25 µg/L	82.4	65.0	140	
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.25 µg/L	86.2	53.0	142	
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4571350)									
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	1.25 µg/L	92.2	73.0	129	
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	0.25 µg/L	88.1	72.0	129	
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	0.25 µg/L	94.1	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	91.2	71.0	133	
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	0.25 µg/L	99.5	69.0	130	
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	0.25 µg/L	90.9	71.0	129	
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	0.25 µg/L	94.1	69.0	133	
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	0.25 µg/L	89.5	72.0	134	
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	0.25 µg/L	84.2	65.0	144	
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	0.625 µg/L	109	71.0	132	
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4577251)									
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	1.25 µg/L	92.3	73.0	129	
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	0.25 µg/L	95.4	72.0	129	
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	0.25 µg/L	90.8	72.0	129	
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	0.25 µg/L	90.6	72.0	130	
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	0.25 µg/L	91.2	71.0	133	
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	0.25 µg/L	92.3	69.0	130	
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	0.25 µg/L	93.2	71.0	129	
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	0.25 µg/L	92.1	69.0	133	
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	0.25 µg/L	93.7	72.0	134	
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	0.25 µg/L	83.8	65.0	144	
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	0.625 µg/L	105	71.0	132	
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4578307)									
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	1.25 µg/L	86.9	73.0	129	
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	0.25 µg/L	90.8	72.0	129	
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	0.25 µg/L	94.2	72.0	129	
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	0.25 µg/L	93.9	72.0	130	
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	0.25 µg/L	90.2	71.0	133	
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	0.25 µg/L	93.0	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	96.2	69.0	133	
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	0.25 µg/L	88.7	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 (%)		Acceptable Limits (%)	
						LCS	Low	High	High
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4578307) - continued									
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	0.25 µg/L	87.7	65.0	144	
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	0.625 µg/L	100	71.0	132	
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4578309)									
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	1.25 µg/L	92.6	73.0	129	
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	0.25 µg/L	94.7	72.0	129	
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	0.25 µg/L	93.7	72.0	129	
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	0.25 µg/L	93.9	72.0	130	
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	0.25 µg/L	92.0	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	95.3	71.0	129	
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	0.25 µg/L	88.0	69.0	133	
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	0.25 µg/L	94.8	72.0	134	
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	0.25 µg/L	83.5	65.0	144	
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	0.625 µg/L	118	71.0	132	
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4571350)									
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.25 µg/L	93.1	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	102	70.0	130	
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	0.625 µg/L	93.7	70.0	130	
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	0.625 µg/L	84.9	70.0	130	
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	0.25 µg/L	94.0	65.0	136	
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	0.25 µg/L	91.5	61.0	135	
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4577251)									
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.25 µg/L	89.2	67.0	137	
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	0.625 µg/L	95.8	68.0	141	
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	0.625 µg/L	109	70.0	130	
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	0.625 µg/L	96.4	70.0	130	
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	0.625 µg/L	98.0	70.0	130	
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	75.6	61.0	135	
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4578307)									



Sub-Matrix: WATER

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report				
				Result	Spike	Spike Recovery (%)		Acceptable Limits (%)	
					Concentration	LCS	Low	High	
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4578307) - continued									
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.25 µg/L	102	67.0	137	
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	0.625 µg/L	121	68.0	141	
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	0.625 µg/L	113	70.0	130	
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	0.625 µg/L	105	70.0	130	
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	0.625 µg/L	99.2	70.0	130	
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	0.25 µg/L	92.0	65.0	136	
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	0.25 µg/L	94.6	61.0	135	
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4578309)									
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.25 µg/L	88.8	67.0	137	
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	0.625 µg/L	119	68.0	141	
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	0.625 µg/L	106	70.0	130	
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	0.625 µg/L	104	70.0	130	
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	0.625 µg/L	96.9	70.0	130	
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	0.25 µg/L	94.1	65.0	136	
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	0.25 µg/L	85.1	61.0	135	
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4571350)									
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.25 µg/L	91.9	63.0	143	
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	0.25 µg/L	94.2	64.0	140	
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	0.25 µg/L	101	67.0	138	
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	0.25 µg/L	80.9	70.0	130	
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4577251)									
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.25 µg/L	93.4	63.0	143	
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	0.25 µg/L	82.2	64.0	140	
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	0.25 µg/L	106	67.0	138	
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	0.25 µg/L	82.8	70.0	130	
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4578307)									
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.25 µg/L	93.5	63.0	143	
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	0.25 µg/L	102	64.0	140	
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	0.25 µg/L	89.2	67.0	138	
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	0.25 µg/L	76.6	70.0	130	
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4578309)									



Sub-Matrix: WATER

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report Result	Laboratory Control Spike (LCS) Report			
					Spike Concentration	Spike Recovery (%)	Acceptable Limits (%)	
						LCS	Low	High
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4578309) - continued								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.25 µg/L	93.6	63.0	143
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	0.25 µg/L	100	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	0.25 µg/L	97.1	67.0	138
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	0.25 µg/L	75.0	70.0	130
EP231P: PFAS Sums (QCLot: 4571350)								
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: 4577251)								
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: 4578307)								
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: 4578309)								
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: SOIL

Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report			
				Spike Concentration	Spike Recovery(%)	Acceptable Limits (%)	
					MS	Low	High
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4565757)							
ET2204605-002	0229_SD133_220823	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.00125 mg/kg	75.4	72.0	128
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.00125 mg/kg	78.2	73.0	123
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.00125 mg/kg	80.6	67.0	130
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.00125 mg/kg	88.4	70.0	132
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.00125 mg/kg	# 46.5	68.0	136



Sub-Matrix: SOIL

				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: 4565757) - continued							
ET2204605-002	0229_SD133_220823	EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.00125 mg/kg	70.2	59.0	134
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4566844)							
ET2204605-036	0229_SD220_220822	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.00125 mg/kg	77.9	72.0	128
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.00125 mg/kg	96.4	73.0	123
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.00125 mg/kg	83.8	67.0	130
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.00125 mg/kg	78.4	70.0	132
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.00125 mg/kg	# Not Determined	68.0	136
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.00125 mg/kg	67.9	59.0	134
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4576844)							
EM2217358-001	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.00125 mg/kg	79.9	72.0	128
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.00125 mg/kg	77.9	73.0	123
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.00125 mg/kg	73.5	67.0	130
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.00125 mg/kg	92.2	70.0	132
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.00125 mg/kg	80.9	68.0	136
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.00125 mg/kg	80.1	59.0	134
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4565757)							
ET2204605-002	0229_SD133_220823	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	98.4	69.0	132
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.00125 mg/kg	# 60.9	70.0	132
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.00125 mg/kg	82.4	71.0	131
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.00125 mg/kg	78.2	69.0	133
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.00125 mg/kg	88.6	72.0	129
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.00125 mg/kg	# 63.3	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	90.5	69.0	135
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.00125 mg/kg	87.4	66.0	139
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.00312 mg/kg	87.6	69.0	133
		EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4566844)					
ET2204605-036	0229_SD220_220822	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.00625 mg/kg	85.0	71.0	135
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.00125 mg/kg	92.6	69.0	132
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.00125 mg/kg	81.7	70.0	132
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.00125 mg/kg	85.7	71.0	131
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.00125 mg/kg	86.2	69.0	133
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.00125 mg/kg	84.0	72.0	129
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.00125 mg/kg	95.9	69.0	133
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.00125 mg/kg	84.6	64.0	136
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.00125 mg/kg	105	69.0	135



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: 4566844) - continued							
ET2204605-036	0229_SD220_220822	EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.00125 mg/kg	117	66.0	139
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.00312 mg/kg	102	69.0	133
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4576844)							
EM2217358-001	Anonymous	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.00625 mg/kg	86.9	71.0	135
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.00125 mg/kg	83.4	69.0	132
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.00125 mg/kg	85.8	70.0	132
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.00125 mg/kg	88.2	71.0	131
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.00125 mg/kg	90.1	69.0	133
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.00125 mg/kg	96.0	72.0	129
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.00125 mg/kg	81.1	69.0	133
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.00125 mg/kg	87.3	64.0	136
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.00125 mg/kg	89.9	69.0	135
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.00125 mg/kg	79.3	66.0	139
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.00312 mg/kg	103	69.0	133
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4565757)							
ET2204605-002	0229_SD133_220823	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.00125 mg/kg	73.4	67.0	137
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.00312 mg/kg	76.4	70.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.00312 mg/kg	72.5	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.00312 mg/kg	88.6	70.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.00312 mg/kg	# 57.8	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.00125 mg/kg	64.8	63.0	144
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.00125 mg/kg	62.0	61.0	139
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4566844)							
ET2204605-036	0229_SD220_220822	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.00125 mg/kg	79.3	67.0	137
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.00312 mg/kg	105	70.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.00312 mg/kg	91.2	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.00312 mg/kg	103	70.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.00312 mg/kg	94.2	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.00125 mg/kg	118	63.0	144



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: 4566844) - continued							
ET2204605-036	0229_SD220_220822	EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.00125 mg/kg	98.9	61.0	139
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4576844)							
EM2217358-001	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.00125 mg/kg	87.5	67.0	137
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.00312 mg/kg	100	70.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.00312 mg/kg	90.0	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.00312 mg/kg	84.0	70.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.00312 mg/kg	93.1	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.00125 mg/kg	89.8	63.0	144
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.00125 mg/kg	87.7	61.0	139
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4565757)							
ET2204605-002	0229_SD133_220823	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.00125 mg/kg	65.8	62.0	145
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.00125 mg/kg	76.6	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.00125 mg/kg	99.8	65.0	137
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.00125 mg/kg	# 67.0	70.0	130
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4566844)							
ET2204605-036	0229_SD220_220822	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.00125 mg/kg	74.9	62.0	145
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.00125 mg/kg	80.6	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.00125 mg/kg	94.6	65.0	137
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.00125 mg/kg	83.1	70.0	130
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4576844)							
EM2217358-001	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.00125 mg/kg	81.0	62.0	145
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.00125 mg/kg	87.2	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.00125 mg/kg	92.4	65.0	137
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.00125 mg/kg	76.2	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
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4571350)							
ET2204605-050	0229_SW232_220822	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.25 µg/L	# 39.0	72.0	130
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.25 µg/L	78.5	71.0	127
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.25 µg/L	# 29.5	68.0	131



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: 4571350) - continued							
ET2204605-050	0229_SW232_220822	EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.25 µg/L	99.0	69.0	134
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.25 µg/L	# 36.7	65.0	140
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.25 µg/L	84.3	53.0	142
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4577251)							
ET2204605-054	0229_MW125S_220824	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.25 µg/L	86.7	72.0	130
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.25 µg/L	77.1	71.0	127
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.25 µg/L	71.4	68.0	131
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.25 µg/L	79.0	69.0	134
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.25 µg/L	91.4	65.0	140
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.25 µg/L	84.8	53.0	142
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4578307)							
ET2204605-069	0229_MW122_220824	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.25 µg/L	84.8	72.0	130
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.25 µg/L	84.4	71.0	127
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.25 µg/L	# Not Determined	68.0	131
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.25 µg/L	85.0	69.0	134
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.25 µg/L	# Not Determined	65.0	140
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.25 µg/L	94.3	53.0	142
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4578309)							
ET2204605-082	0229_MW138_220824	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.25 µg/L	# Not Determined	72.0	130
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.25 µg/L	# Not Determined	71.0	127
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.25 µg/L	# Not Determined	68.0	131
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.25 µg/L	89.0	69.0	134
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.25 µg/L	# Not Determined	65.0	140
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.25 µg/L	96.8	53.0	142
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4571350)							
ET2204605-050	0229_SW232_220822	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	1.25 µg/L	74.0	73.0	129
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.25 µg/L	81.8	72.0	129
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.25 µg/L	92.1	72.0	129
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.25 µg/L	89.2	72.0	130
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.25 µg/L	89.6	71.0	133
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.25 µg/L	96.6	69.0	130
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.25 µg/L	87.9	71.0	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: 4571350) - continued									
ET2204605-050	0229_SW232_220822	EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.25 µg/L	87.8	69.0	133		
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.25 µg/L	81.0	72.0	134		
		EP231X: Perfluorotridecanoic acid (PFTTrDA)	72629-94-8	0.25 µg/L	70.0	65.0	144		
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.625 µg/L	96.8	71.0	132		
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4577251)									
ET2204605-054	0229_MW125S_220824	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	1.25 µg/L	76.4	73.0	129		
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.25 µg/L	96.9	72.0	129		
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.25 µg/L	85.1	72.0	129		
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.25 µg/L	90.5	72.0	130		
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.25 µg/L	92.2	71.0	133		
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.25 µg/L	95.9	69.0	130		
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.25 µg/L	97.5	71.0	129		
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.25 µg/L	93.8	69.0	133		
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.25 µg/L	103	72.0	134		
		EP231X: Perfluorotridecanoic acid (PFTTrDA)	72629-94-8	0.25 µg/L	89.7	65.0	144		
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.625 µg/L	93.2	71.0	132		
		EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4578307)							
ET2204605-069	0229_MW122_220824	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	1.25 µg/L	# 69.2	73.0	129		
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.25 µg/L	84.1	72.0	129		
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.25 µg/L	82.1	72.0	129		
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.25 µg/L	92.0	72.0	130		
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.25 µg/L	82.2	71.0	133		
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.25 µg/L	92.8	69.0	130		
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.25 µg/L	95.3	71.0	129		
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.25 µg/L	90.5	69.0	133		
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.25 µg/L	87.2	72.0	134		
		EP231X: Perfluorotridecanoic acid (PFTTrDA)	72629-94-8	0.25 µg/L	84.8	65.0	144		
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.625 µg/L	91.8	71.0	132		
		EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4578309)							
		ET2204605-082	0229_MW138_220824	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	1.25 µg/L	# 52.1	73.0	129
				EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.25 µg/L	79.9	72.0	129
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4			0.25 µg/L	# Not Determined	72.0	129		
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9			0.25 µg/L	85.1	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	84.9	69.0	130		
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2			0.25 µg/L	82.9	71.0	129		
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8			0.25 µg/L	85.9	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: 4578309) - continued							
ET2204605-082	0229_MW138_220824	EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.25 µg/L	99.5	72.0	134
		EP231X: Perfluorotridecanoic acid (PFTTrDA)	72629-94-8	0.25 µg/L	82.5	65.0	144
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.625 µg/L	106	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4571350)							
ET2204605-050	0229_SW232_220822	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.25 µg/L	89.2	67.0	137
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.625 µg/L	92.8	68.0	141
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.625 µg/L	75.1	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.625 µg/L	83.1	70.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.625 µg/L	79.3	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.25 µg/L	78.4	65.0	136
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.25 µg/L	82.5	61.0	135
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4577251)							
ET2204605-054	0229_MW125S_220824	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.25 µg/L	85.3	67.0	137
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.625 µg/L	84.5	68.0	141
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.625 µg/L	85.5	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.625 µg/L	96.8	70.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.625 µg/L	94.2	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.25 µg/L	90.6	65.0	136
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.25 µg/L	81.3	61.0	135
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4578307)							
ET2204605-069	0229_MW122_220824	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.25 µg/L	86.9	67.0	137
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.625 µg/L	80.3	68.0	141
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.625 µg/L	75.0	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.625 µg/L	90.7	70.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.625 µg/L	88.9	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: 4578307) - continued							
ET2204605-069	0229_MW122_220824	EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.25 µg/L	90.6	65.0	136
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.25 µg/L	79.9	61.0	135
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4578309)							
ET2204605-082	0229_MW138_220824	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.25 µg/L	91.0	67.0	137
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.625 µg/L	78.9	68.0	141
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.625 µg/L	83.7	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	94.7	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.25 µg/L	87.6	65.0	136
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.25 µg/L	83.2	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4571350)							
ET2204605-050	0229_SW232_220822	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.25 µg/L	92.1	63.0	143
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.25 µg/L	91.4	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.25 µg/L	94.8	67.0	138
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.25 µg/L	71.2	70.0	130
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4577251)							
ET2204605-054	0229_MW125S_220824	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.25 µg/L	94.8	63.0	143
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.25 µg/L	88.8	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.25 µg/L	88.0	67.0	138
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.25 µg/L	108	70.0	130
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4578307)							
ET2204605-069	0229_MW122_220824	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.25 µg/L	98.0	63.0	143
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.25 µg/L	102	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.25 µg/L	100	67.0	138
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.25 µg/L	110	70.0	130
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4578309)							
ET2204605-082	0229_MW138_220824	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.25 µg/L	97.3	63.0	143
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.25 µg/L	97.8	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.25 µg/L	91.7	67.0	138
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.25 µg/L	85.8	70.0	130

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: ET2204605	Page	: 1 of 21
Client	: [REDACTED]	Laboratory	: Environmental Division Townsville
Contact	: [REDACTED]	Telephone	: [REDACTED]
Project	: QLD_0229_PFASOMP_20	Date Samples Received	: 30-Aug-2022
Site	: QLD_0229	Issue Date	: 16-Sep-2022
Sampler	: [REDACTED]	No. of samples received	: 107
Order number	: 60612487	No. of samples analysed	: 107

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

- 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: **SOIL**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
Matrix Spike (MS) Recoveries							
EP231A: Perfluoroalkyl Sulfonic Acids	ET2204605--002	0229_SD133_220823	Perfluorooctane sulfonic acid (PFOS)	1763-23-1	46.5 %	68.0-136%	Recovery less than lower data quality objective
EP231A: Perfluoroalkyl Sulfonic Acids	ET2204605--036	0229_SD220_220822	Perfluorooctane sulfonic acid (PFOS)	1763-23-1	Not Determined	----	MS recovery not determined, background level greater than or equal to 4x spike level.
EP231B: Perfluoroalkyl Carboxylic Acids	ET2204605--002	0229_SD133_220823	Perfluorohexanoic acid (PFHxA)	307-24-4	60.9 %	70.0-132%	Recovery less than lower data quality objective
EP231B: Perfluoroalkyl Carboxylic Acids	ET2204605--002	0229_SD133_220823	Perfluorodecanoic acid (PFDA)	335-76-2	63.3 %	69.0-133%	Recovery less than lower data quality objective
EP231C: Perfluoroalkyl Sulfonamides	ET2204605--002	0229_SD133_220823	N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	57.8 %	70.0-130%	Recovery less than lower data quality objective
EP231D: (n:2) Fluorotelomer Sulfonic Acids	ET2204605--002	0229_SD133_220823	10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	67.0 %	70.0-130%	Recovery less than lower data quality objective

Matrix: **WATER**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
Matrix Spike (MS) Recoveries							
EP231A: Perfluoroalkyl Sulfonic Acids	ET2204605--050	0229_SW232_220822	Perfluorobutane sulfonic acid (PFBS)	375-73-5	39.0 %	72.0-130%	Recovery less than lower data quality objective
EP231A: Perfluoroalkyl Sulfonic Acids	ET2204605--082	0229_MW138_220824	Perfluorobutane sulfonic acid (PFBS)	375-73-5	Not Determined	----	MS recovery not determined, background level greater than or equal to 4x spike level.
EP231A: Perfluoroalkyl Sulfonic Acids	ET2204605--082	0229_MW138_220824	Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	Not Determined	----	MS recovery not determined, background level greater than or equal to 4x spike level.
EP231A: Perfluoroalkyl Sulfonic Acids	ET2204605--050	0229_SW232_220822	Perfluorohexane sulfonic acid (PFHxS)	355-46-4	29.5 %	68.0-131%	Recovery less than lower data quality objective
EP231A: Perfluoroalkyl Sulfonic Acids	ET2204605--069	0229_MW122_220824	Perfluorohexane sulfonic acid (PFHxS)	355-46-4	Not Determined	----	MS recovery not determined, background level greater than or equal to 4x spike level.
EP231A: Perfluoroalkyl Sulfonic Acids	ET2204605--082	0229_MW138_220824	Perfluorohexane sulfonic acid (PFHxS)	355-46-4	Not Determined	----	MS recovery not determined, background level greater than or equal to 4x spike level.
EP231A: Perfluoroalkyl Sulfonic Acids	ET2204605--050	0229_SW232_220822	Perfluorooctane sulfonic acid (PFOS)	1763-23-1	36.7 %	65.0-140%	Recovery less than lower data quality objective
EP231A: Perfluoroalkyl Sulfonic Acids	ET2204605--069	0229_MW122_220824	Perfluorooctane sulfonic acid (PFOS)	1763-23-1	Not Determined	----	MS recovery not determined, background level greater than or equal to 4x spike level.



Matrix: **WATER**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
Matrix Spike (MS) Recoveries - Continued							
EP231A: Perfluoroalkyl Sulfonic Acids	ET2204605--082	0229_MW138_220824	Perfluorooctane sulfonic acid (PFOS)	1763-23-1	Not Determined	----	MS recovery not determined, background level greater than or equal to 4x spike level.
EP231B: Perfluoroalkyl Carboxylic Acids	ET2204605--069	0229_MW122_220824	Perfluorobutanoic acid (PFBA)	375-22-4	69.2 %	73.0-129%	Recovery less than lower data quality objective
EP231B: Perfluoroalkyl Carboxylic Acids	ET2204605--082	0229_MW138_220824	Perfluorobutanoic acid (PFBA)	375-22-4	52.1 %	73.0-129%	Recovery less than lower data quality objective
EP231B: Perfluoroalkyl Carboxylic Acids	ET2204605--082	0229_MW138_220824	Perfluorohexanoic acid (PFHxA)	307-24-4	Not Determined	----	MS recovery not determined, background level greater than or equal to 4x spike level.

Regular Sample Surrogates

Sub-Matrix: **SEDIMENT**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
Samples Submitted							
EP231S: PFAS Surrogate	ET2204605-020	0229_SD119_220822	13C4-PFOS	----	63.0 %	68.0-136 %	Recovery less than lower data quality objective
EP231S: PFAS Surrogate	ET2204605-033	0229_SD205_220822	13C4-PFOS	----	58.5 %	68.0-136 %	Recovery less than lower data quality objective

Outliers : Analysis Holding Time Compliance

Matrix: **SOIL**

Method	Extraction / Preparation			Analysis			
	Container / Client Sample ID(s)	Date extracted	Due for extraction	Days overdue	Date analysed	Due for analysis	Days overdue
EA055: Moisture Content (Dried @ 105-110°C)							
HDPE Soil Jar							
0229_SD144_220822	----	----	----	----	12-Sep-2022	05-Sep-2022	7

Outliers : Frequency of Quality Control Samples

Matrix: **WATER**

Quality Control Sample Type	Count		Rate (%)		Quality Control Specification
	QC	Regular	Actual	Expected	
Laboratory Duplicates (DUP)					
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	7	73	9.59	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: 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)								
0229_SD109_220822, 0229_SD113_220822, 0229_SD129_220822, 0229_SD132_220822, 0229_SD139_220822, 0229_SD205_220822, 0229_SD203_220822, 0229_QC100_220822, 0229_QC103_220822, 0229_SD242_220822, 0229_SD232_220822, 0229_SD135_220822	0229_SD110_220822, 0229_SD119_220822, 0229_SD130_220822, 0229_SD134_220822, 0229_SD140_220822, 0229_SD217_220822, 0229_SD220_220822, 0229_QC102_220822, 0229_SD243_220822, 0229_SD233_220822, 0229_SD121_220822	22-Aug-2022	----	----	----	05-Sep-2022	05-Sep-2022	✓
HDPE Soil Jar (EA055)								
0229_SD144_220822		22-Aug-2022	----	----	----	12-Sep-2022	05-Sep-2022	*
HDPE Soil Jar (EA055)								
0229_SD136_220823, 0229_SD128_220823, 0229_QC105_220823, 0229_SD244_220823	0229_SD133_220823, 0229_SD126_220823, 0229_SD245_220823, 0229_SD227_220823	23-Aug-2022	----	----	----	05-Sep-2022	06-Sep-2022	✓
HDPE Soil Jar (EA055)								
0229_SD211_220825	0229_SD212_220825	25-Aug-2022	----	----	----	05-Sep-2022	08-Sep-2022	✓



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	
EP231A: Perfluoroalkyl Sulfonic Acids								
HDPE Soil Jar (EP231X) 0229_SD109_220822, 0229_SD113_220822, 0229_SD129_220822, 0229_SD132_220822, 0229_SD139_220822, 0229_SD205_220822,	0229_SD110_220822, 0229_SD119_220822, 0229_SD130_220822, 0229_SD134_220822, 0229_SD140_220822, 0229_SD217_220822	22-Aug-2022	07-Sep-2022	18-Feb-2023	✓	09-Sep-2022	17-Oct-2022	✓
HDPE Soil Jar (EP231X) 0229_SD203_220822, 0229_QC100_220822, 0229_QC103_220822, 0229_SD242_220822, 0229_SD232_220822, 0229_SD135_220822	0229_SD220_220822, 0229_QC102_220822, 0229_SD243_220822, 0229_SD233_220822, 0229_SD121_220822	22-Aug-2022	13-Sep-2022	18-Feb-2023	✓	13-Sep-2022	23-Oct-2022	✓
HDPE Soil Jar (EP231X) 0229_SD144_220822		22-Aug-2022	14-Sep-2022	18-Feb-2023	✓	14-Sep-2022	24-Oct-2022	✓
HDPE Soil Jar (EP231X) 0229_SD136_220823, 0229_SD128_220823, 0229_QC105_220823, 0229_SD244_220823,	0229_SD133_220823, 0229_SD126_220823, 0229_SD245_220823, 0229_SD227_220823	23-Aug-2022	07-Sep-2022	19-Feb-2023	✓	09-Sep-2022	17-Oct-2022	✓
HDPE Soil Jar (EP231X) 0229_SD211_220825,	0229_SD212_220825	25-Aug-2022	13-Sep-2022	21-Feb-2023	✓	13-Sep-2022	23-Oct-2022	✓



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	
EP231B: Perfluoroalkyl Carboxylic Acids								
HDPE Soil Jar (EP231X) 0229_SD109_220822, 0229_SD113_220822, 0229_SD129_220822, 0229_SD132_220822, 0229_SD139_220822, 0229_SD205_220822,	0229_SD110_220822, 0229_SD119_220822, 0229_SD130_220822, 0229_SD134_220822, 0229_SD140_220822, 0229_SD217_220822	22-Aug-2022	07-Sep-2022	18-Feb-2023	✓	09-Sep-2022	17-Oct-2022	✓
HDPE Soil Jar (EP231X) 0229_SD203_220822, 0229_QC100_220822, 0229_QC103_220822, 0229_SD242_220822, 0229_SD232_220822, 0229_SD135_220822	0229_SD220_220822, 0229_QC102_220822, 0229_SD243_220822, 0229_SD233_220822, 0229_SD121_220822	22-Aug-2022	13-Sep-2022	18-Feb-2023	✓	13-Sep-2022	23-Oct-2022	✓
HDPE Soil Jar (EP231X) 0229_SD144_220822		22-Aug-2022	14-Sep-2022	18-Feb-2023	✓	14-Sep-2022	24-Oct-2022	✓
HDPE Soil Jar (EP231X) 0229_SD136_220823, 0229_SD128_220823, 0229_QC105_220823, 0229_SD244_220823,	0229_SD133_220823, 0229_SD126_220823, 0229_SD245_220823, 0229_SD227_220823	23-Aug-2022	07-Sep-2022	19-Feb-2023	✓	09-Sep-2022	17-Oct-2022	✓
HDPE Soil Jar (EP231X) 0229_SD211_220825,	0229_SD212_220825	25-Aug-2022	13-Sep-2022	21-Feb-2023	✓	13-Sep-2022	23-Oct-2022	✓



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) 0229_SD109_220822, 0229_SD113_220822, 0229_SD129_220822, 0229_SD132_220822, 0229_SD139_220822, 0229_SD205_220822,	0229_SD110_220822, 0229_SD119_220822, 0229_SD130_220822, 0229_SD134_220822, 0229_SD140_220822, 0229_SD217_220822	22-Aug-2022	07-Sep-2022	18-Feb-2023	✓	09-Sep-2022	17-Oct-2022	✓
HDPE Soil Jar (EP231X) 0229_SD203_220822, 0229_QC100_220822, 0229_QC103_220822, 0229_SD242_220822, 0229_SD232_220822, 0229_SD135_220822	0229_SD220_220822, 0229_QC102_220822, 0229_SD243_220822, 0229_SD233_220822, 0229_SD121_220822	22-Aug-2022	13-Sep-2022	18-Feb-2023	✓	13-Sep-2022	23-Oct-2022	✓
HDPE Soil Jar (EP231X) 0229_SD144_220822		22-Aug-2022	14-Sep-2022	18-Feb-2023	✓	14-Sep-2022	24-Oct-2022	✓
HDPE Soil Jar (EP231X) 0229_SD136_220823, 0229_SD128_220823, 0229_QC105_220823, 0229_SD244_220823,	0229_SD133_220823, 0229_SD126_220823, 0229_SD245_220823, 0229_SD227_220823	23-Aug-2022	07-Sep-2022	19-Feb-2023	✓	09-Sep-2022	17-Oct-2022	✓
HDPE Soil Jar (EP231X) 0229_SD211_220825,	0229_SD212_220825	25-Aug-2022	13-Sep-2022	21-Feb-2023	✓	13-Sep-2022	23-Oct-2022	✓



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) 0229_SD109_220822, 0229_SD113_220822, 0229_SD129_220822, 0229_SD132_220822, 0229_SD139_220822, 0229_SD205_220822,	0229_SD110_220822, 0229_SD119_220822, 0229_SD130_220822, 0229_SD134_220822, 0229_SD140_220822, 0229_SD217_220822	22-Aug-2022	07-Sep-2022	18-Feb-2023	✓	09-Sep-2022	17-Oct-2022	✓
HDPE Soil Jar (EP231X) 0229_SD203_220822, 0229_QC100_220822, 0229_QC103_220822, 0229_SD242_220822, 0229_SD232_220822, 0229_SD135_220822	0229_SD220_220822, 0229_QC102_220822, 0229_SD243_220822, 0229_SD233_220822, 0229_SD121_220822	22-Aug-2022	13-Sep-2022	18-Feb-2023	✓	13-Sep-2022	23-Oct-2022	✓
HDPE Soil Jar (EP231X) 0229_SD144_220822		22-Aug-2022	14-Sep-2022	18-Feb-2023	✓	14-Sep-2022	24-Oct-2022	✓
HDPE Soil Jar (EP231X) 0229_SD136_220823, 0229_SD128_220823, 0229_QC105_220823, 0229_SD244_220823,	0229_SD133_220823, 0229_SD126_220823, 0229_SD245_220823, 0229_SD227_220823	23-Aug-2022	07-Sep-2022	19-Feb-2023	✓	09-Sep-2022	17-Oct-2022	✓
HDPE Soil Jar (EP231X) 0229_SD211_220825,	0229_SD212_220825	25-Aug-2022	13-Sep-2022	21-Feb-2023	✓	13-Sep-2022	23-Oct-2022	✓



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) 0229_SD109_220822, 0229_SD110_220822, 0229_SD113_220822, 0229_SD119_220822, 0229_SD129_220822, 0229_SD130_220822, 0229_SD132_220822, 0229_SD134_220822, 0229_SD139_220822, 0229_SD140_220822, 0229_SD205_220822, 0229_SD217_220822	22-Aug-2022	07-Sep-2022	18-Feb-2023	✓	09-Sep-2022	17-Oct-2022	✓
HDPE Soil Jar (EP231X) 0229_SD203_220822, 0229_SD220_220822, 0229_QC100_220822, 0229_QC102_220822, 0229_QC103_220822, 0229_SD243_220822, 0229_SD242_220822, 0229_SD233_220822, 0229_SD232_220822, 0229_SD121_220822, 0229_SD135_220822	22-Aug-2022	13-Sep-2022	18-Feb-2023	✓	13-Sep-2022	23-Oct-2022	✓
HDPE Soil Jar (EP231X) 0229_SD144_220822	22-Aug-2022	14-Sep-2022	18-Feb-2023	✓	14-Sep-2022	24-Oct-2022	✓
HDPE Soil Jar (EP231X) 0229_SD136_220823, 0229_SD133_220823, 0229_SD128_220823, 0229_SD126_220823, 0229_QC105_220823, 0229_SD245_220823, 0229_SD244_220823, 0229_SD227_220823	23-Aug-2022	07-Sep-2022	19-Feb-2023	✓	09-Sep-2022	17-Oct-2022	✓
HDPE Soil Jar (EP231X) 0229_SD211_220825, 0229_SD212_220825	25-Aug-2022	13-Sep-2022	21-Feb-2023	✓	13-Sep-2022	23-Oct-2022	✓

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

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 Work Order : ET2204605
 Client : XXXXXXXXXX
 Project : QLD_0229_PFASOMP_20



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 - Continued									
0229_SW211_220825, 0229_MW123S_220825, 0229_MW139_220825, 0229_MW002_220825, 0229_MW074_220825, 0229_MW018_220825, 0229_QC304_220825,	0229_SW212_220825, 0229_MW072_220825, 0229_MW065_220825, 0229_MW106_220825, 0229_MW226_220825, 0229_MW235S_220825, 0229_QC305_220825	25-Aug-2022	14-Sep-2022	21-Feb-2023	✓	14-Sep-2022	21-Feb-2023	✓	
HDPE (no PTFE) (EP231X) 0229_MW131_220826,	0229_QC306_220826	26-Aug-2022	14-Sep-2022	22-Feb-2023	✓	14-Sep-2022	22-Feb-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	
EP231B: Perfluoroalkyl Carboxylic Acids - Continued								
0229_SW211_220825, 0229_MW123S_220825, 0229_MW139_220825, 0229_MW002_220825, 0229_MW074_220825, 0229_MW018_220825, 0229_QC304_220825,	0229_SW212_220825, 0229_MW072_220825, 0229_MW065_220825, 0229_MW106_220825, 0229_MW226_220825, 0229_MW235S_220825, 0229_QC305_220825	25-Aug-2022	14-Sep-2022	21-Feb-2023	✓	14-Sep-2022	21-Feb-2023	✓
HDPE (no PTFE) (EP231X) 0229_MW131_220826,	0229_QC306_220826	26-Aug-2022	14-Sep-2022	22-Feb-2023	✓	14-Sep-2022	22-Feb-2023	✓

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 Work Order : ET2204605
 Client : XXXXXXXXXX
 Project : QLD_0229_PFASOMP_20



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 - Continued									
0229_SW211_220825, 0229_MW123S_220825, 0229_MW139_220825, 0229_MW002_220825, 0229_MW074_220825, 0229_MW018_220825, 0229_QC304_220825,	0229_SW212_220825, 0229_MW072_220825, 0229_MW065_220825, 0229_MW106_220825, 0229_MW226_220825, 0229_MW235S_220825, 0229_QC305_220825	25-Aug-2022	14-Sep-2022	21-Feb-2023	✓	14-Sep-2022	21-Feb-2023	✓	
HDPE (no PTFE) (EP231X) 0229_MW131_220826,	0229_QC306_220826	26-Aug-2022	14-Sep-2022	22-Feb-2023	✓	14-Sep-2022	22-Feb-2023	✓	

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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 - Continued								
0229_SW211_220825, 0229_MW123S_220825, 0229_MW139_220825, 0229_MW002_220825, 0229_MW074_220825, 0229_MW018_220825, 0229_QC304_220825,	0229_SW212_220825, 0229_MW072_220825, 0229_MW065_220825, 0229_MW106_220825, 0229_MW226_220825, 0229_MW235S_220825, 0229_QC305_220825	25-Aug-2022	14-Sep-2022	21-Feb-2023	✓	14-Sep-2022	21-Feb-2023	✓
HDPE (no PTFE) (EP231X) 0229_MW131_220826,	0229_QC306_220826	26-Aug-2022	14-Sep-2022	22-Feb-2023	✓	14-Sep-2022	22-Feb-2023	✓

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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 - Continued									
0229_SW211_220825, 0229_MW123S_220825, 0229_MW139_220825, 0229_MW002_220825, 0229_MW074_220825, 0229_MW018_220825, 0229_QC304_220825,	0229_SW212_220825, 0229_MW072_220825, 0229_MW065_220825, 0229_MW106_220825, 0229_MW226_220825, 0229_MW235S_220825, 0229_QC305_220825	25-Aug-2022	14-Sep-2022	21-Feb-2023	✓	14-Sep-2022	21-Feb-2023	✓	
HDPE (no PTFE) (EP231X) 0229_MW131_220826,	0229_QC306_220826	26-Aug-2022	14-Sep-2022	22-Feb-2023	✓	14-Sep-2022	22-Feb-2023	✓	



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	Method	Count		Rate (%)			Quality Control Specification
		QC	Regular	Actual	Expected	Evaluation	
Analytical Methods							
Laboratory Duplicates (DUP)							
Moisture Content	EA055	5	34	14.71	10.00	✔	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	6	49	12.24	10.00	✔	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	3	49	6.12	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	3	49	6.12	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	3	49	6.12	5.00	✔	NEPM 2013 B3 & ALS QC Standard

Matrix: **WATER** Evaluation: ✖ = Quality Control frequency not within specification ; ✔ = Quality Control frequency within specification.

Quality Control Sample Type	Method	Count		Rate (%)			Quality Control Specification
		QC	Regular	Actual	Expected	Evaluation	
Analytical Methods							
Laboratory Duplicates (DUP)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	7	73	9.59	10.00	✖	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	4	73	5.48	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	4	73	5.48	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	4	73	5.48	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.
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
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.
Solid Phase Extraction (SPE) for PFAS in water	ORG72	WATER	In-house: Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to the sample container. The entire contents are transferred to a solid phase extraction (SPE) cartridge. The sample container is successively rinsed with aliquots of the elution solvent. The eluted extract is combined with an equal volume of reagent water and a portion is filtered for analysis. Method procedures conform to US DoD QSM 5.3, table B-15 requirements.



SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : ET2204605

Client	:	[REDACTED]	Laboratory	:	Environmental Division Townsville
Contact	:	[REDACTED]	Contact	:	[REDACTED]
Address	:	LEVEL 5 7-13 TOMLINS STREET SOUTH TOWNSVILLE 4810	Address	:	13 Carlton Street, Kirwan Townsville QLD Australia 4815
E-mail	:	[REDACTED]	E-mail	:	[REDACTED]
Telephone	:	----	Telephone	:	[REDACTED]
Facsimile	:	----	Facsimile	:	
Project	:	QLD_0229_PFASOMP_20	Page	:	1 of 6
Order number	:	60612487	Quote number	:	ET2021AECOMAU0001 (TV/007/21 v2 - Compass)
C-O-C number	:	41522	QC Level	:	NEPM 2013 B3 & ALS QC Standard
Site	:	QLD_0229			
Sampler	:	[REDACTED]			

Dates

Date Samples Received	:	30-Aug-2022 08:30	Issue Date	:	06-Sep-2022
Client Requested Due Date	:	15-Sep-2022	Scheduled Reporting Date	:	15-Sep-2022

Delivery Details

Mode of Delivery	:	Carrier	Security Seal	:	Intact.
No. of coolers/boxes	:	3	Temperature	:	4.1°C, 6.1°C, 3.4°C - Ice present
Receipt Detail	:	ESKY	No. of samples received / analysed	:	107 / 107

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 be advised that an additional sample bottle labelled "SD144" has been added to its corresponding sample ID (ALS #29). If this is incorrect or for more information, please contact Client Services at [REDACTED]**
- ***Samples were originally received by ALS Townsville on 26/08/22 (10.4°C, 16.7°C), and forwarded to ALS Brisbane for analysis.**
- **02/09/2022: Please be advised that as per the email from [REDACTED] on the 02/09/2022, the sample IDs have been adjusted on Samples ALS #1, 2, 6, 7, 9, 11, 13, 21, 24, 25, 88, 89, 91, 102, 103, 104, 105 & 106. Analysis has also been applied to samples ALS #102, 103, 104, 105 & 106.**
- **02/09/2022: #2 - Please be advised that the sampling dates for Samples ALS #1 & #2 have been adjusted as per the email from [REDACTED] on the 02/09/2022.**
- **06/09/2022: Please be advised that as per the email from [REDACTED] on the 06/09/2022, the second jar received for Sample (ALS) #29 has now been added onto the end of the work order as Sample (ALS) #107 and the Sample ID's have been updated.**
- Discounted Package Prices apply only when specific ALS Group Codes ('W', 'S', 'NT' suites) are referenced on COCs.
- **Analysis will be conducted by ALS Environmental, Melbourne, NATA accreditation No. 825, Site No. 13778.**
- Please direct any turn around / technical queries to the laboratory contact designated above.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months ± 1 week) from receipt of samples.
- **Extra samples were received labelled as 'SD121' (ALS #102), 'SD135' (ALS #103), 'SW_144' (ALS #104), 'QC304' (ALS #105) and 'QC305' (ALS #106) and have been placed on hold. If testing is required on these samples, please contact ALS Client Services at [REDACTED]**
- 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.

- **Please refer to the Proactive Holding Time Report table below which summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory. The laboratory will process these samples unless instructions are received from you indicating you do not wish to proceed. The absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.**



Sample 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)
ET2204605-001	23-Aug-2022 10:00	0229_SD136_220823	✓	✓
ET2204605-002	23-Aug-2022 10:35	0229_SD133_220823	✓	✓
ET2204605-003	23-Aug-2022 10:54	0229_SD128_220823	✓	✓
ET2204605-004	23-Aug-2022 11:20	0229_SD126_220823	✓	✓
ET2204605-005	23-Aug-2022 11:21	0229_QC105_220823	✓	✓
ET2204605-008	23-Aug-2022 09:10	0229_SD245_220823	✓	✓
ET2204605-010	23-Aug-2022 10:30	0229_SD244_220823	✓	✓
ET2204605-012	23-Aug-2022 11:40	0229_SD227_220823	✓	✓
ET2204605-015	22-Aug-2022 12:30	0229_SD109_220822	✓	✓
ET2204605-017	22-Aug-2022 13:37	0229_SD110_220822	✓	✓
ET2204605-019	22-Aug-2022 12:10	0229_SD113_220822	✓	✓
ET2204605-020	22-Aug-2022 12:02	0229_SD119_220822	✓	✓
ET2204605-022	22-Aug-2022 14:55	0229_SD129_220822	✓	✓
ET2204605-023	22-Aug-2022 14:45	0229_SD130_220822	✓	✓
ET2204605-024	22-Aug-2022 14:30	0229_SD132_220822	✓	✓
ET2204605-025	22-Aug-2022 14:15	0229_SD134_220822	✓	✓
ET2204605-027	22-Aug-2022 13:40	0229_SD139_220822	✓	✓
ET2204605-029	22-Aug-2022 13:50	0229_SD140_220822	✓	✓
ET2204605-033	22-Aug-2022 15:50	0229_SD205_220822	✓	✓
ET2204605-034	22-Aug-2022 11:20	0229_SD217_220822	✓	✓
ET2204605-035	22-Aug-2022 12:05	0229_SD203_220822	✓	✓
ET2204605-036	22-Aug-2022 16:10	0229_SD220_220822	✓	✓
ET2204605-037	22-Aug-2022 12:00	0229_QC100_220822	✓	✓
ET2204605-038	22-Aug-2022 12:00	0229_QC102_220822	✓	✓
ET2204605-039	22-Aug-2022 12:00	0229_QC103_220822	✓	✓
ET2204605-045	22-Aug-2022 12:40	0229_SD243_220822	✓	✓
ET2204605-047	22-Aug-2022 13:45	0229_SD242_220822	✓	✓
ET2204605-048	22-Aug-2022 15:25	0229_SD233_220822	✓	✓
ET2204605-049	22-Aug-2022 13:10	0229_SD232_220822	✓	✓
ET2204605-086	25-Aug-2022 16:12	0229_SD211_220825	✓	✓
ET2204605-087	25-Aug-2022 07:45	0229_SD212_220825	✓	✓
ET2204605-102	22-Aug-2022 11:10	0229_SD121_220822	✓	✓
ET2204605-103	22-Aug-2022 11:55	0229_SD135_220822	✓	✓
ET2204605-107	22-Aug-2022 14:40	0229_SD144_220822	✓	✓



Matrix: **WATER**

Laboratory sample ID	Sampling date / time	Sample ID	WATER - EP231X PFAS - Full Suite (28 analytes)
ET2204605-006	22-Aug-2022 11:45	0229_SW233_220822	✓
ET2204605-007	22-Aug-2022 12:00	0229_QC104_220822	✓
ET2204605-009	22-Aug-2022 09:10	0229_SW245_220822	✓
ET2204605-011	22-Aug-2022 10:30	0229_SW244_220822	✓
ET2204605-013	22-Aug-2022 11:40	0229_SW227_220822	✓
ET2204605-014	22-Aug-2022 12:30	0229_SW109_220822	✓
ET2204605-016	22-Aug-2022 13:37	0229_SW110_220822	✓
ET2204605-018	22-Aug-2022 12:20	0229_SW113_220822	✓
ET2204605-021	22-Aug-2022 11:10	0229_SW121_220822	✓
ET2204605-026	22-Aug-2022 11:55	0229_SW135_220822	✓
ET2204605-028	22-Aug-2022 13:40	0229_SW139_220822	✓
ET2204605-030	22-Aug-2022 13:40	0229_SW140_220822	✓
ET2204605-031	22-Aug-2022 11:20	0229_SW217_220822	✓
ET2204605-032	22-Aug-2022 15:50	0229_SW205_220822	✓
ET2204605-040	22-Aug-2022 17:00	0229_QC301_220822	✓
ET2204605-041	22-Aug-2022 10:00	0229_QC500_220822	✓
ET2204605-042	22-Aug-2022 12:00	0229_QC101_220822	✓
ET2204605-043	22-Aug-2022 16:20	0229_QC300_220822	✓
ET2204605-044	22-Aug-2022 12:40	0229_SW243_220822	✓
ET2204605-046	22-Aug-2022 13:45	0229_SW242_220822	✓
ET2204605-050	22-Aug-2022 13:10	0229_SW232_220822	✓
ET2204605-051	22-Aug-2022 16:10	0229_SW220_220822	✓
ET2204605-052	22-Aug-2022 12:05	0229_SW203_220822	✓
ET2204605-053	23-Aug-2022 17:00	0229_QC302_220823	✓
ET2204605-054	24-Aug-2022 08:51	0229_MW125S_220824	✓
ET2204605-055	24-Aug-2022 08:52	0229_MW125I_220824	✓
ET2204605-056	24-Aug-2022 09:01	0229_MW124_220824	✓
ET2204605-057	24-Aug-2022 09:18	0229_MW123I_220824	✓
ET2204605-058	24-Aug-2022 10:00	0229_MW105_220824	✓
ET2204605-059	24-Aug-2022 09:19	0229_MW217_220824	✓
ET2204605-060	24-Aug-2022 09:58	0229_MW212_220824	✓
ET2204605-061	24-Aug-2022 09:59	0229_QC106_220824	✓
ET2204605-062	24-Aug-2022 10:09	0229_MW128_220824	✓
ET2204605-063	24-Aug-2022 10:10	0229_QC107_220824	✓
ET2204605-064	24-Aug-2022 10:25	0229_MW102_220824	✓
ET2204605-065	24-Aug-2022 10:17	0229_MW233_220824	✓
ET2204605-066	24-Aug-2022 10:26	0229_QC108_220824	✓
ET2204605-067	24-Aug-2022 10:34	0229_MW003_220824	✓
ET2204605-068	24-Aug-2022 10:51	0229_MW220S_220824	✓
ET2204605-069	24-Aug-2022 11:08	0229_MW122_220824	✓
ET2204605-070	24-Aug-2022 11:20	0229_MW121_220824	✓



WATER - EP231X
PFAS - Full Suite (28 analytes)

ET2204605-071	24-Aug-2022 11:43	0229_MW101_220824	✓
ET2204605-072	24-Aug-2022 12:35	0229_MW141_220824	✓
ET2204605-073	24-Aug-2022 11:38	0229_MW116_220824	✓
ET2204605-074	24-Aug-2022 12:03	0229_MW115_220824	✓
ET2204605-075	24-Aug-2022 12:41	0229_QC109_220824	✓
ET2204605-076	24-Aug-2022 13:08	0229_MW118_220824	✓
ET2204605-077	24-Aug-2022 13:30	0229_MW119_220824	✓
ET2204605-078	24-Aug-2022 14:00	0229_MW135_220824	✓
ET2204605-079	24-Aug-2022 14:25	0229_MW114_220824	✓
ET2204605-080	24-Aug-2022 14:35	0229_MW120_220824	✓
ET2204605-081	24-Aug-2022 14:41	0229_MW236S_220824	✓
ET2204605-082	24-Aug-2022 14:50	0229_MW138_220824	✓
ET2204605-083	24-Aug-2022 15:10	0229_MW205S_220824	✓
ET2204605-084	24-Aug-2022 15:26	0229_QC303_220824	✓
ET2204605-085	24-Aug-2022 15:38	0229_MW232_220824	✓
ET2204605-088	25-Aug-2022 07:00	0229_SW211_220825	✓
ET2204605-089	25-Aug-2022 07:00	0229_SW212_220825	✓
ET2204605-090	25-Aug-2022 11:30	0229_MW123S_220825	✓
ET2204605-091	25-Aug-2022 13:05	0229_MW072_220825	✓
ET2204605-092	25-Aug-2022 13:47	0229_MW139_220825	✓
ET2204605-093	25-Aug-2022 10:50	0229_MW065_220825	✓
ET2204605-094	25-Aug-2022 12:10	0229_MW002_220825	✓
ET2204605-095	25-Aug-2022 12:15	0229_MW106_220825	✓
ET2204605-096	25-Aug-2022 13:24	0229_MW074_220825	✓
ET2204605-097	25-Aug-2022 07:10	0229_MW226_220825	✓
ET2204605-098	25-Aug-2022 14:15	0229_MW018_220825	✓
ET2204605-099	25-Aug-2022 08:50	0229_MW235S_220825	✓
ET2204605-100	26-Aug-2022 13:30	0229_MW131_220826	✓
ET2204605-101	26-Aug-2022 13:40	0229_QC306_220826	✓
ET2204605-104	22-Aug-2022 13:48	0229_SW144_220822	✓
ET2204605-105	25-Aug-2022 16:00	0229_QC304_220825	✓
ET2204605-106	25-Aug-2022 16:00	0229_QC305_220825	✓

Proactive Holding Time Report

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



Requested Deliverables

ACCOUNTS PAYABLE

- A4 - AU Tax Invoice (INV)

Email

[REDACTED]

[REDACTED]

- *AU Certificate of Analysis - NATA (COA)
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)
- A4 - AU Tax Invoice (INV)
- Chain of Custody (CoC) (COC)
- EDI Format - ENMRG (ENMRG)
- EDI Format - ESDAT (ESDAT)

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DERP ESDAT REPORTS

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

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- *AU Certificate of Analysis - NATA (COA)
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)
- A4 - AU Tax Invoice (INV)
- Chain of Custody (CoC) (COC)
- EDI Format - EQUIS V5 AECOM (EQUIS_V5_AECOM)
- EDI Format - ESDAT (ESDAT)

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

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REPORT OF ANALYSIS

Client :	████████████████████	Job No. :	AECO06/220905
	LEVEL 8	Quote No. :	QT-02018
	540 WICKHAM STREET	Order No. :	60612487_3_1
Attention :	████████████████████	Date Received :	05-SEP-2022
Project Name :	QLD_0229_PFASOMP_20	Sampled By :	CLIENT
Your Client Services Manager :	████████████████████	Phone :	02 9449 0169

Lab Reg No.	Sample Ref	Sample Description
N22/017409	0229_QC200_220822	SOIL 22/08/22
N22/017411	0229_QC202_220822	SOIL 22/08/22
N22/017412	0229_QC203_220822	SOIL 22/08/22
N22/017414	0229_QC205_220823	SOIL 23/08/22

Lab Reg No.		N22/017409	N22/017411	N22/017412	N22/017414	
Date Sampled		22-AUG-2022	22-AUG-2022	22-AUG-2022	23-AUG-2022	
	Units					Method
PFAS (per-and poly-fluoroalkyl substances)						
PFBA (375-22-4)	mg/kg	<0.002	<0.002	<0.002	<0.002	NR70
PFPeA (2706-90-3)	mg/kg	<0.002	<0.002	<0.002	<0.002	NR70
PFHxA (307-24-4)	mg/kg	<0.001	<0.001	<0.001	<0.001	NR70
PFHpA (375-85-9)	mg/kg	<0.001	<0.001	<0.001	<0.001	NR70
PFOA (335-67-1)	mg/kg	<0.001	<0.001	<0.001	<0.001	NR70
PFNA (375-95-1)	mg/kg	<0.001	<0.001	<0.001	<0.001	NR70
PFDA (335-76-2)	mg/kg	<0.001	<0.001	<0.001	<0.001	NR70
PFUdA (2058-94-8)	mg/kg	<0.002	<0.002	<0.002	<0.002	NR70
PFDaA (307-55-1)	mg/kg	<0.002	<0.002	<0.002	<0.002	NR70
PFTrDA (72629-94-8)	mg/kg	<0.002	<0.002	<0.002	<0.002	NR70
PFTeDA (376-06-7)	mg/kg	<0.002	<0.002	<0.002	<0.002	NR70
PFHxDA (67905-19-5)	mg/kg	<0.002	<0.002	<0.002	<0.002	NR70
PFODA (16517-11-6)	mg/kg	<0.005	<0.005	<0.005	<0.005	NR70
FOUEA (70887-84-2)	mg/kg	<0.001	<0.001	<0.001	<0.01	NR70
PFBS (375-73-5)	mg/kg	<0.001	<0.001	<0.001	<0.001	NR70
PFPeS (2706-91-4)	mg/kg	<0.001	<0.001	<0.001	<0.001	NR70
PFHxS (355-46-4)	mg/kg	<0.001	<0.001	0.0012	<0.001	NR70
PFHpS (375-92-8)	mg/kg	<0.001	<0.001	<0.001	<0.001	NR70
PFOS (1763-23-1)	mg/kg	<0.002	<0.002	0.0071	0.0064	NR70
PFNS (68259-12-1)	mg/kg	<0.001	<0.001	<0.001	<0.001	NR70
PFDS (335-77-3)	mg/kg	<0.001	<0.001	<0.001	<0.001	NR70
PFOSA (754-91-6)	mg/kg	<0.001	<0.001	<0.001	<0.001	NR70
N-MeFOSA (31506-32-8)	mg/kg	<0.002	<0.002	<0.002	<0.002	NR70
N-EtFOSA (4151-50-2)	mg/kg	<0.002	<0.002	<0.002	<0.002	NR70
N-MeFOSAA (2355-31-9)	mg/kg	<0.002	<0.002	<0.002	<0.002	NR70
N-EtFOSAA(2991-50-6)	mg/kg	<0.002	<0.002	<0.002	<0.002	NR70
N-MeFOSE (24448-09-7)	mg/kg	<0.005	<0.005	<0.005	<0.005	NR70

REPORT OF ANALYSIS

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Report No. RN1365263

Lab Reg No.		N22/017409	N22/017411	N22/017412	N22/017414	
Date Sampled		22-AUG-2022	22-AUG-2022	22-AUG-2022	23-AUG-2022	
	Units					Method
PFAS (per-and poly-fluoroalkyl substances)						
N-EtFOSE (1691-99-2)	mg/kg	<0.005	<0.005	<0.005	<0.005	NR70
4:2 FTS (757124-72-4)	mg/kg	<0.001	<0.001	<0.001	<0.001	NR70
6:2 FTS (27619-97-2)	mg/kg	<0.001	<0.001	<0.001	<0.001	NR70
8:2 FTS (39108-34-4)	mg/kg	<0.001	<0.001	<0.001	<0.001	NR70
10:2 FTS (120226-60-0)	mg/kg	<0.002	<0.002	<0.002	<0.002	NR70
8:2 diPAP (678-41-1)	mg/kg	<0.002	<0.002	<0.002	<0.002	NR70
PFBA (Surrogate Recovery)	%	149	136	141	141	NR70
PFPeA (Surrogate Recovery)	%	148	125	134	133	NR70
PFHxA (Surrogate Recovery)	%	144	120	138	134	NR70
PFHpA (Surrogate Recovery)	%	143	124	138	130	NR70
PFOA (Surrogate Recovery)	%	149	126	131	134	NR70
PFNA (Surrogate Recovery)	%	142	125	139	128	NR70
PFDA (Surrogate Recovery)	%	153	131	154	143	NR70
PFUdA (Surrogate Recovery)	%	149	131	149	131	NR70
PFDoA (Surrogate Recovery)	%	155	137	152	128	NR70
PFTeDA (Surrogate Recovery)	%	160	140	167	146	NR70
PFHxDA (Surrogate Recovery)	%	163	142	159	164	NR70
FOUEA (Surrogate Recovery)	%	78	82	87	12	NR70
PFBS (Surrogate Recovery)	%	136	117	129	118	NR70
PFHxS (Surrogate Recovery)	%	144	115	134	123	NR70
PFOS (Surrogate Recovery)	%	148	136	138	132	NR70
PFOSA (Surrogate Recovery)	%	137	128	137	126	NR70
N-MeFOSA (Surrogate Recovery)	%	139	120	131	125	NR70
N-EtFOSA (Surrogate Recovery)	%	135	116	122	123	NR70
N-MeFOSAA (Surrogate Recovery)	%	160	124	141	112	NR70
N-EtFOSAA (Surrogate Recovery)	%	164	133	154	114	NR70
N-MeFOSE (Surrogate Recovery)	%	141	112	119	121	NR70
N-EtFOSE (Surrogate Recovery)	%	110	92	99	98	NR70
4:2 FTS (Surrogate Recovery)	%	125	90	126	102	NR70
6:2 FTS (Surrogate Recovery)	%	135	97	129	98	NR70
8:2 FTS (Surrogate Recovery)	%	132	88	128	89	NR70
8:2 diPAP (Surrogate Recovery)	%	175	144	170	156	NR70
Dates						
Date extracted		7-SEP-2022	7-SEP-2022	7-SEP-2022	7-SEP-2022	
Date analysed		9-SEP-2022	9-SEP-2022	9-SEP-2022	9-SEP-2022	

N22/017409
to
N22/017414

REPORT OF ANALYSIS

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Report No. RN1365263

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

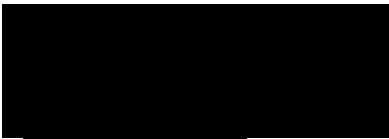
Selected PFAS surrogate recoveries are biased due to matrix effects.^δ
High PFAS surrogate recoveries accepted - results corrected for recovery.
Surrogate recoveries low for selected analytes - PFAS LORs not raised since S/N > 10.
LOR raised for FOUEA in sample N22/017414 due to low surrogate recovery



Organics - NSW
Accreditation No. 198

14-SEP-2022

Lab Reg No.		N22/017409	N22/017411	N22/017412	N22/017414	
Date Sampled		22-AUG-2022	22-AUG-2022	22-AUG-2022	23-AUG-2022	
	Units					Method
Trace Elements						
Total Solids	%	73	78.4	69.1	53.2	NT2_49
Dates						
Date extracted		6-SEP-2022	6-SEP-2022	6-SEP-2022	6-SEP-2022	
Date analysed		7-SEP-2022	7-SEP-2022	7-SEP-2022	7-SEP-2022	



Inorganics - NSW
Accreditation No. 198

14-SEP-2022

All results are expressed on a dry weight basis.

REPORT OF ANALYSIS

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Report No. RN1365263

Client : ██████████ LEVEL 8 540 WICKHAM STREET Attention : ██████████ Project Name : QLD_0229_PFASOMP_20 Your Client Services Manager : ██████████	Job No. : AECO06/220905 Quote No. : QT-02018 Order No. : 60612487_3_1 Date Received : 05-SEP-2022 Sampled By : CLIENT Phone : 02 9449 0169
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Lab Reg No.	Sample Ref	Sample Description
N22/017410	0229_QC201_220822	WATER 22/08/22
N22/017413	0229_QC204_220823	WATER 23/08/22
N22/017415	0229_QC206_220824	WATER 24/08/22
N22/017416	0229_QC207_220824	WATER 24/08/22

Lab Reg No.	Date Sampled	Units	N22/017410	N22/017413	N22/017415	N22/017416	Method
			22-AUG-2022	23-AUG-2022	24-AUG-2022	24-AUG-2022	
PFAS (per-and poly-fluoroalkyl substances)							
PFBA (375-22-4)	ug/L		<0.05	<0.05	<0.05	2.8	NR70
PFPeA (2706-90-3)	ug/L		<0.02	0.035	<0.02	5.6	NR70
PFHxA (307-24-4)	ug/L		<0.01	0.16	<0.01	26	NR70
PFHpA (375-85-9)	ug/L		<0.01	0.019	<0.01	2.6	NR70
PFOA (335-67-1)	ug/L		<0.01	0.045	<0.01	4.9	NR70
PFNA (375-95-1)	ug/L		<0.01	<0.01	<0.01	2.4	NR70
PFDA (335-76-2)	ug/L		<0.01	<0.01	<0.01	0.055	NR70
PFUdA (2058-94-8)	ug/L		<0.01	<0.01	<0.01	0.044	NR70
PFDoA (307-55-1)	ug/L		<0.01	<0.01	<0.01	<0.01	NR70
PFTTrDA (72629-94-8)	ug/L		<0.02	<0.02	<0.02	<0.02	NR70
PFTeDA (376-06-7)	ug/L		<0.02	<0.02	<0.02	<0.02	NR70
PFHxDA (67905-19-5)	ug/L		<0.02	<0.02	<0.02	<0.02	NR70
PFODA (16517-11-6)	ug/L		<0.05	<0.05	<0.05	<0.05	NR70
FOUEA (70887-84-2)	ug/L		<0.01	<0.01	<0.01	<0.01	NR70
PFDS (335-77-3)	ug/L		<0.01	<0.01	<0.01	<0.01	NR70
PFPeS (2706-91-4)	ug/L		<0.01	0.10	<0.01	11	NR70
PFHxS (355-46-4)	ug/L		0.011	0.78	<0.01	120	NR70
PFHpS (375-92-8)	ug/L		<0.01	0.026	<0.01	5.3	NR70
PFOS (1763-23-1)	ug/L		<0.02	0.63	<0.02	100	NR70
PFNS (68259-12-1)	ug/L		<0.01	<0.01	<0.01	0.018	NR70
PFBS (375-73-5)	ug/L		0.011	0.13	<0.01	12	NR70
PFOSA (754-91-6)	ug/L		<0.01	<0.01	<0.01	0.16	NR70
N-MeFOSA (31506-32-8)	ug/L		<0.02	<0.02	<0.02	<0.02	NR70
N-EtFOSA (4151-50-2)	ug/L		<0.02	<0.02	<0.02	<0.02	NR70
N-MeFOSAA (2355-31-9)	ug/L		<0.01	<0.01	<0.01	<0.01	NR70
N-EtFOSAA(2991-50-6)	ug/L		<0.01	<0.01	<0.01	<0.01	NR70
N-MeFOSE (24448-09-7)	ug/L		<0.05	<0.05	<0.05	<0.05	NR70

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Lab Reg No.			N22/017410	N22/017413	N22/017415	N22/017416	
Date Sampled			22-AUG-2022	23-AUG-2022	24-AUG-2022	24-AUG-2022	
		Units					Method
PFAS (per- and poly-fluoroalkyl substances)							
N-EtFOSE (1691-99-2)	ug/L	<0.05	<0.05	<0.05	<0.05	<0.05	NR70
4:2 FTS (757124-72-4)	ug/L	<0.01	<0.01	<0.01	<0.01	<0.01	NR70
6:2 FTS (27619-97-2)	ug/L	<0.01	<0.01	<0.01	0.11	0.11	NR70
8:2 FTS (39108-34-4)	ug/L	<0.01	<0.01	<0.01	0.019	0.019	NR70
10:2 FTS (120226-60-0)	ug/L	<0.01	<0.01	<0.01	<0.01	<0.01	NR70
8:2 diPAP (678-41-1)	ug/L	<0.02	<0.02	<0.02	<0.02	<0.02	NR70
PFBA (Surrogate Recovery)	%	120	123	128	132	132	NR70
PFPeA (Surrogate Recovery)	%	140	143	134	117	117	NR70
PFHxA (Surrogate Recovery)	%	109	118	116	123	123	NR70
PFHpA (Surrogate Recovery)	%	114	120	121	129	129	NR70
PFOA (Surrogate Recovery)	%	116	128	137	131	131	NR70
PFNA (Surrogate Recovery)	%	120	121	125	114	114	NR70
PFDA (Surrogate Recovery)	%	123	129	128	136	136	NR70
PFUdA (Surrogate Recovery)	%	102	110	117	127	127	NR70
PFDoA (Surrogate Recovery)	%	86	96	109	119	119	NR70
PFTeDA (Surrogate Recovery)	%	86	100	90	94	94	NR70
PFHxDA (Surrogate Recovery)	%	99	111	124	198	198	NR70
FOUEA (Surrogate Recovery)	%	96	102	125	160	160	NR70
PFBS (Surrogate Recovery)	%	102	112	125	122	122	NR70
PFHxS (Surrogate Recovery)	%	112	113	129	136	136	NR70
PFOS (Surrogate Recovery)	%	118	126	123	151	151	NR70
PFOSA (Surrogate Recovery)	%	88	99	107	129	129	NR70
N-MeFOSA (Surrogate Recovery)	%	65	66	97	123	123	NR70
N-EtFOSA (Surrogate Recovery)	%	56	61	77	124	124	NR70
N-MeFOSAA (Surrogate Recovery)	%	76	88	102	129	129	NR70
N-EtFOSAA (Surrogate Recovery)	%	76	86	104	139	139	NR70
N-MeFOSE (Surrogate Recovery)	%	74	79	103	119	119	NR70
N-EtFOSE (Surrogate Recovery)	%	55	59	73	120	120	NR70
4:2 FTS (Surrogate Recovery)	%	172	147	227	96	96	NR70
6:2 FTS (Surrogate Recovery)	%	130	115	158	115	115	NR70
8:2 FTS (Surrogate Recovery)	%	95	88	109	99	99	NR70
8:2 diPAP (Surrogate Recovery)	%	72	85	96	116	116	NR70
Dates							
Date extracted		7-SEP-2022	7-SEP-2022	7-SEP-2022	7-SEP-2022	7-SEP-2022	
Date analysed		9-SEP-2022	9-SEP-2022	9-SEP-2022	9-SEP-2022	9-SEP-2022	

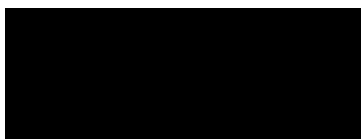
N22/017410
to
N22/017419

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

Selected PFAS surrogate recoveries are biased due to matrix effects.^δ
High PFAS surrogate recoveries accepted - results corrected for recovery.



Organics - NSW
Accreditation No. 198

14-SEP-2022

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Report No. RN1365263

Client : ██████████ LEVEL 8 540 WICKHAM STREET Attention : ██████████ Project Name : QLD_0229_PFASOMP_20 Your Client Services Manager : ██████████	Job No. : AECO06/220905 Quote No. : QT-02018 Order No. : 60612487_3_1 Date Received : 05-SEP-2022 Sampled By : CLIENT Phone : 02 9449 0169
---	---

Lab Reg No.	Sample Ref	Sample Description
N22/017417	0229_QC208_220824	WATER 24/08/22
N22/017418	0229_QC209_220824	WATER 24/08/22
N22/017419	0229_QC501_220902	WATER 02/09/22

Lab Reg No.	Date Sampled	Units	N22/017417	N22/017418	N22/017419	Method
			24-AUG-2022	24-AUG-2022	02-SEP-2022	
PFAS (per-and poly-fluoroalkyl substances)						
PFBA (375-22-4)	ug/L	0.098	0.067	<0.05		NR70
PFPeA (2706-90-3)	ug/L	0.099	0.049	<0.02		NR70
PFHxA (307-24-4)	ug/L	0.29	0.25	<0.01		NR70
PFHpA (375-85-9)	ug/L	0.068	0.017	<0.01		NR70
PFOA (335-67-1)	ug/L	0.13	0.035	<0.01		NR70
PFNA (375-95-1)	ug/L	<0.01	<0.01	<0.01		NR70
PFDA (335-76-2)	ug/L	<0.01	<0.01	<0.01		NR70
PFUdA (2058-94-8)	ug/L	<0.01	<0.01	<0.01		NR70
PFDoA (307-55-1)	ug/L	<0.01	<0.01	<0.01		NR70
PFTrDA (72629-94-8)	ug/L	<0.02	<0.02	<0.02		NR70
PFTeDA (376-06-7)	ug/L	<0.02	<0.02	<0.02		NR70
PFHxDA (67905-19-5)	ug/L	<0.02	<0.02	<0.02		NR70
PFODA (16517-11-6)	ug/L	<0.05	<0.05	<0.05		NR70
FOUEA (70887-84-2)	ug/L	<0.01	<0.01	<0.01		NR70
PFDS (335-77-3)	ug/L	<0.01	<0.01	<0.01		NR70
PFPeS (2706-91-4)	ug/L	0.32	0.13	<0.01		NR70
PFHxS (355-46-4)	ug/L	1.5	1.0	<0.01		NR70
PFHpS (375-92-8)	ug/L	0.12	0.031	<0.01		NR70
PFOS (1763-23-1)	ug/L	0.88	0.49	<0.02		NR70
PFNS (68259-12-1)	ug/L	<0.01	<0.01	<0.01		NR70
PFBS (375-73-5)	ug/L	0.43	0.16	<0.01		NR70
PFOSA (754-91-6)	ug/L	<0.01	<0.01	<0.01		NR70
N-MeFOSA (31506-32-8)	ug/L	<0.02	<0.02	<0.02		NR70
N-EtFOSA (4151-50-2)	ug/L	<0.02	<0.02	<0.02		NR70
N-MeFOSAA (2355-31-9)	ug/L	<0.01	<0.01	<0.01		NR70
N-EtFOSAA(2991-50-6)	ug/L	<0.01	<0.01	<0.01		NR70
N-MeFOSE (24448-09-7)	ug/L	<0.05	<0.05	<0.05		NR70
N-EtFOSE (1691-99-2)	ug/L	<0.05	<0.05	<0.05		NR70

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Lab Reg No.			N22/017417	N22/017418	N22/017419		
Date Sampled			24-AUG-2022	24-AUG-2022	02-SEP-2022		
		Units					Method
PFAS (per- and poly-fluoroalkyl substances)							
4:2 FTS (757124-72-4)	ug/L	<0.01	<0.01	<0.01	<0.01		NR70
6:2 FTS (27619-97-2)	ug/L	0.011	<0.01	<0.01	<0.01		NR70
8:2 FTS (39108-34-4)	ug/L	<0.01	<0.01	<0.01	<0.01		NR70
10:2 FTS (120226-60-0)	ug/L	<0.01	<0.01	<0.01	<0.01		NR70
8:2 diPAP (678-41-1)	ug/L	<0.02	<0.02	<0.02	<0.02		NR70
PFBA (Surrogate Recovery)	%	138	136	138			NR70
PFPeA (Surrogate Recovery)	%	167	143	136			NR70
PFHxA (Surrogate Recovery)	%	123	129	135			NR70
PFHpA (Surrogate Recovery)	%	130	134	131			NR70
PFOA (Surrogate Recovery)	%	141	139	138			NR70
PFNA (Surrogate Recovery)	%	131	135	132			NR70
PFDA (Surrogate Recovery)	%	138	145	131			NR70
PFUDA (Surrogate Recovery)	%	126	125	130			NR70
PFDoA (Surrogate Recovery)	%	115	131	128			NR70
PFTeDA (Surrogate Recovery)	%	111	125	121			NR70
PFHxDA (Surrogate Recovery)	%	134	146	131			NR70
FOUEA (Surrogate Recovery)	%	118	124	115			NR70
PFBS (Surrogate Recovery)	%	118	122	117			NR70
PFHxS (Surrogate Recovery)	%	126	127	136			NR70
PFOS (Surrogate Recovery)	%	135	138	134			NR70
PFOSA (Surrogate Recovery)	%	107	116	121			NR70
N-MeFOSA (Surrogate Recovery)	%	85	107	117			NR70
N-EtFOSA (Surrogate Recovery)	%	81	99	101			NR70
N-MeFOSAA (Surrogate Recovery)	%	103	115	119			NR70
N-EtFOSAA (Surrogate Recovery)	%	107	122	116			NR70
N-MeFOSE (Surrogate Recovery)	%	99	109	112			NR70
N-EtFOSE (Surrogate Recovery)	%	78	89	88			NR70
4:2 FTS (Surrogate Recovery)	%	139	120	138			NR70
6:2 FTS (Surrogate Recovery)	%	123	116	111			NR70
8:2 FTS (Surrogate Recovery)	%	104	110	109			NR70
8:2 diPAP (Surrogate Recovery)	%	88	109	95			NR70
Dates							
Date extracted		7-SEP-2022	7-SEP-2022	7-SEP-2022			
Date analysed		9-SEP-2022	9-SEP-2022	9-SEP-2022			



Organics - NSW
Accreditation No. 198

14-SEP-2022

105 Delhi Road, North Ryde NSW 2113 Tel: +61 2 9449 0111 Web: industry.gov.au/measurement

National Measurement Institute

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WORLD RECOGNISED
ACCREDITATION

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

This Report supersedes reports: *RN1365261*

Measurement Uncertainty is available upon request.

Note: Sampling date(s) have been provided by the client.

Chemical Accreditation 198: 105 Delhi Road, North Ryde, NSW, 2113



QUALITY ASSURANCE REPORT

Client: [REDACTED]

NMI QA Report No: AE006/220905

Sample Matrix: Liquid

Analyte	Method	LOR	Blank	Sample Duplicates			Recoveries	
				Sample	Duplicate	RPD	LCS	Matrix Spike
		ug/L	ug/L	ug/L	ug/L	%	%	%
PFBA (375-22-4)	NR70	0.05	<0.05	NA	NA	NA	134	NA
PFPeA (2706-90-3)	NR70	0.02	<0.02	NA	NA	NA	105	NA
PFHxA (307-24-4)	NR70	0.01	<0.01	NA	NA	NA	104	NA
PFHpA (375-85-9)	NR70	0.01	<0.01	NA	NA	NA	107	NA
PFOA (335-67-1)	NR70	0.01	<0.01	NA	NA	NA	110	NA
PFNA (375-95-1)	NR70	0.01	<0.01	NA	NA	NA	103	NA
PFDA (335-76-2)	NR70	0.01	<0.01	NA	NA	NA	101	NA
PFUDA (2058-94-8)	NR70	0.01	<0.01	NA	NA	NA	110	NA
PFDOA (307-55-1)	NR70	0.01	<0.01	NA	NA	NA	108	NA
PFTDA (72629-94-8)	NR70	0.02	<0.02	NA	NA	NA	106	NA
PFTeDA (376-06-7)	NR70	0.02	<0.02	NA	NA	NA	112	NA
PFHxDA (67905-19-5)	NR70	0.02	<0.02	NA	NA	NA	103	NA
PFODA (16517-11-6)	NR70	0.05	<0.05	NA	NA	NA	100	NA
FOUEA (70887-84-2)	NR70	0.01	<0.01	NA	NA	NA	107	NA
PFBS (375-73-5)	NR70	0.01	<0.01	NA	NA	NA	109	NA
PFPeS (2706-91-4)	NR70	0.01	<0.01	NA	NA	NA	122	NA
PFHxS (355-46-4)	NR70	0.01	<0.01	NA	NA	NA	104	NA
PFHpS (375-92-8)	NR70	0.01	<0.01	NA	NA	NA	110	NA
PFOS (1763-23-1)	NR70	0.02	<0.02	NA	NA	NA	103	NA
PFNS (68259-12-1)	NR70	0.01	<0.01	NA	NA	NA	112	NA
PFDS (335-77-3)	NR70	0.01	<0.01	NA	NA	NA	104	NA
PFOSA (754-91-6)	NR70	0.01	<0.01	NA	NA	NA	104	NA
N-MeFOSA (31506-32-8)	NR70	0.02	<0.02	NA	NA	NA	106	NA
N-EtFOSA (4151-50-2)	NR70	0.02	<0.02	NA	NA	NA	119	NA
N-MeFOSAA (2355-31-9)	NR70	0.01	<0.01	NA	NA	NA	101	NA
N-EtFOSAA (2991-50-6)	NR70	0.01	<0.01	NA	NA	NA	106	NA
N-MeFOSE (24448-09-7)	NR70	0.05	<0.05	NA	NA	NA	110	NA
N-EtFOSE (1691-99-2)	NR70	0.05	<0.05	NA	NA	NA	132	NA
4:2 FTS (757124-72-4)	NR70	0.01	<0.01	NA	NA	NA	109	NA
6:2 FTS (27619-97-2)	NR70	0.01	<0.01	NA	NA	NA	105	NA
8:2 FTS (39108-34-4)	NR70	0.01	<0.01	NA	NA	NA	110	NA
10:2 FTS (120226-60-0)	NR70	0.01	<0.01	NA	NA	NA	100	NA
8:2 diPAP (678-41-1)	NR70	0.02	<0.02	NA	NA	NA	129	NA

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

Signed:

[REDACTED]

Date:

Organics Manager, NMI-North Ryde
14/09/2022



QUALITY ASSURANCE REPORT

Client: [REDACTED]

NMI QA Report No: AECO06/220905

Sample Matrix: Solid

Analyte	Method	LOR	Blank	Sample Duplicates			Recoveries	
		mg/kg	mg/kg	Sample mg/kg	Duplicate mg/kg	RPD %	LCS %	Matrix Spike %
PFBA (375-22-4)	NR70	0.002	<0.002	NA	NA	NA	143	NA
PFPeA (2706-90-3)	NR70	0.002	<0.002	NA	NA	NA	117	NA
PFHxA (307-24-4)	NR70	0.001	<0.001	NA	NA	NA	115	NA
PFHpA (375-85-9)	NR70	0.001	<0.001	NA	NA	NA	112	NA
PFOA (335-67-1)	NR70	0.001	<0.001	NA	NA	NA	115	NA
PFNA (375-95-1)	NR70	0.001	<0.001	NA	NA	NA	119	NA
PFDA (335-76-2)	NR70	0.001	<0.001	NA	NA	NA	113	NA
PFUdA (2058-94-8)	NR70	0.002	<0.002	NA	NA	NA	117	NA
PFDoA (307-55-1)	NR70	0.002	<0.002	NA	NA	NA	120	NA
PFTrDA (72629-94-8)	NR70	0.002	<0.002	NA	NA	NA	116	NA
PFTeDA (376-06-7)	NR70	0.002	<0.002	NA	NA	NA	121	NA
PFHxDA (67905-19-5)	NR70	0.002	<0.002	NA	NA	NA	124	NA
PFODA (16517-11-6)	NR70	0.005	<0.005	NA	NA	NA	107	NA
FOUEA (70887-84-2)	NR70	0.001	<0.001	NA	NA	NA	116	NA
PFBS (375-73-5)	NR70	0.001	<0.001	NA	NA	NA	110	NA
PFPeS (2706-91-4)	NR70	0.001	<0.001	NA	NA	NA	124	NA
PFHxS (355-46-4)	NR70	0.001	<0.001	NA	NA	NA	117	NA
PFHpS (375-92-8)	NR70	0.001	<0.001	NA	NA	NA	119	NA
PFOS (1763-23-1)	NR70	0.002	<0.002	NA	NA	NA	120	NA
PFNS (68259-12-1)	NR70	0.001	<0.001	NA	NA	NA	118	NA
PFDS (335-77-3)	NR70	0.001	<0.001	NA	NA	NA	113	NA
PFOSA (754-91-6)	NR70	0.001	<0.001	NA	NA	NA	114	NA
N-MeFOSA (31506-32-8)	NR70	0.002	<0.002	NA	NA	NA	114	NA
N-EtFOSA (4151-50-2)	NR70	0.002	<0.002	NA	NA	NA	123	NA
N-MeFOSAA (2355-31-9)	NR70	0.002	<0.002	NA	NA	NA	115	NA
N-EtFOSAA(2991-50-6)	NR70	0.002	<0.002	NA	NA	NA	118	NA
N-MeFOSE (24448-09-7)	NR70	0.005	<0.005	NA	NA	NA	117	NA
N-EtFOSE (1691-99-2)	NR70	0.005	<0.005	NA	NA	NA	142	NA
4:2 FTS (757124-72-4)	NR70	0.001	<0.001	NA	NA	NA	121	NA
6:2 FTS (27619-97-2)	NR70	0.001	<0.001	NA	NA	NA	119	NA
8:2 FTS (39108-34-4)	NR70	0.001	<0.001	NA	NA	NA	110	NA
10:2 FTS (120226-60-0)	NR70	0.002	<0.002	NA	NA	NA	118	NA
8:2 diPAP (678-41-1)	NR70	0.002	<0.002	NA	NA	NA	130	NA

Results expressed in percentage (%) or mg/kg wherever appropriate.

Acceptable Spike recovery is 50-150%.

Maximum acceptable RPDs on spikes and duplicates is 40%.

'NA' = Not Applicable.

RPD= Relative Percentage Difference.

Signed:

[REDACTED SIGNATURE]

**Organics Manager, NMI-North Ryde
13/09/2022**

Date:



Australian Government
Department of Industry,
Science and Resources

National Measurement Institute

SAMPLE RECEIPT NOTIFICATION

CUSTOMER DETAILS

Attention: [REDACTED]
Customer: [REDACTED]
Address: LEVEL 8
FORTITUDE VALLEY QLD 4006
Email: [REDACTED]
Telephone:
Fax:

LABORATORY DETAILS

Lab: National Measurement Institute
Contact: [REDACTED]
Address: 105 Delhi Road, North Ryde, NSW
NSW 2113
Email: [REDACTED]
Telephone: 02 9449 0181
Fax:

SAMPLE DETAILS

NMI Job Name: AECO06/220905
Total No. of Samples: 11

LRNs	Estimated Report Date	Customer Sample ID	Lab Sample Description
N22/017409	14-SEP-2022	0229_QC200_220822	SOIL 22/08/22

105 Delhi Road, North Ryde, NSW 2113 Tel: +61 2 9449 0111 www.measurement.gov.au

N a t i o n a l M e a s u r e m e n t I n s t i t u t e

N22/017410	14-SEP-2022	0229_QC201_220822	WATER 22/08/22
N22/017411	14-SEP-2022	0229_QC202_220822	SOIL 22/08/22
N22/017412	14-SEP-2022	0229_QC203_220822	SOIL 22/08/22
N22/017413	14-SEP-2022	0229_QC204_220823	WATER 23/08/22
N22/017414	14-SEP-2022	0229_QC205_220823	SOIL 23/08/22
N22/017415	14-SEP-2022	0229_QC206_220824	WATER 24/08/22
N22/017416	14-SEP-2022	0229_QC207_220824	WATER 24/08/22
N22/017417	14-SEP-2022	0229_QC208_220824	WATER 24/08/22
N22/017418	14-SEP-2022	0229_QC209_220824	WATER 24/08/22
N22/017419	14-SEP-2022	0229_QC501_220902	WATER 02/09/22

SAMPLE RECEIVED CONDITION

Date samples received: 5-SEP-2022

Sample received in good order: Yes

NMI Quotation no. provided: QLD_0229

Client purchase order number: 60612487_3_1

Temperature of samples: Chilled

Comments:

Mode of Delivery: Courier

Additional Terms and Conditions

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

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

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

Appendix F

Calibration Certificates

ANZ

FQM - Water Quality Meter Calibration Record

Q4AN(EV)-410-FM1

Project Name:	PPAS OMP	Project Number:	60612487
Project Location:	TOWNSVILLE	Client:	DEFENCE
PM Name:	[REDACTED]	Fieldwork Staff Name:	[REDACTED]

This calibration record is intended to prompt fieldwork staff to calibrate water quality meter (WQM) daily before the start of fieldworks.

INSTRUMENT DETAILS

Supplier:	AIRMET
Make and Model:	YSI PRO PLUS
Serial Number:	10H100 320

CALIBRATION

CALIBRATE WITH CALIBRATION SOLUTIONS

Date and Time:	26/8/22 12:30				
Parameter	Acidity		Conductivity	ORP.	Dissolved Oxygen
Units	7 pH	4 pH	µS/cm	mV	ppm %
Calibration Standard Concentration:	7.01	4	2760	240	100
Calibration Reading:	6.98	4.04	3072	231.8	120.1
Calibration Temperature:	22.4	22.6	22.8	22.8	21.9

ONGOING CHECKS

BUMP TEST WITH CALIBRATION SOLUTION

Date and Time:					
Parameter	Acidity		Conductivity	Dissolved Oxygen	
Units	pH	pH	µS/cm	ppm	ppm
Calibration Standard Concentration:					
Bump Test Reading:					
Bump Test Temperature:					

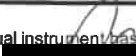
COMMENTS

Detail any equipment faults, minor maintenance performed, change of batteries or technical support provided.

- NO COMMENTS -

Approval and Distribution

Each individual instrument has been inspected and calibrated daily and bump tested as required by fieldwork staff.

 _____
 Fieldwork Staff Signature

 Date

Distribution: Project Central File

ANZ

FQM - Water Quality Meter Calibration Record

Q4AN(EV)-410-FM1

Project Name:	PFAS OMP	Project Number:	60612487
Project Location:	TSV LAVARACK	Client:	DEFENCE
PM Name:	[REDACTED]	Fieldwork Staff Name:	[REDACTED]

This calibration record is intended to prompt fieldwork staff to calibrate water quality meter (WQM) daily before the start of fieldworks.

INSTRUMENT DETAILS

Supplier:	AIRMET
Make and Model:	YSI PROFESSIONAL PLUS
Serial Number:	104100320

CALIBRATION

CALIBRATE WITH CALIBRATION SOLUTIONS

Date and Time:	24/8/22 0700				
Parameter	Acidity		Conductivity	ORP	Dissolved Oxygen
Units	pH 7	pH 4	µS/cm	mV ppm	ppm %
Calibration Standard Concentration:	7	4	2760	240	100
Calibration Reading:	7.02	4.02	2477	236.5	107.6
Calibration Temperature:	18.4	18.2	18.0	18.3	17.8

ONGOING CHECKS

BUMP TEST WITH CALIBRATION SOLUTION

Date and Time:	25/8/22				
Parameter	Acidity		Conductivity	ORP	Dissolved Oxygen
Units	pH 7	pH 4	µS/cm	mV ppm	ppm %
Calibration Standard Concentration:	7.02	4	2760	240	100
Bump Test Reading:	7.09	4.09	2472	241.5	100.6
Bump Test Temperature:	18	18.2	18.0	18.0	16.2

COMMENTS

Detail any equipment faults, minor maintenance performed, change of batteries or technical support provided.

[Empty space for comments]

Approval and Distribution

Each individual instrument has been inspected and calibrated daily and bump tested as required by fieldwork staff.

 Fieldwork Staff Signature

 Date

Distribution: Project Central File

ANZ

FQM - Water Quality Meter Calibration Record

Q4AN(EV)-410-FM1

Project Name:	PFAS OMP	Project Number:	60612487
Project Location:	LAVRACK	Client:	DEFENCE
PM Name:	[REDACTED]	Fieldwork Staff Name:	[REDACTED]

This calibration record is intended to prompt fieldwork staff to calibrate water quality meter (WQM) daily before the start of fieldworks.

INSTRUMENT DETAILS

Supplier:	ARMET
Make and Model:	YSI PRO PLUS
Serial Number:	18L102023

CALIBRATION

CALIBRATE WITH CALIBRATION SOLUTIONS

Date and Time:	22/8/22 0900				
Parameter	Acidity		Conductivity	ORP	Dissolved Oxygen
Units	pH	pH	µS/cm	mV ppm	ppm %
Calibration Standard Concentration:	7.01	4.00	2602	273	100
Calibration Reading:	7.25	4.37	2717	255.6	88.4
Calibration Temperature:	22.3	22.3	22.4	6.8	21.5

ONGOING CHECKS

BUMP TEST WITH CALIBRATION SOLUTION

Date and Time:	23/8/22				
Parameter	Acidity		Conductivity	Dissolved Oxygen	
Units	pH	pH	µS/cm	ORP ppm mV	ppm %
Calibration Standard Concentration:	7	4	2602	229	100
Bump Test Reading:	7.01	4.02	22.5	251.4	99.4
Bump Test Temperature:	22.5	22.5	22.5	22.5	22.5

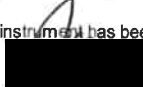
COMMENTS

Detail any equipment faults, minor maintenance performed, change of batteries or technical support provided.

[Empty space for comments]

Approval and Distribution

Each individual instrument has been inspected and calibrated daily and bump tested as required by fieldwork staff.


23 AUG 22

 Fieldwork Staff Signature Date

Distribution: Project Central File

Oil / Water Interface Meter



airmet

Air-Met Scientific Pty Ltd
1300 137 067

Instrument Interface Meter (60M)
Serial No. 312430

Item	Test	Pass	Comments
Battery	Compartment	✓	
	Capacity	✓	
Probe	Cleaned/Decon.	✓	
	Operation	✓	
Connectors	Condition	✓	
		✓	
Tape Check	Cleaned	✓	
	Checked for cuts	✓	
Instrument Test	At surface level	✓	

Certificate of Calibration

This is to certify that the above instrument has been cleaned and tested.

Calibrated by: _____ [Redacted Signature]

Calibration date: 12/08/2022 [Redacted Signature]

Next calibration due: 12/02/2023 [Redacted Signature]

Oil / Water Interface Meter



airmet

Air-Met Scientific Pty Ltd
1300 137 067

Instrument **Interface Meter (30M)**
Serial No. **348897**

Item	Test	Pass	Comments
Battery	Compartment	✓	
	Capacity	✓	
Probe	Cleaned/Decon.	✓	
	Operation	✓	
Connectors	Condition	✓	
		✓	
Tape Check	Cleaned	✓	
	Checked for cuts	✓	
Instrument Test	At surface level	✓	

Certificate of Calibration

This is to certify that the above instrument has been cleaned and tested.

Calibrated by: _____

Calibration date: 12/08/2022

Next calibration due: 12/11/2022

Multi Parameter Water Meter



Instrument YSI Quatro Pro Plus
Serial No. 10H100320

Air-Met Scientific Pty Ltd
1300 137 067

Item	Test	Pass	Comments
Battery	Charge Condition	✓	
	Fuses	✓	
	Capacity	✓	
Switch/keypad	Operation	✓	
Display	Intensity	✓	
	Operation (segments)	✓	
Grill Filter	Condition	✓	
	Seal	✓	
PCB	Condition	✓	
Connectors	Condition	✓	
Sensor	1. pH	✓	
	2. mV	✓	
	3. EC	✓	
	4. D.O	✓	
	5. Temp	✓	
Alarms	Beeper		
	Settings		
Software	Version		
Data logger	Operation		
Download	Operation		
Other tests:			

Certificate of Calibration

This is to certify that the above instrument has been calibrated to the following specifications:

Sensor	Serial no	Standard Solutions	Certified	Solution Bottle Number	Instrument Reading
1. pH 7.00		pH 7.00		393113	pH 7.02
2. pH 4.00		pH 4.00		378672	pH 4.00
3. ORP		240.9mV		377347/374426	240.9mV
4. EC		2760uS		382780	2760uS
5. D.O		0%		111171	0%
6. Temp	901	19.6°C		TestoMini901	19.6°C

Calibrated by:

Calibration date: 17/08/2022

Next calibration due: 17/02/2023

Multi Parameter Water Meter



airmet

Air-Met Scientific Pty Ltd
1300 137 067

Instrument YSI Quatro Pro Plus
Serial No. 18L102023

Item	Test	Pass	Comments
Battery	Charge Condition	✓	
	Fuses	✓	
	Capacity	✓	
Switch/keypad	Operation	✓	
Display	Intensity	✓	
	Operation (segments)	✓	
Grill Filter	Condition	✓	
	Seal	✓	
PCB	Condition	✓	
Connectors	Condition	✓	
Sensor	1. pH	✓	
	2. mV	✓	
	3. EC	✓	
	4. D.O	✓	
	5. Temp	✓	
Alarms	Beeper		
	Settings		
Software	Version		
Data logger	Operation		
Download	Operation		
Other tests:			

Certificate of Calibration

This is to certify that the above instrument has been calibrated to the following specifications:

Sensor	Serial no	Standard Solutions	Certified	Solution Bottle Number	Instrument Reading
1. pH 7.00		pH 7.02	NIST	393113	pH 7.02
2. pH 4.00		pH 4.00	NIST	378672	pH 4.00
3. mV		238.0mV	NIST	377347/374426	238.0mV
4. EC		2760uS	NIST	382780	2761uS
6. D.O		0%	NIST	11171	0%
7. Temp	901	20.9°C	NIST	Testomini901	20.9°C

Calibrated by: [REDACTED]

Calibration date: 11/08/2022 [REDACTED]

Next calibration due: 11/02/2023 [REDACTED]

ANZ

FQM - Water Quality Meter Calibration Record

Q4AN(EV)-410-FM1

Project Name:	PFAS OMP RAAF Base	Project Number:	60612487
Project Location:	Townsville	Client:	Defence
PM Name:	[Redacted]	Fieldwork Staff Name:	[Redacted]

This calibration record is intended to prompt fieldwork staff to calibrate water quality meter (WQM) daily before the start of fieldworks.

INSTRUMENT DETAILS	
Supplier:	-
Make and Model:	Professional Plus
Serial Number:	11C100766

CALIBRATION					
CALIBRATE WITH CALIBRATION SOLUTIONS					
Date and Time:	7 Oct 22 @ 0730				
Parameter	Acidity		Conductivity	Dissolved Oxygen	
Units	pH	pH	µS/cm	ppm (mv)	DO ppm (%)
Calibration Standard Concentration:	4.00	7.00	2760	240.0	100
Calibration Reading:	3.98	7.06	2759	239.9	96.4
Calibration Temperature:	-	-	-	-	-

ONGOING CHECKS					
BUMP TEST WITH CALIBRATION SOLUTION					
Date and Time:					
Parameter	Acidity		Conductivity	Dissolved Oxygen	
Units	pH	pH	µS/cm	ppm	ppm
Calibration Standard Concentration:	 		 	 	
Bump Test Reading:	 		 	 	
Bump Test Temperature:	 		 	 	

COMMENTS					
Detail any equipment faults, minor maintenance performed, change of batteries or technical support provided.					

Approval and Distribution	
<input checked="" type="checkbox"/> Each individual instrument has been inspected and calibrated daily and bump tested as required by fieldwork staff.	
_____ Fieldwork Staff Signature	_____ Date 7/10/22
Distribution: Project Central File	

Wet Season Sampling Factual Report, March 2023

PFAS OMP - Lavarack Barracks Townsville

24-Oct-2023

PFAS Ongoing Monitoring Program - Lavarack Barracks Townsville

Doc No. 60612487_RP92_20231024_LB Wet Season_3

Wet Season Sampling Factual Report, March 2023

PFAS OMP - Lavarack Barracks Townsville

Client: Department of Defence

ABN: 68 706 814 312

Prepared by [REDACTED]

AECOM Australia Pty Ltd

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24-Oct-2023

Job No.: 60612487

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

Quality Information

Document Wet Season Sampling Factual Report, March 2023

Ref 60612487_RP92_20231024_4

Date 24-Oct-2023

Prepared by [REDACTED]

Reviewed by [REDACTED]

Revision History

Rev	Revision Date	Details	Authorised	
			Name/Position	Signature
0	15-Jun-2023	Draft for Review	[REDACTED]	
1	18-Jul-2023	Draft for Review	[REDACTED]	
2	31-Aug-2023	Draft for Review	[REDACTED]	
3	15-Sep-2023	Final Issue	[REDACTED]	
4	24-Oct-2023	Final Issue	[REDACTED]	[REDACTED]

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Abbreviations

Term	Description
6:2 FtS	6:2 Fluorotelomer Sulfonate
AECOM	AECOM Australia Pty Ltd
AFFF	Aqueous film forming foam
ALS	Australian Laboratory Services
ANZG	Australian and New Zealand Guidelines for Fresh and Marine Water Quality (2018)
ASC NEPM	National Environment Protection (Assessment of Site Contamination) Measure, as amended (2013)
BOM	Bureau of Meteorology
DCMM	Defence Contamination Management Manual
Defence	Department of Defence
DO	Dissolved oxygen
DQIs	Data quality indicators
DQOs	Data quality objectives
EC	Electrical conductivity
FOSA	Perfluorooctane sulfonamide
HEPA	Heads of Environmental Protection Agencies
IP	Interface probe
LOR	Limit of reporting
mBTOC	Metres below top of casing
mAHD	Metres Australian Height Datum
NATA	National Association of Testing Authorities
NEMP	National Environmental Management Plan
NHMRC	National Health and Medical Research Council
NMI	National Measurement Institute
OMP	Ongoing Monitoring Plan
ORP	Oxidation-reduction potential
PFAS	Per- and poly-fluoroalkyl substances
PFBA	Perfluorobutanoic acid
PFBS	Perfluorobutane sulfonic acid
PFDODA	Perfluorododecanoic acid
PFHpA	Perfluoroheptanoic acid
PFHpS	Perfluoroheptane sulfonic acid
PFHxA	Perfluorohexanoic acid
PFHxS	Perfluorohexane sulfonic acid
PFOA	Perfluorooctanoic acid
PFOS	Perfluorooctane sulfonate

Term	Description
PFNA	Perfluorononanoic acid
PFPeA	Perfluoropentanoic acid
PFPeS	Perfluoropentane sulfonic acid
PFTrDA	Perfluorotridecanoic acid
PFUnDA	Perfluoroundecanoic acid
PMAP	PFAS Management Area Plan
QA/QC	Quality Assurance/Quality Control
QLD	Queensland
SAQP	Sampling Analysis Quality Plan
SD	Sediment
SW	Surface Water

List of Units

Unit	Definition	Unit	Definition
°C	Degrees Celsius	mg	Milligrams
L	Litre	mm	Millimetre
µS	Microsiemens	cm	Centimetre
kg	Kilogram	mV	Millivolts
m	Metre	µg	Micrograms

1.0 Introduction

1.1 General

AECOM Australia Pty Ltd (AECOM) was engaged by the Department of Defence (Defence) to implement the per- and poly-fluoroalkyl substances (PFAS) Ongoing Monitoring Plan (OMP) outlined in the PFAS Management Area Plan (PMAP) (Department of Defence, 2020) at Lavarack Barracks Townsville (the 'Base') located in the North Queensland Region. The location of the Base and the PFAS Source Areas are shown in **Figure 1** in **Appendix A**. PFAS Source Areas are identified and defined in the PMAP (Department of Defence, 2020). The OMP (Department of Defence, 2020) for Lavarack Barracks includes biannual groundwater, surface water, and sediment sampling events in October 2020, March/April 2021, August 2021, February to April 2022, August to October 2022, and March 2023.

These sampling events were scheduled to include:

- Groundwater sampling of 29 on-Base wells at Lavarack Barracks and nine off-Base wells in the suburbs of Annandale, Idalia, and Wulguru.
- Sediment sampling at 18 on-Base locations at Lavarack Barracks and 13 off-Base locations in the Ross River and waterways in Annandale and Idalia with co-located surface water sampling when water is present.

A Sampling Analysis and Quality Plan (SAQP Rev 7, AECOM, 2023) was prepared to provide details of the sampling event. Where deviations from the SAQP (AECOM, 2023) occurred, these are noted in this report.

This sampling event factual report has been prepared to report the results of the 2023 Wet Season Sampling Event, which was completed from 6 to 15 March 2023. This report specifically highlights first-time detections and/or new exceedances of human health or ecological screening criteria for perfluorooctane sulfonate (PFOS), PFOS + perfluorohexane sulfonic acid (PFHxS) and / or perfluorooctanoic acid (PFOA).

This report has been prepared in accordance with the *PFAS OMP Factual Report Guidance*, v0.2, May 2021 (Department of Defence, 2021).

1.2 Objectives

The objectives of the OMP program are to:

- Implement the OMP prepared as part of the PMAP.
- Collect data that will enable Defence to maintain an up to date understanding of the distribution, concentration, and transport of PFAS at HMAS Cairns and the Former WWII RAN Fuel Installation.

The data collected as part of the scheduled sampling events will assist in the timely identification of risks and inform Defence's approach to the management of PFAS to protect human health and the environment, including updates and revisions to the PMAP.

The objective of this phase of works is to implement the 2023 wet season sampling event scope of works in accordance with the SAQP (AECOM, 2023).

2.0 Scope of Work

The sampling event at the Base was completed in general accordance with the SAQP (AECOM, 2023). In summary, the scope of works for this March 2023 Wet Season sampling event included:

- Review of the SAQP prior to the monitoring event to ensure compliance with relevant Australian guidance and suitable for the proposed sampling.
- Collection of 31 sediment (18 on-Base and 13 off-Base locations) and 29 co-located surface water samples (where water was present) (refer to **Figure 2** and **3, Appendix A**). Collection of groundwater samples at 38 locations including 29 on-Base and 9 off-Base locations.
- Collection of groundwater gauging data (at all 38 wells) and water quality parameter data for surface water and groundwater sample locations (where water was present).
- Analysis of all samples for the PFAS suite (28 analytes) at the standard laboratory limit of reporting (LOR).
- Collection of field duplicate and triplicate samples at a rate of 1 in 10 primary samples, one rinsate sample per fieldwork day, and one trip blank per batch analysed for PFAS suite (28 analytes).
- Data management of all OMP field and laboratory data in the Defence ESdat database.
- Preparation of this Sampling Event Factual Report.

Refer tables below for nominated sampling locations as outlined in the SAQP (AECOM, 2023). Deviations from the SAQP are identified in **Section 3.7**.

Table 1 Planned Groundwater Sampling Locations

Source Area	Monitoring Well ID	Total wells
Eastern PFAS Contamination Area	MW018, MW114, MW115, MW116, MW139	5
Former B Squadron	MW135	1
Former Fire Station	MW105, MW128	2
Former Fire Training Area	MW131	1
Former Helicopter Squadron	MW102	1
Lavarack Golf Course and Sporting Fields	MW065, MW120, MW121, MW122, MW123I, MW123S	6
Monocell	MW072, MW074, MW106	3
Stockpile Designated Area 2	MW141	1
Suspected Aqueous Film Forming Foam (AFFF) Disposal Area	MW101	1
Top, Middle and Lower Dams	MW138	1
Base Boundary – On-Base	MW002, MW003, MW118, MW119, MW124, MW125I, MW125S	7
Sub-total		29
Off-Base	MW205S, MW212, MW217, MW220S, MW226, MW232, MW233, MW235S, MW236S	9
Total		38

Table 2 Planned Surface Water Sampling Locations

Source Area	Surface Water Location ID	Total
Eastern PFAS Contamination Area	SW119, SW121 [^]	2
Former Fire Station	SW109, SW110	2
Lavarack Golf Course & Sporting Field	SW129, SW130	2
Top, Middle and Lower Dams	SW139, SW140, SW144	3
Remaining on-Base	SW113, SW120 [#]	2
Base Boundary	SW126, SW128, SW132, SW133, SW134, SW135, SW136	7
Sub-total		18
Off-Base	SW203, SW205, SW211, SW212, SW217, SW220, SW227, SW232, SW233, SW242, SW243, SW244, SW245	13
Total		31

[#] Location was dry during wet season 2023 sampling event and therefore no sample collected at this location.

[^] Location was inaccessible for surface water sampling during wet season 2023 sampling event and therefore no sample collected at this location due to the presence of vegetation.

Table 3 Planned Sediment Sampling Locations

Source Area	Sediment Location ID	Total
Eastern PFAS Contamination Area	SD119, SD121	2
Former Fire Station	SD109, SD110	2
Lavarack Golf Course and Sporting Fields	SD129, SD130	2
Top, Middle and Lower Dams	SD139, SD140, SD144	3
Remaining on-Base	SD113, SD120	2
Base Boundary	SD126, SD128, SD132, SD133, SD134, SD135, SD136	7
Sub-total		18
Off-Base	SD203, SD205, SD211, SD212, SD217, SD220, SD227, SD232, SD233, SD242, SD243, SD244, SD245	13
Total		31

3.0 Methodology

The methodology used for the 2023 wet season sampling event was in general accordance with the SAQP (AECOM, 2023) and is summarised in **Sections 3.1-3.3**.

3.1 Groundwater Sampling Methodology

The groundwater sampling methodology is outlined in **Table 4** below.

Table 4 Groundwater Sampling Methodology

Item	Details
Groundwater Gauging	The depth to groundwater was measured in each monitoring well prior to the installation of HydraSleeves™ and immediately prior to collection of groundwater samples using an interface probe (IP).
Water Quality Parameters	Temperature, electrical conductivity (EC), dissolved oxygen (DO), oxidation reduction potential (ORP), pH and observations of water quality were recorded using a calibrated water quality meter (results detailed in Table T1). Equipment calibration certificates for the water quality meter are provided in Appendix F .
Sampling Methodology	<p>Groundwater samples were collected from all monitoring wells using no-purge methodology HydraSleeves™, which were installed within the screened interval of each well (based on a review of the well construction log) for a minimum of 24 hours prior to the sampling round (as detailed in Table T1, Appendix B).</p> <p>For wells without available construction details, HydraSleeves™ were installed at the bottom of the well, consistent with the screened interval for wells installed in the same aquifer.</p> <p>HydraSleeves™ were installed based on measured well depth. Review of the provided ESdat well screen interval information indicates that there are discrepancies between documented well screen interval and the actual well depth. Therefore, it appears that the HydraSleeves™ may have been installed outside of the documented screened interval. The SAQP will be amended to include provision for addition of a top weight for the HydraSleeve™ installed in shallow wells to enable the HydraSleeve™ to compress and be filled upon retrieval. This will enable a greater volume of water to be captured by the HydraSleeve™ and to ensure installation within the screened interval.</p> <p>Review of the data and previous results for MW101, MW102, MW106, MW124, MW125I, MW125S, MW205S indicates results are lower than or within the same order of magnitude and water is of similar or comparable condition to previous rounds and therefore considered to be representative of groundwater conditions at these locations.</p>

3.2 Surface Water Sampling Methodology

The surface water sampling methodology is outlined in **Table 5** below.

Table 5 Surface Water Sampling Methodology

Item	Details
Water Quality Parameters	Temperature, electrical conductivity, dissolved oxygen, oxidation reduction potential, pH and observations of water quality were recorded using a calibrated water quality meter. Equipment calibration certificates for the water quality meter are provided in Appendix F .
Sampling Methodology	Samples were collected directly into laboratory supplied containers, from immediately below the water surface, to minimise collection of sediment or floating materials in the samples. Where the waterway could not be accessed from the bank a telescopic sampler with a decontaminated stainless-steel scoop was used to collect the sample. The sample was immediately transferred into new laboratory supplied containers at each sample location.

3.3 Sediment Sampling Methodology

The sediment sampling methodology is outlined in **Table 6** below.

Table 6 Sediment Sampling Methodology

Item	Details
Sampling Methodology	Samples representative of potentially deposited sediments were collected from within the water body (if possible) using a piston sediment sampler or with a trowel from the base of drains (where possible). Samples were collected from the surface of the sediment up to a depth of 0.1 m, where this depth was achievable. At each location, a new laboratory supplied container was used for each sample.
Logging	Sediment characteristics were recorded for each sample.

3.4 Quality Assurance/Quality Control and Analysis

The Quality Assurance/Quality Control (QA/QC) requirements and analysis completed for the OMP sampling event are summarised in **Table 7**, below.

Table 7 QA/QC and Analysis for OMP

Item	Details
QA/QC Samples	Field QA/QC samples collected included intra-laboratory duplicate and inter-laboratory duplicate samples (i.e., splits), trip blank samples and rinsate samples. Intra- and inter-laboratory samples were collected at a rate of one per ten primary samples. Trip blanks were prepared in the laboratory by filling sampling containers with laboratory supplied PFAS-free deionised water and were included at a rate of one per batch of samples (excluding private property sampling). Rinsate samples were collected at a rate of one per day of sampling when non-dedicated equipment was used by pouring laboratory supplied PFAS-free deionised water over the decontaminated sampling equipment. Refer to Appendix C for assessment of QA/QC sample data.

Item	Details
Sample Analysis	<p>All primary samples were submitted for PFAS suite analysis using the standard levels of detection.</p> <p>Australian Laboratory Services (ALS) Environmental Townsville, Queensland (QLD) was used as the primary laboratory. Eurofins Brisbane, QLD was used as the secondary laboratory. ALS and Eurofins methods for the required analyses are certified by the National Association of Testing Authorities (NATA).</p> <p>Chain of Custody Forms are presented in Appendix D. Laboratory certificates are presented in Appendix E.</p>

3.5 Adopted Screening Criteria

Adopted screening criteria references national guidance in the form of the PFAS National Environmental Management Plan (NEMP), Defence estate and environmental strategies, and Defence PFAS-specific strategies and guidance. Guidance documents used to assess the dataset include the following:

- PFAS NEMP, Heads of Environmental Protection Agencies (HEPA) (2020).
- Department of Health, 2019. *Health Based Guidance Values for PFAS for use in site investigations in Australia*. April 2017 [updated September 2019].
- National Health and Medical Research Council (NHMRC), 2019. *Guidance on PFAS in Recreational Water*. August 2019 (NHMRC 2019).
- *National Environment Protection (Assessment of Site Contamination) Measure 1999, Schedule B1, as amended in 2013* (ASC NEPM, 2013).

In accordance with the OMP (Defence, 2020) and SAQP (AECOM, 2023), the adopted PFAS screening criteria to assess the data generated as part of the OMP are presented in **Table 8** below.

Table 8 Summary of Adopted Screening Criteria

Pathway	Compound	Criteria	Comment / Reference
Human Health Receptors			
Drinking Water	PFOS + PFHxS	0.07 µg/L	The values are from the PFAS NEMP (HEPA, 2020). Where the guideline value refers to the sum of PFOS + PFHxS, this includes PFOS only, PFHxS only and the sum of the two (HEPA, 2020). <i>All off base groundwater results will be compared to these criteria as well as one surface water location (SW245) which is within Townsville's emergency drinking water supply.</i>
	PFOA	0.56 µg/L	
Recreational use – surface water	PFOS + PFHxS	2 µg/L	The values are from the PFAS NEMP (HEPA, 2020). <i>All surface water results will be compared to these criteria.</i>
	PFOA	10 µg/L	
Ecological Receptors			
Freshwater and marine water (95% species protection values)	PFOS	0.13 µg/L	The values are from the PFAS NEMP (HEPA, 2020). <i>All surface water and groundwater results will be compared to these criteria.</i>
	PFOA	220 µg/L	

3.6 Data Quality Objectives and Data Validation

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

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

Data validation procedures employed in the assessment of the field and laboratory QA/QC data indicated that the reported analytical results are representative of the sample locations and that the overall quality of the analytical data produced is acceptably reliable for the purpose of this report.

All data collected during March 2023 have been reviewed and uploaded to the Defence ESdat database in accordance with Defence Contamination Management Manual (DCMM) (Defence, 2018 as amended 2021) Annex L requirements.

3.7 Deviations from the SAQP

Table 9 lists the deviations from the SAQP (AECOM, 2023) during this sampling round.

Table 9 Deviations from the SAQP during 2023 Wet Season Sampling Event

SAQP Deviation	Comment/Justification	Impact on Dataset
Collection of surface water at SW120 and SW121	SW120 was noted as dry and couldn't be sampled. SW121 couldn't be sampled due to overgrown vegetation preventing access to water.	Minor – No data available at these locations for wet season 2023. The data set is considered representative of the conditions within the Management Area being monitored.
HydraSleeves™ installed within screened interval	HydraSleeves™ were installed based on measured well depth. Review of the provided ESdat well screen interval information indicates that there are discrepancies between documented well screen interval and the actual well depth. Therefore it appears that the HydraSleeves™ may have been installed outside of the documented screened interval. The SAQP will be amended to include provision for addition of a top weight to shallow wells.	Review of the data and previous results for MW101, MW102, MW106, MW124, MW125I, MW125S, MW205S indicates results are lower than or within the same order of magnitude and water is of similar or comparable condition to previous rounds and therefore considered to be representative of groundwater conditions at these locations.

4.0 Field Observations and Results

The 2023 wet season sampling event was completed between 6 and 15 March 2023.

Details on weather conditions and estate management works or training activities during the sampling event are recorded in **Table 10**.

Table 10 Weather Conditions and Estate Activities at Time of Sampling

Item	Observations
Weather Conditions	<p>The Bureau of Meteorology (BOM) (BOM, 2023) reported the following monthly rainfall data leading up to and during the 2023 wet season sampling event at Bureau Station 032195 Mount Stuart (Defence):</p> <ul style="list-style-type: none"> October 2022: 80.8 mm November 2022: 147.0 mm December 2022: 120.6 mm January 2023: 502.2 mm February 2023: 301.0 mm March 2023: 134.2 mm <p>Weather was overcast and humid with some periods of sun mixed with some periods of heavy rain during the sampling program in March 2023. The conditions monitored were representative of wet season conditions within the Management Area.</p>
Estate Management Works or Training Activities	<p>Soil disturbance activities were identified at the following locations during the sampling event:</p> <ul style="list-style-type: none"> Revegetation and placement of mulch in the area east of the Ergon substation at Andrew Ball Drive. On the corner of Andrew Ball Drive and Gallipoli Drive comprising the stockpiling of soils at the southern end of the Middle Dam. <p>No other estate management works, or training exercises impacted access to sample groundwater, surface water and sediment locations.</p>

The results of the sampling event are summarised in **Sections 4.1-4.3**.

4.1 Groundwater

4.1.1 Observations and Field Measurements

Table 11 Groundwater Observations and Field Measurements

Item	Observations
Access	All monitoring wells were accessible.
Monitoring Well Network	All monitoring wells were observed to be in serviceable condition. MW115 has a bend in the casing approximately 0.75 metres below top of casing (mBTOC) however the well was able to be sampled.
Field Observations	<p>Groundwater from five monitoring wells (MW101, MW115, MW120, MW235S and MW236S) had an organic odour. A weak sulfurous odour was recorded during the sampling of monitoring well MW212.</p> <p>Groundwater colour was typically recorded as clear. Light yellow and yellow coloured groundwater was observed at MW105, MW128 and MW226. Light brown coloured groundwater was observed at MW065, MW072, MW118, MW123I, MW125I, MW135, MW139, MW205S, MW217, MW235S and MW236S. Light grey coloured groundwater was observed at MW115, MW120, MW121 and MW232.</p>

Item	Observations
	<p>Turbidity was typically recorded as low, with medium level turbidity observed at MW115, MW118, MW119, MW205S and MW233.</p> <p>No visible or olfactory indications of contamination were observed during the sampling round.</p> <p>Field observations are presented Table T1 in Appendix B.</p>
Depth to Groundwater	<p>Depth to groundwater ranged between 0.270 (MW232) and 5.125 (MW205S) mBTOC. It is noted that multiple groundwater systems are present across the Management Area. Groundwater elevations within the shallow (alluvial) aquifer were between 1.845 (MW232) and 25.507 (MW141) metres Australian Height Datum (mAHD). Groundwater elevations within the deeper (rock) aquifer were between 8.74 (MW115) and 19.175 (MW106) mAHD. Groundwater gauging data are presented in Table T1 in Appendix B.</p>
Groundwater Flow Direction	<p>Groundwater contours and inferred groundwater flow directions in March 2023 are shown on Figure 4 in Appendix A. The inferred local groundwater flow direction for the shallow aquifer is to the north-east, consistent with previous monitoring rounds. Monitoring wells which are in the deeper aquifer or tidally influenced have been removed from the contours as have wells MW074, MW226, MW105 and MW128 which were identified to have incorrect survey data.</p>
Water Quality Parameters	<p>Groundwater quality parameters were measured at the time of sampling. The readings are presented in Table T1 in Appendix B and are summarised below, covering all sampling completed:</p> <ul style="list-style-type: none"> • DO results ranged between 0.51 mg/L (MW235S) to 6.22 mg/L (MW128) indicating poorly to well oxygenated conditions across the Management Area. • EC ranged from 4.9 µS/cm (MW101) to 35,058 µS/cm (MW232) indicating fresh to saline conditions across the Management Area. • pH ranged from 6.24 (MW220S) to 7.89 (MW065). pH results generally indicated slightly acidic to slightly alkaline conditions across the Management Area. • ORP ranged from 52.5 mV (MW212) to 412.8 mV (MW138) indicating mildly to moderately reducing conditions. • Temperature ranged from 27.0 °C (MW138) to 32.7 °C (MW116). <p>These results are generally consistent with the groundwater quality parameters from the previous five groundwater monitoring rounds since dry season 2020.</p>

4.1.2 Groundwater Analytical Results

Of the 38 groundwater wells sampled during this event, 34 samples reported concentrations of PFAS at or above the laboratory LOR. PFAS was not detected in groundwater at wells MW003, MW124, MW212 and MW235S. The PFAS groundwater analytical results from this sampling event are presented in **Table T2** in **Appendix B**.

There were three first-time detections (PFOS and PFOS + PFHxS – MW233, PFOA – MW123I and MW106) and one new exceedance of the ecological guideline (PFOS – MW106) during the sampling. Four of the nine samples collected off-Base and a total of 26 on-Base and boundary samples, exceeded the adopted ecological guideline for PFOS. Four of the nine samples collected off-Base and a total of 26 on-Base and boundary samples exceeded the human health drinking water guideline for PFOS+PFHxS. No off-Base and a total of six on-Base samples exceeded the PFOA human health drinking water guideline. There were no on- or off-Base exceedances of the PFOA ecological guideline.

The following historical maximum concentrations were recorded during the March 2023 sampling round:

On-Base

- PFOS, PFOA, PFOS+PFHxS at MW114
- PFOS, PFOA, PFOS+PFHxS at MW131
- PFOS, PFOS+PFHxS at MW121
- PFOA, PFOS+PFHxS at MW123I
- PFOS, PFOA, PFOS+PFHxS at MW106
- PFOA, PFOS+PFHxS at MW138.

Off-Base

- PFOS and PFOS+PFHxS at MW233 which were detected for the first-time.

Historical groundwater results are presented in **Table T7, Appendix B**.

Groundwater sampling results were generally within the same order of magnitude as historically reported concentrations.

4.2 Surface Water

4.2.1 Observations and Field Measurements

Table 12 Surface Water Observations and Field Measurements

Item	Observations
Access	All surface water locations were accessible during the March 2023 sampling event with the exception of the following which couldn't be sampled: <ul style="list-style-type: none"> • SW121 was inaccessible for collection of surface water only. • SW120 was dry.
Field Observations	Surface water at SW232 exhibited a slight biological sheen on the surface. Surface water on-Base was observed to be generally clear. Light brown coloured surface water was observed at one on-Base location (SW134), and light brown, brown, light yellow and light olive/brown coloured surface water was observed at the majority of off-Base locations. No other visible or olfactory indications of contamination were observed during the sampling of the surface water locations. Field observations are presented Table T3 in Appendix B .
Water Quality Parameters	Surface water quality parameters were measured at the time of sampling. Readings are presented in Table T3 in Appendix B and are summarised below: <ul style="list-style-type: none"> • DO results ranged between 2.14 mg/L (SW220) and 9.35 mg/L (SW212) indicating moderately to well oxygenated conditions. • EC ranged from 3.1 µS/cm (SW134) 10,695 µS/cm (SW243) indicating relatively fresh conditions in urban runoff areas and saline conditions in areas with tidal connectivity. • pH ranged from 6.42 (SW220) to 8.88 (SW135). pH results generally indicated slightly acidic to slightly alkaline conditions. • ORP ranged from 180.9 mV (SW205) to 415.3 mV (SW110) indicating mildly to moderately reducing conditions. • Temperature ranged from 26.6°C (SW109) to 32.6°C (SW119).

4.2.2 PFAS Surface Water Analytical Results

Of the 29 surface water samples collected, 24 reported concentrations of PFAS above the laboratory LOR. The PFAS surface water analytical results from this sampling event are presented in **Table T4** in **Appendix B**. There was one first-time detection of PFOA at SW133 and no new exceedances of PFOS, PFOA or sum of PFOS+PFHxS.

PFOS concentrations in 11 on-Base samples and four off-Base samples exceeded the adopted ecological guidelines for PFOS. Two on-Base samples exceeded the human health drinking water guideline for PFOA. Sum of PFOS+PFHxS concentrations in all 14 on-Base samples and nine off-Base samples exceeded the human health drinking water guideline and two on-Base samples exceeded the human health recreational guideline.

The following historical maximum concentrations were recorded during the March 2023 sampling round:

On-Base

- PFOS, PFOA and PFOS+PFHxS at SW110
- PFOA at SW129
- PFOS at SW144
- PFOS and PFOS+PFHxS at SW133.

Off-Base

- PFOS, PFOA and PFOS+PFHxS at SW203
- PFOS and PFOS+PFHxS at SW205
- PFOS+PFHxS at SW211
- PFOS+PFHxS at SW217
- PFOS+PFHxS at SW232
- PFOS, PFOA and PFOS+PFHxS at SW233
- PFOS and PFOS+PFHxS at SW242.

Historical surface water results are presented in **Table T8, Appendix B**.

4.3 Sediment

4.3.1 Observations and Field Measurements

Table 13 Sediment Observations

Item	Observations
Access	During the March 2023 sampling event, sediment was collected at all 31 sampling locations.
Field Observations	No visible or olfactory indications of contamination were observed during the sampling of the sediment locations. Sediment logging and observation data are presented in Table T5, Appendix B .

4.3.2 PFAS Sediment Analytical Results

Of the 31 sediment samples collected, 17 on-Base and nine off-Base samples reported concentrations of PFAS above the laboratory LOR. There are no endorsed human health or ecological guideline values available for sediment. The PFAS sediment analytical results from this sampling event are presented in **Table T6** in **Appendix B**.

There were two first-time detections of PFOA at on-Base sediment locations (SD144 and SD128). There were no new exceedances PFOS, PFOA or sum of PFOS+PFHxS as there are currently no sediment guidelines for PFAS.

The following locations recorded historical maximum concentrations during the March 2023 sampling round:

On-Base

- PFOS and PFOS+PFHxS at SD121
- PFOS and PFOS+PFHxS at SD133
- PFOA and PFOS+PFHxS at SD139
- PFOA at SD144
- PFOS and PFOS+PFHxS at SD120
- PFOS, PFOA and PFOS+PFHxS at SD128.

Off-Base

- PFOS and PFOS+PFHxS at SD232.

Historical sediment results are presented in **Table T9, Appendix B**.

5.0 Summary and Next Sampling Event

5.1 Summary of Sampling Event

The routine OMP Wet Season Sampling Event was undertaken at the Base between 6 and 15 March 2023. This wet season sampling event included sampling from 38 groundwater monitoring locations, 29 surface water monitoring locations and 31 sediment monitoring locations.

Table 14 summarises the findings of the March 2023 sampling events and the recommended actions.

Table 14 Summary of Sampling Event

Item	Comment	Recommended Actions
<u>Access to sampling locations</u>	All groundwater monitoring wells, surface water and sediment locations were accessible during the dry season monitoring event, with the exception of SW121 which was unable to be accessed due to overgrown vegetation in the waterway limiting access for surface water sampling.	Ongoing monitoring in accordance with the OMP.
<u>Groundwater: Installation of HydraSleeves™</u>	HydraSleeves™ were installed outside of documented screened interval at for MW101, MW102, MW106, MW124, MW125I, MW125S, MW205S	SAQP will be amended to include provision for addition of a top weight to shallow wells.
<u>Surface Water:</u> Dry/insufficient water to sample	During the March 2023 sampling event, surface water was not present at one monitoring location, SW120.	Ongoing monitoring in accordance with the OMP. Review all sampling locations to assess constraints in matrix availability, with specific review of location SW120.
<u>Analytical Results</u>	PFAS were detected at or above the laboratory LOR in 34 of the 38 groundwater samples, 24 of the 29 surface water samples and 26 of the 31 sediment samples analysed.	Ongoing monitoring in accordance with the OMP.
<u>First-time detections and new exceedances.</u>	<u>Groundwater:</u> there were three first-time detections of PFOS, PFOS+PFHxS and PFOA and one new exceedance of the ecological guideline for PFOS. <u>Surface water:</u> there was one first-time detection of PFOA and no new exceedances. <u>Sediment:</u> there were two first time detections of PFOA and no new exceedances.	Ongoing monitoring in accordance with the OMP.

5.2 Upcoming Sampling Events

The next biannual sampling event is scheduled for August 2023.

5.3 Upcoming Annual Interpretive Report

The next annual interpretive report is scheduled for March 2024. The March 2023 event will be included in the upcoming ongoing monitoring interpretive report for the monitoring conducted between October 2020 and March 2023.

6.0 References

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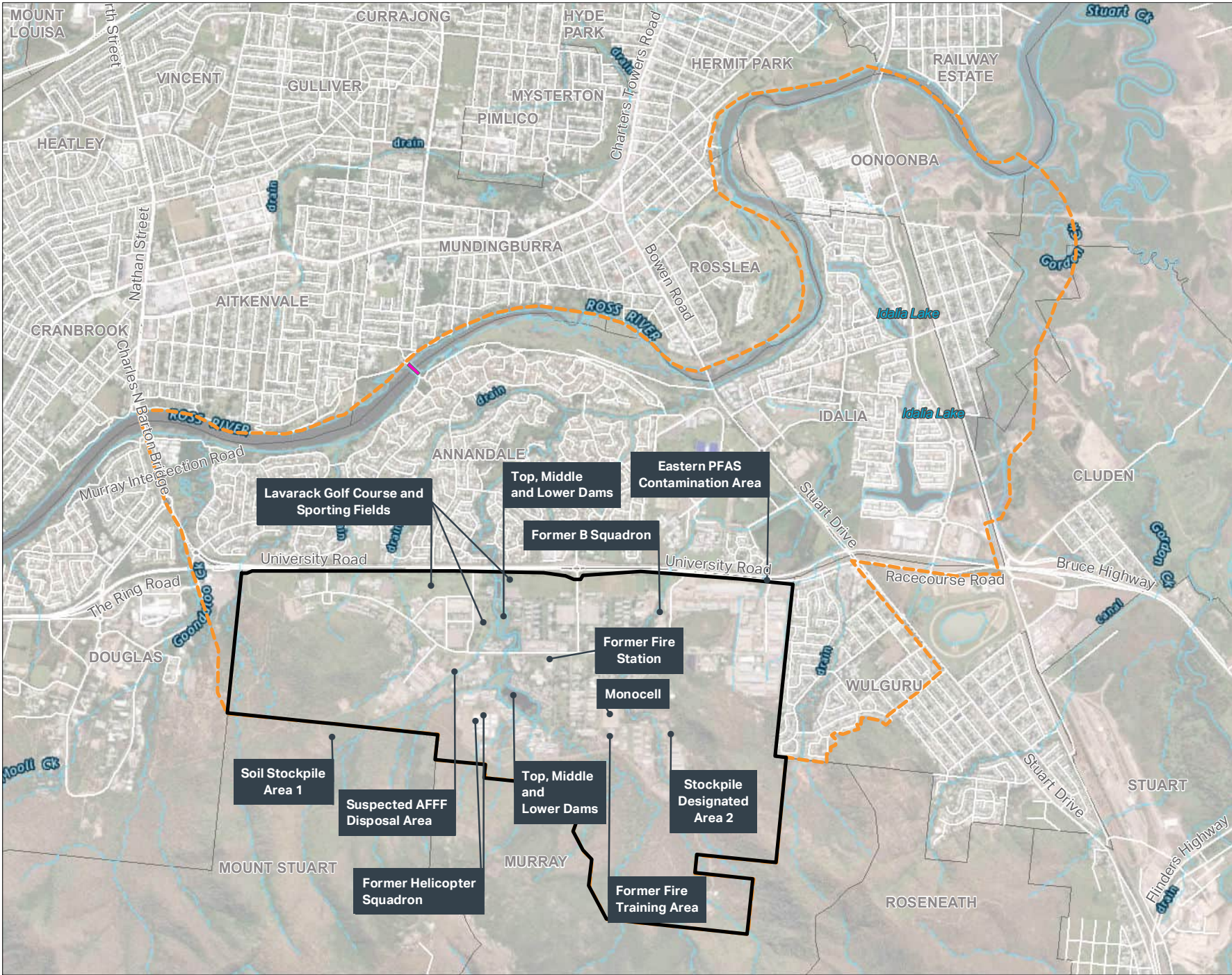
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Standards Australia. (1998). AS/NZS 5667.11–1998: Water Quality - Sampling - Guidance on Sampling of Groundwaters.

Appendix A

Figures



Legend

- Base Boundary
- Management Area
- Aplin's Weir
- Source Areas
- Watercourses

FIGURE 1: LAVARACK BARRACKS LOCATION AND SOURCE AREAS

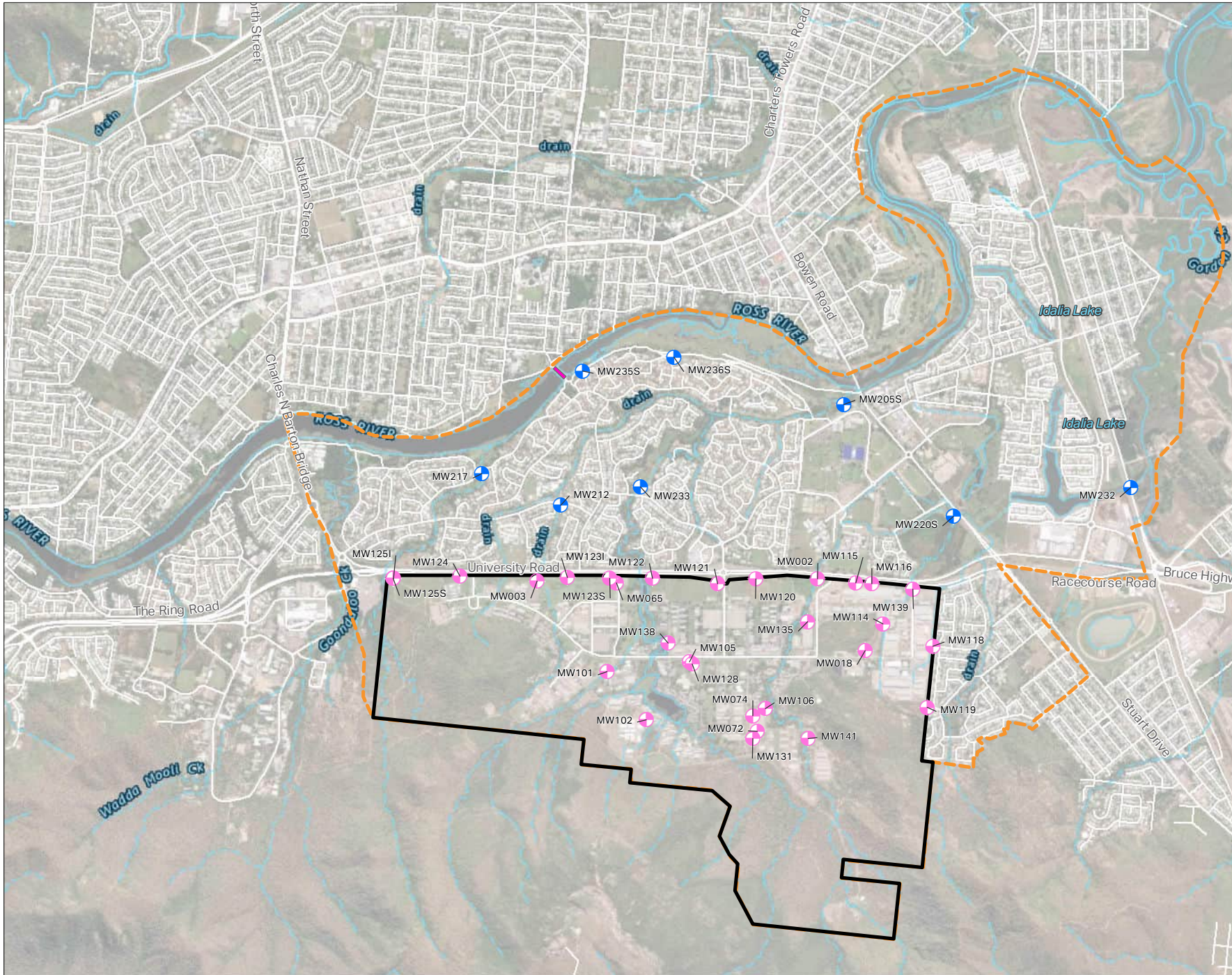
PROJECT NAME:
PFAS OMP
REPORT NAME:
PFAS OMP – Lavarack Barracks (0229) Townsville, Wet Season Sampling Factual Report March 2023
CLIENT NAME:
Department of Defence
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Legend

- Property Boundary
- Management Area
- Aplin's Weir
- Source Areas
- Watercourses
- On-Base Monitoring Well
- Off-Base Monitoring Well



**FIGURE 2:
GROUNDWATER
MONITORING LOCATIONS**

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PFAS OMP
REPORT NAME:
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(0229) Townsville,
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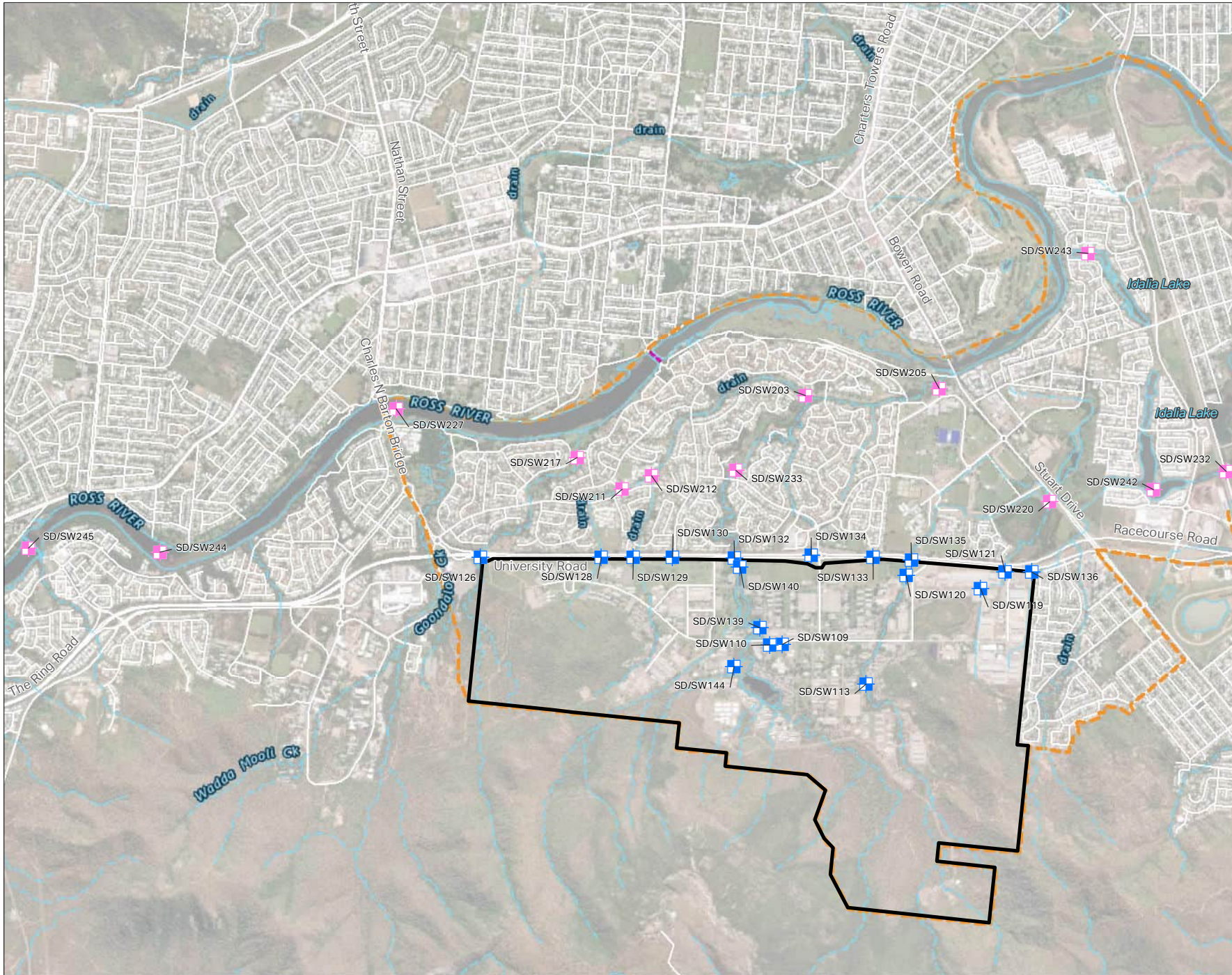
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Legend

- Property Boundary
- Management Area
- Aplin's Weir
- Source Areas
- Watercourses
- On-Base Co-located Surface Water and Sediment Sample Location
- Off-Base Co-located Surface Water and Sediment Sample Location



**FIGURE 3:
SURFACE WATER AND
SEDIMENT MONITORING
LOCATIONS**

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Legend

- Property Boundary
- Management Area
- Aplin's Weir
- Watercourses
- Groundwater Contour
- Inferred Groundwater Flow Direction
- Off-Base Monitoring Well
- On-Base Monitoring Well

Note: All elevations are in m AHD. Some elevations were unable to be plotted due to a data error

FIGURE 4: INFERRED GROUNDWATER CONTOURS- SHALLOW AQUIFER (ALLUVIUM) WET SEASON

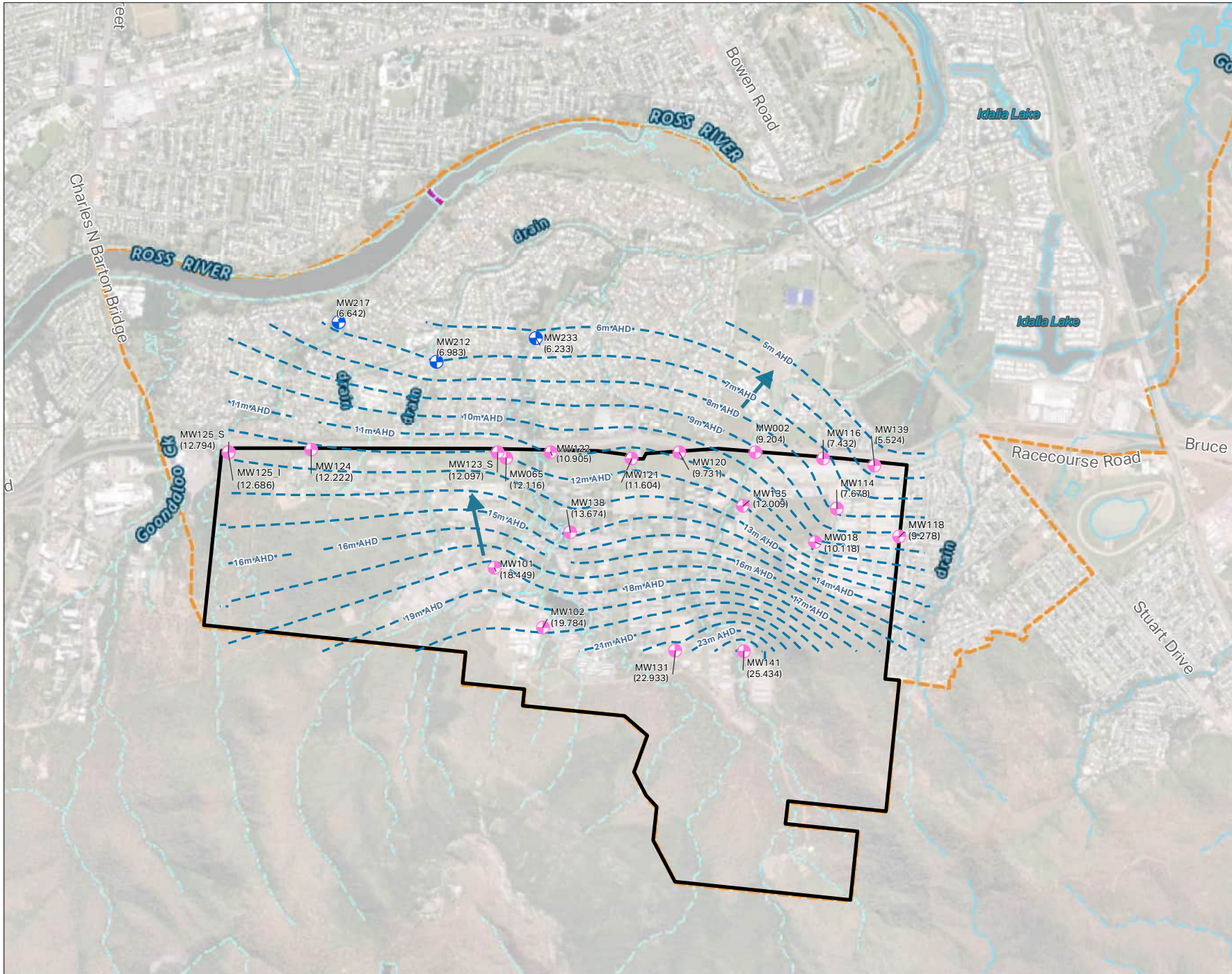
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REPORT NAME:
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Legend

Management Area

Sub-Management Area Boundary

Aplin's Weir

First time detection of PFOS + PFHxS, PFOS or PFOA

New exceedance of the ecological guideline for PFOS

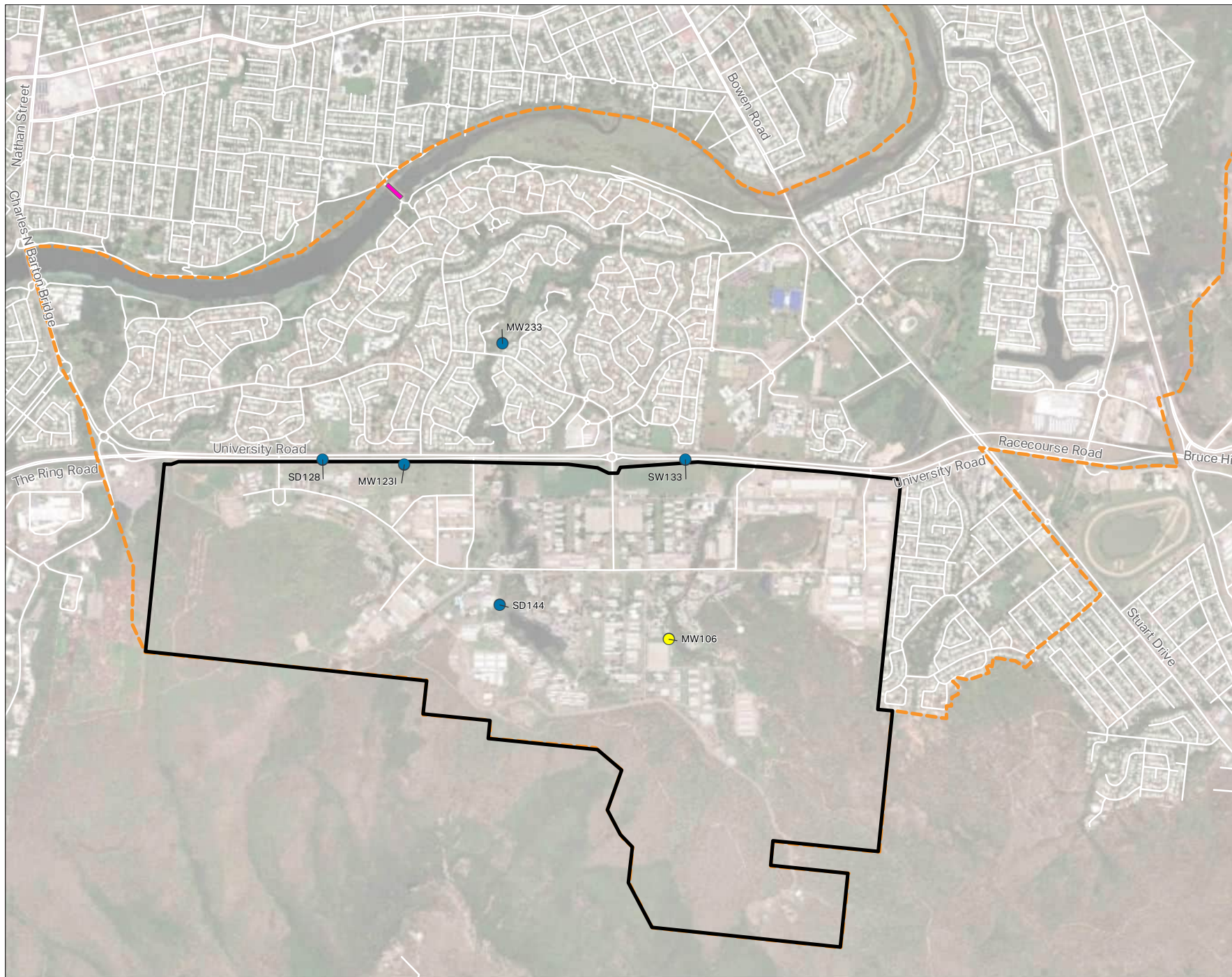


FIGURE 5:
FIRST-TIME DETECTIONS
OR NEW EXCEEDANCES
OF PFOS + PFHXS,
PFOS OR PFOA

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Appendix B

Analytical Tables

Table T2: Groundwater PFAS Analytical Results

PFAS Full Suite table with columns for various PFAS compounds (e.g., PFOA, PFOS, PFNA, PFHxS) and their concentrations in ug/L. Includes summary rows for LOR and PFAS NEMP 2020 limits.

Main data table with columns: Location, Sample ID, Source Zone, Sampled Date, and 33 PFAS analytes. Rows are grouped by site: Eastern PFAS Contamination Area, Former B Squadron, Former Fire Station, Former Fire Training Area, Former Helicopter Squadron, Lavarack Golf Course & Sporting Field, Monocell, Stockpile Designated Area 2, Suspected AFFF Disposal Area, Top, Middle and Lower Dams, Base Boundary, and Off-Base.

LOR is limit of reporting ug/L is micrograms per litre # denotes disturbance to the well may have impacted sample integrity < denotes concentration is less than PFAS NEMP 2020 Drinking Water guideline applied to off-Base monitoring wells only. Heads of Environmental Protection Agencies (HEPA), (2020). PFAS National Environmental Management Plan (NEMP). Denotes first time detection above LOR Denotes new exceedance of guideline values

Location Code	Sample Date	DO mg/L	EC µS/cm	pH	Redox (mV)	Corrected Redox (mV)	Temp (°C)	Turbidity	Water Colour	Odour	Sheen	Comments
Eastern PFAS Contamination Area												
SW119	10/03/2023	7.23	714	7.23	176.0	370.0	32.6	Low	Clear	No odour	No sheen	
SW121	6/03/2023									No water available for sampling due to thick vegetation.		
Former Fire Station												
SW109	6/03/2023	7.96	16.4	8.03	58.6	252.6	26.6	Low	Clear	No odour	No sheen	No flow, in man made drain
SW110	15/03/2023	6.1	2568	7.33	221.3	415.3	28.6	Low	Brown	No odour	Biosheen	Earthen drain, water depth approx 5cm, channel full of reeds
Lavarack Golf Course & Sporting Field												
SW129	6/03/2023	5.28	948	8.59	43.0	237.0	28.7	Low	Clear	No odour	No sheen	Bubbles on surface, tad poles observed, drain slight flow
SW130	8/03/2023	6.41	275.3	7.15	153.1	347.1	27.2	Low	Clear	No odour	No sheen	Highly vegetated - low flow
Top, Middle and Lower Dams												
SW139	6/03/2023	3.61	462.4	7.37	62.2	256.2	28.2	Low	Clear	No odour	No sheen	Leafy bottom, side of lake, no flow
SW140	6/03/2023	4.42	343.7	7.21	53.9	247.9	27.8	Low	Clear	No odour	No sheen	On dam wall, low flow, lots of fish
SW144	10/03/2023	2.65	247	6.86	124.0	318.0	31.5	Low	-	No odour	No sheen	
Base Boundary												
SW126	8/03/2023	6.93	51.4	7.25	100.1	294.1	27.8	Low	Clear	No odour	None reported	Fast flowing, 4m wide 1cm deep
SW128	6/03/2023	8.99	509.4	7.81	59.4	253.4	27.2	Low	Clear	No odour	No sheen	Clay lined culvert, low flow, some green algae
SW132	6/03/2023	2.98	423.3	7.14	46.5	240.5	28.8	Low	Clear	No odour	No sheen	High flow, gravel culvert from lake
SW133	6/03/2023	4.46	567	7.58	51.6	245.6	26.8	Low	Clear	No odour	No sheen	Slow flow in culvert
SW134	8/03/2023	4.84	3.1	7.04	144.0	338.0	27.1	Low	Light brown	No odour	No sheen	Drain 1 m wide, <5cm deep water, low flow
SW135	6/03/2023	2.4	2660	8.88	74.3	268.3	29	Low	Clear	No odour	No sheen	Drainage channel, minimal flow, 4m wide, 5 cms deep
SW136	6/03/2023	4.45	925	8.2	141.8	335.8	28.5	Low	Clear	No odour	No sheen	Drainage course, medium flow rate, 5 cm deep, 0.5m wide
Remaining On-Base												
SW113	10/03/2023	7.79	417.3	7.74	84.4	278.4	31.9	Low	Clear	No odour	No sheen	
SW120	10/03/2023									Location was dry		
Off-Base												
SW203	6/03/2023	6.07	762	6.97	49.2	243.2	28.8	Low	Light Brown	No odour	No sheen	Creek, 2 m wide, 0.2 m deep. Slow flow observed
SW205	9/03/2023	3.26	1435	7.69	-13.1	180.9	27.6	Medium	Light Brown	No odour	No sheen	River, 10 m wide, depth unknown, slow flow observed
SW211	9/03/2023	4.61	1067	7.53	9.0	203.0	29.7	Low	Light Brown	No odour	No sheen	drainage creek, 1 m wide, 0.1m deep, no flow observed
SW212	9/03/2023	9.35	1244	8.76	27.8	221.8	29.1	Low	Light Yellow	No odour	No sheen	concrete drain, low flow, 4 m, 0.05m deep
SW217	6/03/2023	6.79	1399	7.49	136.4	330.4	28.4	Low	Brown	No odour	No sheen	Drainage channel, 2m wide, 0.3m deep, slow flow
SW220	9/03/2023	2.14	648	6.42	199.3	393.3	26.7	Low	Brown	No odour	No sheen	Drainage channel, 2m wide, 0.3m deep, slow flow
SW227	8/03/2023	5	169.5	7.86	93.1	287.1	30.3		Clear	Nil	None reported	Slow flow under bridge
SW232	9/03/2023	2.75	4083	8.16	53.6	247.6	28.9	Medium	Light Brown	No odour	Biosheen	Creek, 3 m wide, 1 m deep, slow flow observed
SW233	6/03/2023	3.89	695	7.16	123.7	317.7	27.8	Low	Light Olive/Brown	No odour	No sheen	Creek, 5 m wide, 0.7 m deep, low flow observed
SW242	9/03/2023	3.74	1674	8.2	114.9	308.9	28.1	Medium	Light Brown	No odour	No sheen	Lake, 200m wide, 50 m wide, no flow observed
SW243	9/03/2023	3.55	10695	7.98	16.0	210.0	29.2	Low	Light yellow	No odour	No sheen	
SW244	8/03/2023	4.49	150.4	7.6	32.9	226.9	30.3	Low	Clear	No odour	No sheen	Slow flow just above weir
SW245	8/03/2023	5.1	185.9	7.18	169.3	363.3	29.3	Low	Brown	No odour	No sheen	Slow flow just above weir

Table T5: Sediment Observation Results

Location ID	Date	Sample Description	Odour	Comment
Eastern PFAS Contamination Area				
SD119	10/03/2023	Sand, loose, brown/black, fine grained, subangular, moist	N	Some surface algae
SD121	6/03/2023	Silty CLAY, brown, med plasticity, with trace of sand	N	Plant roots and surface algae
Former Fire Station				
SD109	6/03/2023	SAND, brown, medium grained, poorly graded, wet	N	Nil
SD110	6/03/2023	Sandy CLAY, brown, low plasticity, firm, moist	N	Nil
Lavarack Golf Course & Sporting Field				
SD129	6/08/2023	CLAY, pale brown grey, low plasticity, wet	N	Low flow
SD130	8/03/2023	SAND, brown, medium grained, with gravel, wet, with algae	N	High organic content
Top, Middle and Lower Dams				
SD139	6/03/2023	Sandy CLAY, brown, low plasticity, firm, dry	N	Nil
SD140	6/03/2023	silty SAND, brown, medium grained, poorly graded, dry	N	High root content
SD144	10/03/2023	CLAY, soft, dark brown, low plasticity, fine grained, subrounded sand, moist	N	Some organic content (leaves)
Remaining On-Base				
SD113	9/03/2023	gravelly SAND, well graded with sub rounded gravel	N	Low organic matter
SD120	9/03/2023	gravelly SAND, well graded, medium grained, some medium angular to subangular gravel, brown to yellow	N	Minor organic material in sample
Base Boundary				
SD126	8/03/2023	SAND, yellow, medium grained, poorly graded, with trace subangular gravel, wet	N	Nil
SD128	9/03/2023	CLAY, grey, low plasticity, firm, wet	N	Organic content (roots), location was dry
SD132	6/03/2023	SAND, brown, medium to large grained, well graded, wet	N	Low organic content. Slow flow
SD133	8/03/2023	Sandy CLAY, brown, low plasticity, wet	N	Nil
SD134	8/03/2023	Silty SAND, brown, medium grained, wet	N	Low organic content
SD135	6/03/2023	SAND, brown yellow, medium grained, poorly graded, wet	N	Nil
SD136	6/03/2023	SAND, yellow brown, medium grained, poorly graded, wet	N	Nil
Off-Base				
SD203	8/03/2023	SAND, loose, light brown, medium grained, wet	N	Nil
SD205	9/03/2023	CLAY, loose, grey, small fine gravel, low plasticity	N	Low organic matter
SD211	9/03/2023	gravelly CLAY, brown, low plasticity, firm. Wet	N	No flow
SD212	9/03/2023	SAND, yellow, fine grained sand, poorly graded, wet	N	Low flow
SD217	8/03/2023	sandy CLAY, firm, dark brown to black, fine grained sand, wet	N	Organic content (roots and leaves)
SD220	9/03/2023	CLAY, grey, high plasticity, wet	N	Low organic matter, low flow
SD227	8/03/2023	CLAY, fine, brown, small amounts of gravel and sand	N	Nil
SD232	9/03/2023	CLAY, loose, grey, low plasticity, medium sized gravel	N	Some organic content
SD233	15/03/2023	SAND, loose to medium dense, brown, fine to medium grained, subangular, with clay	N	Organic content (tree and grass roots)
SD242	9/03/2023	CLAY, light grey, fine sand, high plasticity	N	Nil
SD243	9/03/2023	CLAY, firm, dark grey, medium fine sand/gravel	N	Low organic matter
SD244	8/03/2023	gravelly SAND, loose, brown, fine to medium gravel/sand	N	Nil
SD245	8/03/2023	CLAY, brown, firm, wet	N	High organic content

Table with columns for Location ID, Sample Date, and various PFAS compounds (e.g., 4:2 FTS, 6:2 FTS, 8:2 FTS, 10:2 FTS, EFOSA, EFOSAA, EFOSE, FOSA, MeFOA, MFOSA, MeFOSE, PFBS, PFPs, PFHs, PFHs, PFOS, PFDS, PFBA, PFHA, PFPA, PFHpA, PFOA, PFDA, PFDoA, PFNA, PFToA, PFTDA, PFUnA, Sum of FOS and PFHs, Sum of PFAS). Rows include monitoring wells MW118, MW119, MW124, MW125I, MW125S, Off-Base, MW205S, MW212, MW217, and MW220S with data points for each compound over time.

Table with columns for chemical species (4:2 FTS, 6:2 FTS, etc.) and rows for various locations (SW 144, SW 113, SW 120, SW 126, SW 128, SW 132, SW 133, SW 134, SW 135, SW 136) with sample dates and concentrations in μg/L.

Table T8: Historical Surface Water PFAS Analytical Results

Summary table with columns for PFAS compounds (FTS, FOS, MeFOSA, etc.) and rows for regulatory standards (NHMRC, PFAS NEMP 2020) and a total sum of PFOS and PFHxS.

Main data table with columns for Location ID, Sample Date, and 28 PFAS compounds. Data is grouped by location ID (SW203, SW205, SW211, SW212, SW217, SW220, SW227) and includes individual analytical results and summary statistics.

Table T9: Historical Sediment PFAS Analytical Results

Table with columns for chemical species (4:2 FTS, 6:2 FTS, etc.) and units (mg/kg, LOR). Rows include chemical names and their corresponding units.

Location ID Sample Date

Main data table with columns for Location ID, Sample Date, and various chemical species. Rows are grouped by location: Eastern PFAS Contamination Area, Former Fire Station, Lavarack Golf Course and Sporting Fields, and Top, Middle and Lower Dams.

Table T9: Historical Sediment PFAS Analytical Results

Table with 28 columns for chemical compounds (4:2 FTS, 6:2 FTS, 8:2 FTS, 10:2 FTS, EFOSA, EFOSAA, EFOSE, FOSA, MeFOSA, MFOSAA, MeFOSE, PFBS, PPFs, PFHxS, PFHpS, PFOS, PFDS, PFBA, PFHxA, PPFxA, PFHpA, PFOA, PFDA, PFDaDA, PFNA, PFTeDA, PFTrDA, PFUnDA, Sum of PFHxS and PFOS, Sum of PFAS) and 2 rows for units (mg/kg) and location (LOR).

Main data table with columns for Location ID, Sample Date, and 28 chemical compounds. Rows include locations SD144, SD113, SD120, SD126, SD128, SD132, SD135, SD136, SD203, SD205, and SD211, each with multiple sampling dates and corresponding concentration values.

Appendix C

Data Validation

DATA VALIDATION REPORT

Project No.:	60612487	Validation by: [REDACTED]	Date: 19/4/2023
Client:	Department of Defence		
Site:	Lavarack Barracks (0229)		
Matrix type:	Groundwater, surface water, sediment	Data verified by: [REDACTED]	Date: 3/05/2023
No. of primary samples:	38 groundwater, 29 surface water, 32 sediment.		
Laboratory:	ALS (Townsville), Eurofins (Brisbane)	Project Manager: [REDACTED]	
Lab reference:	ET2301427, ET2301428, ET2301429, ET2301455, 972979		
Key Issues:	No QA/QC issues were identified in the field or laboratory datasets that could have a material implication on data interpretation and therefore decision-making on the project. The data are considered appropriate for use to meet the project objectives.		
Field QA/QC			
Sampling personnel	Sampling was conducted by AECOM personnel from 6 March to 15 March 2023.		
Sampling Methodology	Groundwater, surface water and sediment samples were collected using appropriate methods as identified within the main body of the report. Hydrasleeves were installed in the well for a minimum of 24 hours prior to collection. Surface water samples were collected from immediately below the water surface. Sediment samples were collected from within the water body, where possible.		
Chain of Custody (COC)	COC documents completed as per AECOM procedures.		
Rinsate Blank	Rinsate blank samples were collected at a frequency of one per field staff per day of sampling (nine in total). Rinsate blanks were collected for each sample matrix from equipment including an interface probe, surface water sampling cup and trowel. Concentrations of all analytes tested were reported below the LOR for rinsate samples.		
Trip blanks	Trip blanks were not included in the samples sent to the laboratory. This was an oversight of the sampling team.		
Eskies to Laboratory	A total of eight eskies of samples in four deliveries were submitted to ALS and one esky was submitted to Eurofins across the March 2023 sampling event.		
Frequency of field QC	Field duplicates (intra-laboratory duplicates) and triplicates (inter-laboratory duplicates) at the following frequencies: <ul style="list-style-type: none"> • Four duplicates and four triplicates for groundwater (10.5%) • Four duplicates and four triplicate for surface water (13%) • Four duplicates and four triplicate for sediment (12.5%) <p>The target frequency of 10% for field duplicates and triplicates was achieved for all groundwater, surface water and sediment samples collected in this program. The reported frequency of field QC reporting is considered suitable for the purpose of this assessment.</p>		
Handling and preservation	Primary, duplicate and triplicate samples were received preserved and chilled at the laboratory. Sample receipt temperature was reported between 3.0°C and 12.1°C with ice present or attempt to chill the samples notes been made. All samples were received at the laboratory in appropriate sample containers with no sample container / preservation non-compliances noted.		

Equipment Calibration	Calibration of the water quality meter was conducted by the equipment hire company and at the beginning of each sampling day, see Appendix F .
Laboratory QA/QC	
Tests requested/reported	Samples were analysed and reported as requested on the COC.
Holding time compliance	Samples were extracted and analysed within recommended holding times.
Laboratory Accreditation	The laboratory analysis was conducted by ALS Environmental Pty Ltd (Townsville) a National Association of Testing Authorities (NATA) accredited laboratory. The triplicate samples were analysed at the Eurofins (Brisbane), also a NATA accredited laboratory.
Frequency of laboratory QC	<p>The laboratory reported sufficient frequency of quality control samples to assess whether the results have been reported to an acceptable accuracy and precision, except:</p> <ul style="list-style-type: none"> • Laboratory duplicates for PFAS in water were below the expected rate of 10% in ET2301455 (at 7.14%). • Matrix spikes for PFAS in water were below the expected rate of 5% in ET2301455 (3.57%). <p>Sufficient additional sample was provided to the laboratory to enable the analysis. The additional sample volume was not assigned by the laboratory system. AECOM are working with the laboratory to amend this issue going forwards.</p>
Method Blank	No method blank value outliers were reported.
Laboratory duplicate RPDs	Laboratory duplicate Relative Percentage Differences (RPD) were within control limits for all samples analysed.
Laboratory control spike (LCS) recovery	All LCS recoveries were reported within acceptable limits.
Matrix spike recovery	<p>All matrix spike (MS) recoveries were within control limits, except:</p> <ul style="list-style-type: none"> • ET2301429: 0229_MW114_2300309 – Perfluorohexane sulfonic acid (PFHxS) and Perfluorohexanoic acid (PFHxA) (reported MS spike recovery not determined, background level greater than or equal to 4 x spike level). • ET2301455: Anonymous Sample – Perfluorooctane sulfonic acid (PFOS) (reported MS spike recovery not determined, background level greater than or equal to 4 x spike level).
Surrogate spike recovery	Laboratory surrogate spike recoveries were reported to all be within control limits.

QA/QC Field Data Evaluation

Comparison of Field Observations and Laboratory Results	No anomalous results between field observations and analysis results were noted.
Data transcription	A random 10% check of the laboratory results identified no anomalies within the electronic data, the laboratory reports, and tables generated by AECOM.
Limits of reporting	Limits of Reporting (LORs) were sufficiently low to enable assessment against adopted screening levels.
Field duplicate RPDs	<p>Field duplicate RPDs were reported within control limits except (the sample with the higher concentration is in bold):</p> <ul style="list-style-type: none">• PFOS in 0229_SD129_230306 and 0229_QC153_230306. <p>The reported concentrations for the primary/field duplicate samples were within the same order of magnitude. The variability between the primary and duplicate results is inferred to be the result of the heterogenous nature of the sediment sampled.</p>
Field triplicate RPDs	<p>Field triplicate RPDs were reported within control limits for all sample sets with the exception of the following (the sample with the higher concentration is in bold):</p> <ul style="list-style-type: none">• Sum of PFOS and PFHxS and PFOS in 0229_SD233_230315 and 0229_QC207_230315.• PFBS and PFPeS in 0229_SW110_230315 and 0229_QC206_230315.• Sum of PFAS in 0229_SW129_230306 and 0229_QC252_230306. <p>The reported concentrations of the primary/field triplicate samples were within the same order of magnitude. The variability between the primary and triplicate results is inferred to be the result of slight differences in analytical methods employed by the two laboratories. This is demonstrated through the laboratory duplicate results all being within acceptable limits.</p>

Lab Report Number	ET2301429	ET2301429		ET2301429	ET2301429	
Field ID	0229_SD136_230306	0229_QC151_230306	RPD	0229_SD129_230306	0229_QC153_230306	RPD
Sampled Date/Time	6/03/2023 11:23	6/03/2023 11:23		6/03/2023 13:30	6/03/2023 13:30	

Chem_Group	ChemName	Units	EQL						
	Sum of PFAS (WA DER List)	mg/kg	0.0002	0.0006	0.0006	0	0.0014	0.0022	44
PFAS Full Suite	10:2 Fluorotelomer sulfonic acid (10:2 FTS)	mg/kg	0.0005 : 0.005 (Interlab)	<0.0005	<0.0005	0	<0.0005	<0.0005	0
	4:2 Fluorotelomer sulfonic acid (4:2 FTS)	mg/kg	0.0005 : 0.005 (Interlab)	<0.0005	<0.0005	0	<0.0005	<0.0005	0
	6:2 Fluorotelomer Sulfonate (6:2 FtS)	mg/kg	0.0005 : 0.01 (Interlab)	<0.0005	<0.0005	0	<0.0005	<0.0005	0
	8:2 Fluorotelomer sulfonic acid (8:2 FTS)	mg/kg	0.0005 : 0.005 (Interlab)	<0.0005	<0.0005	0	<0.0005	<0.0005	0
	N-Ethyl perfluorooctane sulfonamide (EtFOSA)	mg/kg	0.0005 : 0.005 (Interlab)	<0.0005	<0.0005	0	<0.0005	<0.0005	0
	N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	mg/kg	0.0002 : 0.01 (Interlab)	<0.0002	<0.0002	0	<0.0002	<0.0002	0
	N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	mg/kg	0.0005 : 0.005 (Interlab)	<0.0005	<0.0005	0	<0.0005	<0.0005	0
	N-Methyl perfluorooctane sulfonamide (MeFOSA)	mg/kg	0.0005 : 0.005 (Interlab)	<0.0005	<0.0005	0	<0.0005	<0.0005	0
	N-Methyl perfluorooctane sulfonamidoacetic acid (MFOSAA)	mg/kg	0.0002 : 0.01 (Interlab)	<0.0002	<0.0002	0	<0.0002	<0.0002	0
	N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	mg/kg	0.0005 : 0.005 (Interlab)	<0.0005	<0.0005	0	<0.0005	<0.0005	0
	Perfluorobutane sulfonic acid (PFBS)	mg/kg	0.0002 : 0.005 (Interlab)	<0.0002	<0.0002	0	<0.0002	<0.0002	0
	Perfluorobutanoic acid (PFBA)	mg/kg	0.001 : 0.005 (Interlab)	<0.001	<0.001	0	<0.001	<0.001	0
	Perfluorodecanesulfonic acid (PFDS)	mg/kg	0.0002 : 0.005 (Interlab)	<0.0002	<0.0002	0	<0.0002	<0.0002	0
	Perfluorodecanoic acid (PFDA)	mg/kg	0.0002 : 0.005 (Interlab)	<0.0002	<0.0002	0	<0.0002	<0.0002	0
	Perfluorododecanoic acid (PFDoDA)	mg/kg	0.0002 : 0.005 (Interlab)	<0.0002	<0.0002	0	<0.0002	<0.0002	0
	Perfluoroheptane sulfonic acid (PFHpS)	mg/kg	0.0002 : 0.005 (Interlab)	<0.0002	<0.0002	0	<0.0002	<0.0002	0
	Perfluoroheptanoic acid (PFHpA)	mg/kg	0.0002 : 0.005 (Interlab)	<0.0002	<0.0002	0	<0.0002	<0.0002	0
	Perfluorohexanoic acid (PFHxA)	mg/kg	0.0002 : 0.005 (Interlab)	<0.0002	<0.0002	0	<0.0002	<0.0002	0
	Perfluorononanoic acid (PFNA)	mg/kg	0.0002 : 0.005 (Interlab)	<0.0002	<0.0002	0	<0.0002	<0.0002	0
	Perfluorooctane sulfonamide (FOSA)	mg/kg	0.0002 : 0.005 (Interlab)	<0.0002	<0.0002	0	<0.0002	<0.0002	0
	Perfluoropentane sulfonic acid (PFPeS)	mg/kg	0.0002 : 0.005 (Interlab)	<0.0002	<0.0002	0	<0.0002	<0.0002	0
	Perfluoropentanoic acid (PFPeA)	mg/kg	0.0002 : 0.005 (Interlab)	<0.0002	<0.0002	0	<0.0002	<0.0002	0
	Perfluorotetradecanoic acid (PFTeDA)	mg/kg	0.0005 : 0.005 (Interlab)	<0.0005	<0.0005	0	<0.0005	<0.0005	0
	Perfluorotridecanoic acid (PFTTrDA)	mg/kg	0.0002 : 0.005 (Interlab)	<0.0002	<0.0002	0	<0.0002	<0.0002	0
	Perfluoroundecanoic acid (PFUnDA)	mg/kg	0.0002 : 0.005 (Interlab)	<0.0002	<0.0002	0	<0.0002	<0.0002	0
	Sum of PFAS	mg/kg	0.0002 : 0.05 (Interlab)	0.0006	0.0006	0	0.0014	0.0022	44
	Sum of PFHxS and PFOS	mg/kg	0.0002 : 0.005 (Interlab)	0.0006	0.0006	0	0.0014	0.0022	44
	Perfluorooctane sulfonic acid (PFOS)	mg/kg	0.0002 : 0.005 (Interlab)	0.0003	0.0003	0	0.0012	0.0022	59
	Perfluorooctanoic Acid (PFOA)	mg/kg	0.0002 : 0.005 (Interlab)	<0.0002	<0.0002	0	<0.0002	<0.0002	0
	Perfluorohexane sulfonic acid (PFHxS)	mg/kg	0.0002 : 0.005 (Interlab)	0.0003	0.0003	0	0.0002	<0.0002	0
Inorganics	Moisture Content_	%	0.1	29.8	26.6	11	20.8	19.5	6

*RPDs have only been considered where a concentration is greater than 1 times the EQL.
 **High RPDs are in bold (Acceptable RPDs for each EQL multiplier range are: 200 (1-10 x EQL); 50 (10-20 x EQL); 30 (> 20 x EQL))
 ***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



Table C1:
QA/QC Soil Sample Analytical Results

Project Name: PFAS OMP Lavarack Barracks
Sampling Event Factual Reports
March 2023

Lab Report Number	ET2301429	ET2301429		ET2301455	ET2301455	
Field ID	0229_SD217_230306	0229_QC105_230306	RPD	0229_SD233_230315	0229_QC107_230315	RPD
Sampled Date/Time	6/03/2023 15:00	6/03/2023 15:00		15/03/2023 10:53	15/03/2023 10:53	

Chem_Group	ChemName	Units	EQL						
	Sum of PFAS (WA DER List)	mg/kg	0.0002	0.0012	0.0015	22	0.0109	0.0108	1
PFAS Full Suite	10:2 Fluorotelomer sulfonic acid (10:2 FTS)	mg/kg	0.0005 : 0.005 (Interlab)	<0.0005	<0.0005	0	<0.0005	<0.0005	0
	4:2 Fluorotelomer sulfonic acid (4:2 FTS)	mg/kg	0.0005 : 0.005 (Interlab)	<0.0005	<0.0005	0	<0.0005	<0.0005	0
	6:2 Fluorotelomer Sulfonate (6:2 FtS)	mg/kg	0.0005 : 0.01 (Interlab)	<0.0005	<0.0005	0	<0.0005	<0.0005	0
	8:2 Fluorotelomer sulfonic acid (8:2 FTS)	mg/kg	0.0005 : 0.005 (Interlab)	<0.0005	<0.0005	0	<0.0005	<0.0005	0
	N-Ethyl perfluorooctane sulfonamide (EtFOSA)	mg/kg	0.0005 : 0.005 (Interlab)	<0.0005	<0.0005	0	<0.0005	<0.0005	0
	N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	mg/kg	0.0002 : 0.01 (Interlab)	<0.0002	<0.0002	0	<0.0002	<0.0002	0
	N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	mg/kg	0.0005 : 0.005 (Interlab)	<0.0005	<0.0005	0	<0.0005	<0.0005	0
	N-Methyl perfluorooctane sulfonamide (MeFOSA)	mg/kg	0.0005 : 0.005 (Interlab)	<0.0005	<0.0005	0	<0.0005	<0.0005	0
	N-Methyl perfluorooctane sulfonamidoacetic acid (MFOSAA)	mg/kg	0.0002 : 0.01 (Interlab)	<0.0002	<0.0002	0	<0.0002	<0.0002	0
	N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	mg/kg	0.0005 : 0.005 (Interlab)	<0.0005	<0.0005	0	<0.0005	<0.0005	0
	Perfluorobutane sulfonic acid (PFBS)	mg/kg	0.0002 : 0.005 (Interlab)	<0.0002	<0.0002	0	0.0003	0.0006	67
	Perfluorobutanoic acid (PFBA)	mg/kg	0.001 : 0.005 (Interlab)	<0.001	<0.001	0	<0.001	<0.001	0
	Perfluorodecanesulfonic acid (PFDS)	mg/kg	0.0002 : 0.005 (Interlab)	<0.0002	<0.0002	0	<0.0002	<0.0002	0
	Perfluorodecanoic acid (PFDA)	mg/kg	0.0002 : 0.005 (Interlab)	<0.0002	<0.0002	0	<0.0002	<0.0002	0
	Perfluorododecanoic acid (PFDoDA)	mg/kg	0.0002 : 0.005 (Interlab)	<0.0002	<0.0002	0	<0.0002	<0.0002	0
	Perfluoroheptane sulfonic acid (PFHpS)	mg/kg	0.0002 : 0.005 (Interlab)	<0.0002	<0.0002	0	<0.0002	<0.0002	0
	Perfluoroheptanoic acid (PFHpA)	mg/kg	0.0002 : 0.005 (Interlab)	<0.0002	<0.0002	0	<0.0002	<0.0002	0
	Perfluorohexanoic acid (PFHxA)	mg/kg	0.0002 : 0.005 (Interlab)	<0.0002	<0.0002	0	<0.0002	<0.0002	0
	Perfluorononanoic acid (PFNA)	mg/kg	0.0002 : 0.005 (Interlab)	<0.0002	<0.0002	0	<0.0002	<0.0002	0
	Perfluorooctane sulfonamide (FOSA)	mg/kg	0.0002 : 0.005 (Interlab)	<0.0002	<0.0002	0	<0.0002	<0.0002	0
	Perfluoropentane sulfonic acid (PFPeS)	mg/kg	0.0002 : 0.005 (Interlab)	<0.0002	<0.0002	0	0.0002	0.0004	67
	Perfluoropentanoic acid (PFPeA)	mg/kg	0.0002 : 0.005 (Interlab)	<0.0002	<0.0002	0	<0.0002	<0.0002	0
	Perfluorotetradecanoic acid (PFTeDA)	mg/kg	0.0005 : 0.005 (Interlab)	<0.0005	<0.0005	0	<0.0005	<0.0005	0
	Perfluorotridecanoic acid (PFTrDA)	mg/kg	0.0002 : 0.005 (Interlab)	<0.0002	<0.0002	0	<0.0002	<0.0002	0
	Perfluoroundecanoic acid (PFUnDA)	mg/kg	0.0002 : 0.005 (Interlab)	<0.0002	<0.0002	0	<0.0002	<0.0002	0
	Sum of PFAS	mg/kg	0.0002 : 0.05 (Interlab)	0.0012	0.0015	22	0.0111	0.0112	1
	Sum of PFHxS and PFOS	mg/kg	0.0002 : 0.005 (Interlab)	0.0012	0.0015	22	0.0106	0.0102	4
	Perfluorooctane sulfonic acid (PFOS)	mg/kg	0.0002 : 0.005 (Interlab)	0.0012	0.0015	22	0.0084	0.0074	13
	Perfluorooctanoic Acid (PFOA)	mg/kg	0.0002 : 0.005 (Interlab)	<0.0002	<0.0002	0	<0.0002	<0.0002	0
	Perfluorohexane sulfonic acid (PFHxS)	mg/kg	0.0002 : 0.005 (Interlab)	<0.0002	<0.0002	0	0.0022	0.0028	24
Inorganics	Moisture Content_	%	0.1	38.5	37.3	3	13	12.8	2

*RPDs have only been considered where a concentration is greater than 1 times the EQL.
 **High RPDs are in bold (Acceptable RPDs for each EQL multiplier range are: 200 (1-10 x EQL); 50 (10-20 x EQL); 30 (> 20 x EQL))
 ***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



Table C1:
QA/QC Soil Sample Analytical Results

Project Name: PFAS OMP Lavarack Barracks
Sampling Event Factual Reports
March 2023

Lab Report Number	ET2301429	972979		ET2301455	972979	
Field ID	0229_SD217_230306	0229_QC205_230306	RPD	0229_SD233_230315	0229_QC207_230315	RPD
Sampled Date/Time	6/03/2023 15:00	6/03/2023 15:00		15/03/2023 10:53	15/03/2023 10:53	

Chem_Group	ChemName	Units	EQL						
	Sum of PFAS (WA DER List)	mg/kg	0.0002	0.0012			0.0109		
PFAS Full Suite	10:2 Fluorotelomer sulfonic acid (10:2 FTS)	mg/kg	0.0005 : 0.005 (Interlab)	<0.0005	<0.005	0	<0.0005	<0.005	0
	4:2 Fluorotelomer sulfonic acid (4:2 FTS)	mg/kg	0.0005 : 0.005 (Interlab)	<0.0005	<0.005	0	<0.0005	<0.005	0
	6:2 Fluorotelomer Sulfonate (6:2 FtS)	mg/kg	0.0005 : 0.01 (Interlab)	<0.0005	<0.01	0	<0.0005	<0.01	0
	8:2 Fluorotelomer sulfonic acid (8:2 FTS)	mg/kg	0.0005 : 0.005 (Interlab)	<0.0005	<0.005	0	<0.0005	<0.005	0
	N-Ethyl perfluorooctane sulfonamide (EtFOSA)	mg/kg	0.0005 : 0.005 (Interlab)	<0.0005	<0.005	0	<0.0005	<0.005	0
	N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	mg/kg	0.0002 : 0.01 (Interlab)	<0.0002	<0.01	0	<0.0002	<0.01	0
	N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	mg/kg	0.0005 : 0.005 (Interlab)	<0.0005	<0.005	0	<0.0005	<0.005	0
	N-Methyl perfluorooctane sulfonamide (MeFOSA)	mg/kg	0.0005 : 0.005 (Interlab)	<0.0005	<0.005	0	<0.0005	<0.005	0
	N-Methyl perfluorooctane sulfonamidoacetic acid (MFOSAA)	mg/kg	0.0002 : 0.01 (Interlab)	<0.0002	<0.01	0	<0.0002	<0.01	0
	N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	mg/kg	0.0005 : 0.005 (Interlab)	<0.0005	<0.005	0	<0.0005	<0.005	0
	Perfluorobutane sulfonic acid (PFBS)	mg/kg	0.0002 : 0.005 (Interlab)	<0.0002	<0.005	0	0.0003	<0.005	0
	Perfluorobutanoic acid (PFBA)	mg/kg	0.001 : 0.005 (Interlab)	<0.001	<0.005	0	<0.001	<0.005	0
	Perfluorodecanesulfonic acid (PFDS)	mg/kg	0.0002 : 0.005 (Interlab)	<0.0002	<0.005	0	<0.0002	<0.005	0
	Perfluorodecanoic acid (PFDA)	mg/kg	0.0002 : 0.005 (Interlab)	<0.0002	<0.005	0	<0.0002	<0.005	0
	Perfluorododecanoic acid (PFDoDA)	mg/kg	0.0002 : 0.005 (Interlab)	<0.0002	<0.005	0	<0.0002	<0.005	0
	Perfluoroheptane sulfonic acid (PFHpS)	mg/kg	0.0002 : 0.005 (Interlab)	<0.0002	<0.005	0	<0.0002	<0.005	0
	Perfluoroheptanoic acid (PFHpA)	mg/kg	0.0002 : 0.005 (Interlab)	<0.0002	<0.005	0	<0.0002	<0.005	0
	Perfluorohexanoic acid (PFHxA)	mg/kg	0.0002 : 0.005 (Interlab)	<0.0002	<0.005	0	<0.0002	<0.005	0
	Perfluorononanoic acid (PFNA)	mg/kg	0.0002 : 0.005 (Interlab)	<0.0002	<0.005	0	<0.0002	<0.005	0
	Perfluorooctane sulfonamide (FOSA)	mg/kg	0.0002 : 0.005 (Interlab)	<0.0002	<0.005	0	<0.0002	<0.005	0
	Perfluoropentane sulfonic acid (PFPeS)	mg/kg	0.0002 : 0.005 (Interlab)	<0.0002	<0.005	0	0.0002	<0.005	0
	Perfluoropentanoic acid (PFPeA)	mg/kg	0.0002 : 0.005 (Interlab)	<0.0002	<0.005	0	<0.0002	<0.005	0
	Perfluorotetradecanoic acid (PFTeDA)	mg/kg	0.0005 : 0.005 (Interlab)	<0.0005	<0.005	0	<0.0005	<0.005	0
	Perfluorotridecanoic acid (PFTrDA)	mg/kg	0.0002 : 0.005 (Interlab)	<0.0002	<0.005	0	<0.0002	<0.005	0
	Perfluoroundecanoic acid (PFUnDA)	mg/kg	0.0002 : 0.005 (Interlab)	<0.0002	<0.005	0	<0.0002	<0.005	0
	Sum of PFAS	mg/kg	0.0002 : 0.05 (Interlab)	0.0012	<0.05	0	0.0111	<0.05	0
	Sum of PFHxS and PFOS	mg/kg	0.0002 : 0.005 (Interlab)	0.0012	<0.005	0	0.0106	0.0058	59
	Perfluorooctane sulfonic acid (PFOS)	mg/kg	0.0002 : 0.005 (Interlab)	0.0012	<0.005	0	0.0084	0.0058	37
	Perfluorooctanoic Acid (PFOA)	mg/kg	0.0002 : 0.005 (Interlab)	<0.0002	<0.005	0	<0.0002	<0.005	0
	Perfluorohexane sulfonic acid (PFHxS)	mg/kg	0.0002 : 0.005 (Interlab)	<0.0002	<0.005	0	0.0022	<0.005	0
Inorganics	Moisture Content_	%	0.1	38.5			13		

*RPDs have only been considered where a concentration is greater than 1 times the EQL.
 **High RPDs are in bold (Acceptable RPDs for each EQL multiplier range are: 200 (1-10 x EQL); 50 (10-20 x EQL); 30 (> 20 x EQL))
 ***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



Table C1:
QA/QC Soil Sample Analytical Results

Project Name: PFAS OMP Lavarack Barracks
Sampling Event Factual Reports
March 2023

Lab Report Number	ET2301429	972979		ET2301429	972979	
Field ID	0229_SD136_230306	0229_QC251_230306	RPD	0229_SD129_230306	0229_QC253_230306	RPD
Sampled Date/Time	6/03/2023 11:23	6/03/2023 11:23		6/03/2023 13:30	6/03/2023 13:30	

Chem_Group	ChemName	Units	EQL						
	Sum of PFAS (WA DER List)	mg/kg	0.0002	0.0006			0.0014		
PFAS Full Suite	10:2 Fluorotelomer sulfonic acid (10:2 FTS)	mg/kg	0.0005 : 0.005 (Interlab)	<0.0005	<0.005	0	<0.0005	<0.005	0
	4:2 Fluorotelomer sulfonic acid (4:2 FTS)	mg/kg	0.0005 : 0.005 (Interlab)	<0.0005	<0.005	0	<0.0005	<0.005	0
	6:2 Fluorotelomer Sulfonate (6:2 FtS)	mg/kg	0.0005 : 0.01 (Interlab)	<0.0005	<0.01	0	<0.0005	<0.01	0
	8:2 Fluorotelomer sulfonic acid (8:2 FTS)	mg/kg	0.0005 : 0.005 (Interlab)	<0.0005	<0.005	0	<0.0005	<0.005	0
	N-Ethyl perfluorooctane sulfonamide (EtFOSA)	mg/kg	0.0005 : 0.005 (Interlab)	<0.0005	<0.005	0	<0.0005	<0.005	0
	N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	mg/kg	0.0002 : 0.01 (Interlab)	<0.0002	<0.01	0	<0.0002	<0.01	0
	N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	mg/kg	0.0005 : 0.005 (Interlab)	<0.0005	<0.005	0	<0.0005	<0.005	0
	N-Methyl perfluorooctane sulfonamide (MeFOSA)	mg/kg	0.0005 : 0.005 (Interlab)	<0.0005	<0.005	0	<0.0005	<0.005	0
	N-Methyl perfluorooctane sulfonamidoacetic acid (MFOSAA)	mg/kg	0.0002 : 0.01 (Interlab)	<0.0002	<0.01	0	<0.0002	<0.01	0
	N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	mg/kg	0.0005 : 0.005 (Interlab)	<0.0005	<0.005	0	<0.0005	<0.005	0
	Perfluorobutane sulfonic acid (PFBS)	mg/kg	0.0002 : 0.005 (Interlab)	<0.0002	<0.005	0	<0.0002	<0.005	0
	Perfluorobutanoic acid (PFBA)	mg/kg	0.001 : 0.005 (Interlab)	<0.001	<0.005	0	<0.001	<0.005	0
	Perfluorodecanesulfonic acid (PFDS)	mg/kg	0.0002 : 0.005 (Interlab)	<0.0002	<0.005	0	<0.0002	<0.005	0
	Perfluorodecanoic acid (PFDA)	mg/kg	0.0002 : 0.005 (Interlab)	<0.0002	<0.005	0	<0.0002	<0.005	0
	Perfluorododecanoic acid (PFDoDA)	mg/kg	0.0002 : 0.005 (Interlab)	<0.0002	<0.005	0	<0.0002	<0.005	0
	Perfluoroheptane sulfonic acid (PFHpS)	mg/kg	0.0002 : 0.005 (Interlab)	<0.0002	<0.005	0	<0.0002	<0.005	0
	Perfluoroheptanoic acid (PFHpA)	mg/kg	0.0002 : 0.005 (Interlab)	<0.0002	<0.005	0	<0.0002	<0.005	0
	Perfluorohexanoic acid (PFHxA)	mg/kg	0.0002 : 0.005 (Interlab)	<0.0002	<0.005	0	<0.0002	<0.005	0
	Perfluorononanoic acid (PFNA)	mg/kg	0.0002 : 0.005 (Interlab)	<0.0002	<0.005	0	<0.0002	<0.005	0
	Perfluorooctane sulfonamide (FOSA)	mg/kg	0.0002 : 0.005 (Interlab)	<0.0002	<0.005	0	<0.0002	<0.005	0
	Perfluoropentane sulfonic acid (PFPeS)	mg/kg	0.0002 : 0.005 (Interlab)	<0.0002	<0.005	0	<0.0002	<0.005	0
	Perfluoropentanoic acid (PFPeA)	mg/kg	0.0002 : 0.005 (Interlab)	<0.0002	<0.005	0	<0.0002	<0.005	0
	Perfluorotetradecanoic acid (PFTeDA)	mg/kg	0.0005 : 0.005 (Interlab)	<0.0005	<0.005	0	<0.0005	<0.005	0
	Perfluorotridecanoic acid (PFTTrDA)	mg/kg	0.0002 : 0.005 (Interlab)	<0.0002	<0.005	0	<0.0002	<0.005	0
	Perfluoroundecanoic acid (PFUnDA)	mg/kg	0.0002 : 0.005 (Interlab)	<0.0002	<0.005	0	<0.0002	<0.005	0
	Sum of PFAS	mg/kg	0.0002 : 0.05 (Interlab)	0.0006	<0.05	0	0.0014	<0.05	0
	Sum of PFHxS and PFOS	mg/kg	0.0002 : 0.005 (Interlab)	0.0006	<0.005	0	0.0014	<0.005	0
	Perfluorooctane sulfonic acid (PFOS)	mg/kg	0.0002 : 0.005 (Interlab)	0.0003	<0.005	0	0.0012	<0.005	0
	Perfluorooctanoic Acid (PFOA)	mg/kg	0.0002 : 0.005 (Interlab)	<0.0002	<0.005	0	<0.0002	<0.005	0
	Perfluorohexane sulfonic acid (PFHxS)	mg/kg	0.0002 : 0.005 (Interlab)	0.0003	<0.005	0	0.0002	<0.005	0
Inorganics	Moisture Content_	%	0.1	29.8			20.8		

*RPDs have only been considered where a concentration is greater than 1 times the EQL.
 **High RPDs are in bold (Acceptable RPDs for each EQL multiplier range are: 200 (1-10 x EQL); 50 (10-20 x EQL); 30 (> 20 x EQL))
 ***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

Lab Report Number	ET2301429	ET2301429		ET2301429	ET2301429	
Field ID	0229_SW136_230306	0229_QC150_230306	RPD	0229_SW217_230306	0229_QC100_230306	RPD
Sampled Date/Time	6/03/2023 11:23	6/03/2023 11:23		6/03/2023 15:00	6/03/2023 15:00	

Chem_Group	ChemName	Units	EQL						
	Sum of PFAS (WA DER List)	µg/L	0.01	0.75	0.84	11	0.09	0.09	0
PFAS Full Suite	10:2 Fluorotelomer sulfonic acid (10:2 FTS)	µg/L	0.05 : 0.01 (Interlab)	<0.05	<0.05	0	<0.05	<0.05	0
	4:2 Fluorotelomer sulfonic acid (4:2 FTS)	µg/L	0.05 : 0.01 (Interlab)	<0.05	<0.05	0	<0.05	<0.05	0
	6:2 Fluorotelomer Sulfonate (6:2 FtS)	µg/L	0.05	<0.05	<0.05	0	<0.05	<0.05	0
	8:2 Fluorotelomer sulfonic acid (8:2 FTS)	µg/L	0.05 : 0.01 (Interlab)	<0.05	<0.05	0	<0.05	<0.05	0
	N-Ethyl perfluorooctane sulfonamide (EtFOSA)	µg/L	0.05	<0.05	<0.05	0	<0.05	<0.05	0
	N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	µg/L	0.02 : 0.05 (Interlab)	<0.02	<0.02	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
	N-Methyl perfluorooctane sulfonamide (MeFOSA)	µg/L	0.05	<0.05	<0.05	0	<0.05	<0.05	0
	N-Methyl perfluorooctane sulfonamidoacetic acid (MFOSAA)	µg/L	0.02 : 0.05 (Interlab)	<0.02	<0.02	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
	Perfluorobutane sulfonic acid (PFBS)	µg/L	0.02 : 0.01 (Interlab)	0.06	0.06	0	0.03	0.03	0
	Perfluorobutanoic acid (PFBA)	µg/L	0.1 : 0.05 (Interlab)	<0.1	<0.1	0	<0.1	<0.1	0
	Perfluorodecanesulfonic acid (PFDS)	µg/L	0.02 : 0.01 (Interlab)	<0.02	<0.02	0	<0.02	<0.02	0
	Perfluorodecanoic acid (PFDA)	µg/L	0.02 : 0.01 (Interlab)	<0.02	<0.02	0	<0.02	<0.02	0
	Perfluorododecanoic acid (PFDoDA)	µg/L	0.02 : 0.01 (Interlab)	<0.02	<0.02	0	<0.02	<0.02	0
	Perfluoroheptane sulfonic acid (PFHpS)	µg/L	0.02 : 0.01 (Interlab)	<0.02	<0.02	0	<0.02	<0.02	0
	Perfluoroheptanoic acid (PFHpA)	µg/L	0.02 : 0.01 (Interlab)	<0.02	<0.02	0	<0.02	<0.02	0
	Perfluorohexanoic acid (PFHxA)	µg/L	0.02 : 0.01 (Interlab)	0.07	0.08	13	<0.02	<0.02	0
	Perfluorononanoic acid (PFNA)	µg/L	0.02 : 0.01 (Interlab)	<0.02	<0.02	0	<0.02	<0.02	0
	Perfluorooctane sulfonamide (FOSA)	µg/L	0.02 : 0.05 (Interlab)	<0.02	<0.02	0	<0.02	<0.02	0
	Perfluoropentane sulfonic acid (PFPeS)	µg/L	0.02 : 0.01 (Interlab)	0.03	0.03	0	<0.02	<0.02	0
	Perfluoropentanoic acid (PFPeA)	µg/L	0.02 : 0.01 (Interlab)	<0.02	<0.02	0	<0.02	<0.02	0
	Perfluorotetradecanoic acid (PFTeDA)	µg/L	0.05 : 0.01 (Interlab)	<0.05	<0.05	0	<0.05	<0.05	0
	Perfluorotridecanoic acid (PFTrDA)	µg/L	0.02 : 0.01 (Interlab)	<0.02	<0.02	0	<0.02	<0.02	0
	Perfluoroundecanoic acid (PFUnDA)	µg/L	0.02 : 0.01 (Interlab)	<0.02	<0.02	0	<0.02	<0.02	0
	Sum of PFAS	µg/L	0.01 : 0.1 (Interlab)	0.78	0.87	11	0.09	0.09	0
	Sum of PFHxS and PFOS	µg/L	0.01	0.61	0.69	12	0.06	0.06	0
	Perfluorooctane sulfonic acid (PFOS)	µg/L	0.01	0.3	0.38	24	0.02	0.02	0
	Perfluorooctanoic Acid (PFOA)	µg/L	0.01	0.01	0.01	0	<0.01	<0.01	0
	Perfluorohexane sulfonic acid (PFHxS)	µg/L	0.01	0.31	0.31	0	0.04	0.04	0

*RPDs have only been considered where a concentration is greater than 1 times the EQL.
 **High RPDs are in bold (Acceptable RPDs for each EQL multiplier range are: 200 (1-10 x EQL); 50 (10-20 x EQL); 30 (> 20 x EQL))
 ***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

Lab Report Number	ET2301429	ET2301429		ET2301429	ET2301429	
Field ID	0229_SW129_230306	0229_QC152_230306	RPD	0229_MW217_230308	0229_QC101_230308	RPD
Sampled Date/Time	6/03/2023 13:30	6/03/2023 13:30		8/03/2023 14:30	8/03/2023 14:30	

Chem_Group	ChemName	Units	EQL						
	Sum of PFAS (WA DER List)	µg/L	0.01	1.1	1.11	1	0.06	0.03	67
PFAS Full Suite	10:2 Fluorotelomer sulfonic acid (10:2 FTS)	µg/L	0.05 : 0.01 (Interlab)	<0.05	<0.05	0	<0.05	<0.05	0
	4:2 Fluorotelomer sulfonic acid (4:2 FTS)	µg/L	0.05 : 0.01 (Interlab)	<0.05	<0.05	0	<0.05	<0.05	0
	6:2 Fluorotelomer Sulfonate (6:2 FtS)	µg/L	0.05	<0.05	<0.05	0	<0.05	<0.05	0
	8:2 Fluorotelomer sulfonic acid (8:2 FTS)	µg/L	0.05 : 0.01 (Interlab)	<0.05	<0.05	0	<0.05	<0.05	0
	N-Ethyl perfluorooctane sulfonamide (EtFOSA)	µg/L	0.05	<0.05	<0.05	0	<0.05	<0.05	0
	N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	µg/L	0.02 : 0.05 (Interlab)	<0.02	<0.02	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
	N-Methyl perfluorooctane sulfonamide (MeFOSA)	µg/L	0.05	<0.05	<0.05	0	<0.05	<0.05	0
	N-Methyl perfluorooctane sulfonamidoacetic acid (MFOSAA)	µg/L	0.02 : 0.05 (Interlab)	<0.02	<0.02	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
	Perfluorobutane sulfonic acid (PFBS)	µg/L	0.02 : 0.01 (Interlab)	0.09	0.1	11	0.03	0.03	0
	Perfluorobutanoic acid (PFBA)	µg/L	0.1 : 0.05 (Interlab)	0.1	0.1	0	<0.1	<0.1	0
	Perfluorodecanesulfonic acid (PFDS)	µg/L	0.02 : 0.01 (Interlab)	<0.02	<0.02	0	<0.02	<0.02	0
	Perfluorodecanoic acid (PFDA)	µg/L	0.02 : 0.01 (Interlab)	<0.02	<0.02	0	<0.02	<0.02	0
	Perfluorododecanoic acid (PFDoDA)	µg/L	0.02 : 0.01 (Interlab)	<0.02	<0.02	0	<0.02	<0.02	0
	Perfluoroheptane sulfonic acid (PFHpS)	µg/L	0.02 : 0.01 (Interlab)	<0.02	<0.02	0	<0.02	<0.02	0
	Perfluoroheptanoic acid (PFHpA)	µg/L	0.02 : 0.01 (Interlab)	0.04	0.05	22	<0.02	<0.02	0
	Perfluorohexanoic acid (PFHxA)	µg/L	0.02 : 0.01 (Interlab)	0.15	0.15	0	<0.02	<0.02	0
	Perfluorononanoic acid (PFNA)	µg/L	0.02 : 0.01 (Interlab)	<0.02	<0.02	0	<0.02	<0.02	0
	Perfluorooctane sulfonamide (FOSA)	µg/L	0.02 : 0.05 (Interlab)	<0.02	<0.02	0	<0.02	<0.02	0
	Perfluoropentane sulfonic acid (PFPeS)	µg/L	0.02 : 0.01 (Interlab)	0.04	0.04	0	<0.02	<0.02	0
	Perfluoropentanoic acid (PFPeA)	µg/L	0.02 : 0.01 (Interlab)	0.17	0.17	0	<0.02	<0.02	0
	Perfluorotetradecanoic acid (PFTeDA)	µg/L	0.05 : 0.01 (Interlab)	<0.05	<0.05	0	<0.05	<0.05	0
	Perfluorotridecanoic acid (PFTrDA)	µg/L	0.02 : 0.01 (Interlab)	<0.02	<0.02	0	<0.02	<0.02	0
	Perfluoroundecanoic acid (PFUnDA)	µg/L	0.02 : 0.01 (Interlab)	<0.02	<0.02	0	<0.02	<0.02	0
	Sum of PFAS	µg/L	0.01 : 0.1 (Interlab)	1.14	1.15	1	0.06	0.03	67
	Sum of PFHxS and PFOS	µg/L	0.01	0.51	0.5	2	0.03	<0.01	100
	Perfluorooctane sulfonic acid (PFOS)	µg/L	0.01	0.2	0.2	0	0.02	<0.01	67
	Perfluorooctanoic Acid (PFOA)	µg/L	0.01	0.04	0.04	0	<0.01	<0.01	0
	Perfluorohexane sulfonic acid (PFHxS)	µg/L	0.01	0.31	0.3	3	0.01	<0.01	0

*RPDs have only been considered where a concentration is greater than 1 times the EQL.
 **High RPDs are in bold (Acceptable RPDs for each EQL multiplier range are: 200 (1-10 x EQL); 50 (10-20 x EQL); 30 (> 20 x EQL))
 ***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

Lab Report Number	ET2301429	ET2301429		ET2301429	ET2301429	
Field ID	0229_MW122_230308	0229_QC154_230308	RPD	0229_MW118_230309	0229_QC103_230309	RPD
Sampled Date/Time	8/03/2023 12:50	8/03/2023 12:50		9/03/2023 11:50	9/03/2023 11:50	

Chem_Group	ChemName	Units	EQL						
	Sum of PFAS (WA DER List)	µg/L	0.01	3.67	3.05	18	0.12	0.12	0
PFAS Full Suite	10:2 Fluorotelomer sulfonic acid (10:2 FTS)	µg/L	0.05 : 0.01 (Interlab)	<0.05	<0.05	0	<0.05	<0.05	0
	4:2 Fluorotelomer sulfonic acid (4:2 FTS)	µg/L	0.05 : 0.01 (Interlab)	<0.05	<0.05	0	<0.05	<0.05	0
	6:2 Fluorotelomer Sulfonate (6:2 FtS)	µg/L	0.05	<0.05	<0.05	0	<0.05	<0.05	0
	8:2 Fluorotelomer sulfonic acid (8:2 FTS)	µg/L	0.05 : 0.01 (Interlab)	<0.05	<0.05	0	<0.05	<0.05	0
	N-Ethyl perfluorooctane sulfonamide (EtFOSA)	µg/L	0.05	<0.05	<0.05	0	<0.05	<0.05	0
	N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	µg/L	0.02 : 0.05 (Interlab)	<0.02	<0.02	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
	N-Methyl perfluorooctane sulfonamide (MeFOSA)	µg/L	0.05	<0.05	<0.05	0	<0.05	<0.05	0
	N-Methyl perfluorooctane sulfonamidoacetic acid (MFOSAA)	µg/L	0.02 : 0.05 (Interlab)	<0.02	<0.02	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
	Perfluorobutane sulfonic acid (PFBS)	µg/L	0.02 : 0.01 (Interlab)	0.16	0.16	0	0.08	0.08	0
	Perfluorobutanoic acid (PFBA)	µg/L	0.1 : 0.05 (Interlab)	<0.1	<0.1	0	<0.1	<0.1	0
	Perfluorodecanesulfonic acid (PFDS)	µg/L	0.02 : 0.01 (Interlab)	<0.02	<0.02	0	<0.02	<0.02	0
	Perfluorodecanoic acid (PFDA)	µg/L	0.02 : 0.01 (Interlab)	<0.02	<0.02	0	<0.02	<0.02	0
	Perfluorododecanoic acid (PFDoDA)	µg/L	0.02 : 0.01 (Interlab)	<0.02	<0.02	0	<0.02	<0.02	0
	Perfluoroheptane sulfonic acid (PFHpS)	µg/L	0.02 : 0.01 (Interlab)	0.07	0.06	15	<0.02	<0.02	0
	Perfluoroheptanoic acid (PFHpA)	µg/L	0.02 : 0.01 (Interlab)	<0.02	<0.02	0	<0.02	<0.02	0
	Perfluorohexanoic acid (PFHxA)	µg/L	0.02 : 0.01 (Interlab)	0.11	0.1	10	<0.02	<0.02	0
	Perfluorononanoic acid (PFNA)	µg/L	0.02 : 0.01 (Interlab)	<0.02	<0.02	0	<0.02	<0.02	0
	Perfluorooctane sulfonamide (FOSA)	µg/L	0.02 : 0.05 (Interlab)	<0.02	<0.02	0	<0.02	<0.02	0
	Perfluoropentane sulfonic acid (PFPeS)	µg/L	0.02 : 0.01 (Interlab)	0.12	0.11	9	<0.02	<0.02	0
	Perfluoropentanoic acid (PFPeA)	µg/L	0.02 : 0.01 (Interlab)	0.02	<0.02	0	<0.02	<0.02	0
	Perfluorotetradecanoic acid (PFTeDA)	µg/L	0.05 : 0.01 (Interlab)	<0.05	<0.05	0	<0.05	<0.05	0
	Perfluorotridecanoic acid (PFTrDA)	µg/L	0.02 : 0.01 (Interlab)	<0.02	<0.02	0	<0.02	<0.02	0
	Perfluoroundecanoic acid (PFUnDA)	µg/L	0.02 : 0.01 (Interlab)	<0.02	<0.02	0	<0.02	<0.02	0
	Sum of PFAS	µg/L	0.01 : 0.1 (Interlab)	3.86	3.22	18	0.12	0.12	0
	Sum of PFHxS and PFOS	µg/L	0.01	3.31	2.74	19	0.04	0.04	0
	Perfluorooctane sulfonic acid (PFOS)	µg/L	0.01	2.37	1.98	18	0.01	0.01	0
	Perfluorooctanoic Acid (PFOA)	µg/L	0.01	0.07	0.05	33	<0.01	<0.01	0
	Perfluorohexane sulfonic acid (PFHxS)	µg/L	0.01	0.94	0.76	21	0.03	0.03	0

*RPDs have only been considered where a concentration is greater than 1 times the EQL.
 **High RPDs are in bold (Acceptable RPDs for each EQL multiplier range are: 200 (1-10 x EQL); 50 (10-20 x EQL); 30 (> 20 x EQL))
 ***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

Lab Report Number	ET2301429	ET2301429		ET2301455	ET2301455	
Field ID	0229_MW232_230309	0229_QC102_230309	RPD	0229_SW110_230315	0229_QC106_230315	RPD
Sampled Date/Time	9/03/2023 10:05	9/03/2023 10:05		15/03/2023 10:03	15/03/2023 10:03	

Chem_Group	ChemName	Units	EQL						
	Sum of PFAS (WA DER List)	µg/L	0.01	0.42	0.42	0	91.1	88.6	3
PFAS Full Suite	10:2 Fluorotelomer sulfonic acid (10:2 FTS)	µg/L	0.05 : 0.01 (Interlab)	<0.05	<0.05	0	<0.09	<0.1	0
	4:2 Fluorotelomer sulfonic acid (4:2 FTS)	µg/L	0.05 : 0.01 (Interlab)	<0.05	<0.05	0	<0.09	<0.1	0
	6:2 Fluorotelomer Sulfonate (6:2 FtS)	µg/L	0.05	<0.05	<0.05	0	<0.09	<0.1	0
	8:2 Fluorotelomer sulfonic acid (8:2 FTS)	µg/L	0.05 : 0.01 (Interlab)	<0.05	<0.05	0	<0.09	<0.1	0
	N-Ethyl perfluorooctane sulfonamide (EtFOSA)	µg/L	0.05	<0.05	<0.05	0	<0.23	<0.25	0
	N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	µg/L	0.02 : 0.05 (Interlab)	<0.02	<0.02	0	<0.09	<0.1	0
	N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	µg/L	0.05	<0.05	<0.05	0	<0.23	<0.25	0
	N-Methyl perfluorooctane sulfonamide (MeFOSA)	µg/L	0.05	<0.05	<0.05	0	<0.23	<0.25	0
	N-Methyl perfluorooctane sulfonamidoacetic acid (MFOSAA)	µg/L	0.02 : 0.05 (Interlab)	<0.02	<0.02	0	<0.09	<0.1	0
	N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	µg/L	0.05	<0.05	<0.05	0	<0.23	<0.25	0
	Perfluorobutane sulfonic acid (PFBS)	µg/L	0.02 : 0.01 (Interlab)	0.17	0.16	6	4.68	4.43	5
	Perfluorobutanoic acid (PFBA)	µg/L	0.1 : 0.05 (Interlab)	<0.1	<0.1	0	0.7	0.6	15
	Perfluorodecanesulfonic acid (PFDS)	µg/L	0.02 : 0.01 (Interlab)	<0.02	<0.02	0	<0.09	<0.1	0
	Perfluorodecanoic acid (PFDA)	µg/L	0.02 : 0.01 (Interlab)	<0.02	<0.02	0	<0.09	<0.1	0
	Perfluorododecanoic acid (PFDoDA)	µg/L	0.02 : 0.01 (Interlab)	<0.02	<0.02	0	<0.09	<0.1	0
	Perfluoroheptane sulfonic acid (PFHpS)	µg/L	0.02 : 0.01 (Interlab)	<0.02	<0.02	0	2.4	2.14	11
	Perfluoroheptanoic acid (PFHpA)	µg/L	0.02 : 0.01 (Interlab)	<0.02	<0.02	0	1.16	1.12	4
	Perfluorohexanoic acid (PFHxA)	µg/L	0.02 : 0.01 (Interlab)	<0.02	<0.02	0	9.79	9.77	0
	Perfluorononanoic acid (PFNA)	µg/L	0.02 : 0.01 (Interlab)	<0.02	<0.02	0	<0.12	<0.1	0
	Perfluorooctane sulfonamide (FOSA)	µg/L	0.02 : 0.05 (Interlab)	<0.02	<0.02	0	<0.09	<0.1	0
	Perfluoropentane sulfonic acid (PFPeS)	µg/L	0.02 : 0.01 (Interlab)	<0.02	<0.02	0	4.93	4.43	11
	Perfluoropentanoic acid (PFPeA)	µg/L	0.02 : 0.01 (Interlab)	<0.02	<0.02	0	1.91	1.98	4
	Perfluorotetradecanoic acid (PFTeDA)	µg/L	0.05 : 0.01 (Interlab)	<0.05	<0.05	0	<0.23	<0.25	0
	Perfluorotridecanoic acid (PFTrDA)	µg/L	0.02 : 0.01 (Interlab)	<0.02	<0.02	0	<0.09	<0.1	0
	Perfluoroundecanoic acid (PFUnDA)	µg/L	0.02 : 0.01 (Interlab)	<0.02	<0.02	0	<0.09	<0.1	0
	Sum of PFAS	µg/L	0.01 : 0.1 (Interlab)	0.42	0.42	0	98.4	95.2	3
	Sum of PFHxS and PFOS	µg/L	0.01	0.25	0.26	4	70.2	68	3
	Perfluorooctane sulfonic acid (PFOS)	µg/L	0.01	0.13	0.14	7	36.9	37.1	1
	Perfluorooctanoic Acid (PFOA)	µg/L	0.01	<0.01	<0.01	0	2.67	2.73	2
	Perfluorohexane sulfonic acid (PFHxS)	µg/L	0.01	0.12	0.12	0	33.3	30.9	7

*RPDs have only been considered where a concentration is greater than 1 times the EQL.
 **High RPDs are in bold (Acceptable RPDs for each EQL multiplier range are: 200 (1-10 x EQL); 50 (10-20 x EQL); 30 (> 20 x EQL))
 ***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

Lab Report Number	ET2301429	972979		ET2301429	972979	
Field ID	0229_SW217_230306	0229_QC200_230306	RPD	0229_MW217_230308	0229_QC201_230308	RPD
Sampled Date/Time	6/03/2023 15:00	6/03/2023 15:00		8/03/2023 14:30	8/03/2023 14:30	

Chem_Group	ChemName	Units	EQL						
	Sum of PFAS (WA DER List)	µg/L	0.01	0.09			0.06		
PFAS Full Suite	10:2 Fluorotelomer sulfonic acid (10:2 FTS)	µg/L	0.05 : 0.01 (Interlab)	<0.05	<0.01	0	<0.05	<0.01	0
	4:2 Fluorotelomer sulfonic acid (4:2 FTS)	µg/L	0.05 : 0.01 (Interlab)	<0.05	<0.01	0	<0.05	<0.01	0
	6:2 Fluorotelomer Sulfonate (6:2 FtS)	µg/L	0.05	<0.05	<0.05	0	<0.05	<0.05	0
	8:2 Fluorotelomer sulfonic acid (8:2 FTS)	µg/L	0.05 : 0.01 (Interlab)	<0.05	<0.01	0	<0.05	<0.01	0
	N-Ethyl perfluorooctane sulfonamide (EtFOSA)	µg/L	0.05	<0.05	<0.05	0	<0.05	<0.05	0
	N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	µg/L	0.02 : 0.05 (Interlab)	<0.02	<0.05	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
	N-Methyl perfluorooctane sulfonamide (MeFOSA)	µg/L	0.05	<0.05	<0.05	0	<0.05	<0.05	0
	N-Methyl perfluorooctane sulfonamidoacetic acid (MFOSAA)	µg/L	0.02 : 0.05 (Interlab)	<0.02	<0.05	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
	Perfluorobutane sulfonic acid (PFBS)	µg/L	0.02 : 0.01 (Interlab)	0.03	0.01	100	0.03	0.02	40
	Perfluorobutanoic acid (PFBA)	µg/L	0.1 : 0.05 (Interlab)	<0.1	<0.05	0	<0.1	<0.05	0
	Perfluorodecanesulfonic acid (PFDS)	µg/L	0.02 : 0.01 (Interlab)	<0.02	<0.01	0	<0.02	<0.01	0
	Perfluorodecanoic acid (PFDA)	µg/L	0.02 : 0.01 (Interlab)	<0.02	<0.01	0	<0.02	<0.01	0
	Perfluorododecanoic acid (PFDoDA)	µg/L	0.02 : 0.01 (Interlab)	<0.02	<0.01	0	<0.02	<0.01	0
	Perfluoroheptane sulfonic acid (PFHpS)	µg/L	0.02 : 0.01 (Interlab)	<0.02	<0.01	0	<0.02	<0.01	0
	Perfluoroheptanoic acid (PFHpA)	µg/L	0.02 : 0.01 (Interlab)	<0.02	<0.01	0	<0.02	<0.01	0
	Perfluorohexanoic acid (PFHxA)	µg/L	0.02 : 0.01 (Interlab)	<0.02	0.02	0	<0.02	<0.01	0
	Perfluorononanoic acid (PFNA)	µg/L	0.02 : 0.01 (Interlab)	<0.02	<0.01	0	<0.02	<0.01	0
	Perfluorooctane sulfonamide (FOSA)	µg/L	0.02 : 0.05 (Interlab)	<0.02	<0.05	0	<0.02	<0.05	0
	Perfluoropentane sulfonic acid (PFPeS)	µg/L	0.02 : 0.01 (Interlab)	<0.02	<0.01	0	<0.02	<0.01	0
	Perfluoropentanoic acid (PFPeA)	µg/L	0.02 : 0.01 (Interlab)	<0.02	<0.01	0	<0.02	<0.01	0
	Perfluorotetradecanoic acid (PFTeDA)	µg/L	0.05 : 0.01 (Interlab)	<0.05	<0.01	0	<0.05	<0.01	0
	Perfluorotridecanoic acid (PFTrDA)	µg/L	0.02 : 0.01 (Interlab)	<0.02	<0.01	0	<0.02	<0.01	0
	Perfluoroundecanoic acid (PFUnDA)	µg/L	0.02 : 0.01 (Interlab)	<0.02	<0.01	0	<0.02	<0.01	0
	Sum of PFAS	µg/L	0.01 : 0.1 (Interlab)	0.09	<0.1	0	0.06	<0.1	0
	Sum of PFHxS and PFOS	µg/L	0.01	0.06	0.04	40	0.03	0.01	100
	Perfluorooctane sulfonic acid (PFOS)	µg/L	0.01	0.02	<0.01	67	0.02	<0.01	67
	Perfluorooctanoic Acid (PFOA)	µg/L	0.01	<0.01	<0.01	0	<0.01	<0.01	0
	Perfluorohexane sulfonic acid (PFHxS)	µg/L	0.01	0.04	0.04	0	0.01	0.01	0

*RPDs have only been considered where a concentration is greater than 1 times the EQL.
 **High RPDs are in bold (Acceptable RPDs for each EQL multiplier range are: 200 (1-10 x EQL); 50 (10-20 x EQL); 30 (> 20 x EQL))
 ***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

Lab Report Number	ET2301429	972979		ET2301455	972979	
Field ID	0229_MW232_230309	0229_QC202_230309	RPD	0229_SW110_230315	0229_QC206_230315	RPD
Sampled Date/Time	9/03/2023 10:05	9/03/2023 10:05		15/03/2023 10:03	15/03/2023 10:03	

Chem_Group	ChemName	Units	EQL						
	Sum of PFAS (WA DER List)	µg/L	0.01	0.42			91.1		
PFAS Full Suite	10:2 Fluorotelomer sulfonic acid (10:2 FTS)	µg/L	0.05 : 0.01 (Interlab)	<0.05	<0.01	0	<0.09	<0.01	0
	4:2 Fluorotelomer sulfonic acid (4:2 FTS)	µg/L	0.05 : 0.01 (Interlab)	<0.05	<0.01	0	<0.09	<0.01	0
	6:2 Fluorotelomer Sulfonate (6:2 FtS)	µg/L	0.05	<0.05	<0.05	0	<0.09	0.1	11
	8:2 Fluorotelomer sulfonic acid (8:2 FTS)	µg/L	0.05 : 0.01 (Interlab)	<0.05	<0.01	0	<0.09	0.02	0
	N-Ethyl perfluorooctane sulfonamide (EtFOSA)	µg/L	0.05	<0.05	<0.05	0	<0.23	<0.05	0
	N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	µg/L	0.02 : 0.05 (Interlab)	<0.02	<0.05	0	<0.09	<0.05	0
	N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	µg/L	0.05	<0.05	<0.05	0	<0.23	<0.05	0
	N-Methyl perfluorooctane sulfonamide (MeFOSA)	µg/L	0.05	<0.05	<0.05	0	<0.23	<0.05	0
	N-Methyl perfluorooctane sulfonamidoacetic acid (MFOSAA)	µg/L	0.02 : 0.05 (Interlab)	<0.02	<0.05	0	<0.09	<0.05	0
	N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	µg/L	0.05	<0.05	<0.05	0	<0.23	<0.05	0
	Perfluorobutane sulfonic acid (PFBS)	µg/L	0.02 : 0.01 (Interlab)	0.17	0.07	83	4.68	2.8	50
	Perfluorobutanoic acid (PFBA)	µg/L	0.1 : 0.05 (Interlab)	<0.1	0.07	0	0.7	0.99	34
	Perfluorodecanesulfonic acid (PFDS)	µg/L	0.02 : 0.01 (Interlab)	<0.02	<0.01	0	<0.09	<0.01	0
	Perfluorodecanoic acid (PFDA)	µg/L	0.02 : 0.01 (Interlab)	<0.02	<0.01	0	<0.09	<0.01	0
	Perfluorododecanoic acid (PFDoDA)	µg/L	0.02 : 0.01 (Interlab)	<0.02	<0.01	0	<0.09	<0.01	0
	Perfluoroheptane sulfonic acid (PFHpS)	µg/L	0.02 : 0.01 (Interlab)	<0.02	<0.01	0	2.4	1.9	23
	Perfluoroheptanoic acid (PFHpA)	µg/L	0.02 : 0.01 (Interlab)	<0.02	<0.01	0	1.16	1.3	11
	Perfluorohexanoic acid (PFHxA)	µg/L	0.02 : 0.01 (Interlab)	<0.02	<0.01	0	9.79	7.5	26
	Perfluorononanoic acid (PFNA)	µg/L	0.02 : 0.01 (Interlab)	<0.02	<0.01	0	<0.12	0.11	0
	Perfluorooctane sulfonamide (FOSA)	µg/L	0.02 : 0.05 (Interlab)	<0.02	<0.05	0	<0.09	0.07	0
	Perfluoropentane sulfonic acid (PFPeS)	µg/L	0.02 : 0.01 (Interlab)	<0.02	<0.01	0	4.93	2.5	65
	Perfluoropentanoic acid (PFPeA)	µg/L	0.02 : 0.01 (Interlab)	<0.02	<0.01	0	1.91	1.5	24
	Perfluorotetradecanoic acid (PFTeDA)	µg/L	0.05 : 0.01 (Interlab)	<0.05	<0.01	0	<0.23	<0.01	0
	Perfluorotridecanoic acid (PFTrDA)	µg/L	0.02 : 0.01 (Interlab)	<0.02	<0.01	0	<0.09	<0.01	0
	Perfluoroundecanoic acid (PFUnDA)	µg/L	0.02 : 0.01 (Interlab)	<0.02	<0.01	0	<0.09	<0.01	0
	Sum of PFAS	µg/L	0.01 : 0.1 (Interlab)	0.42	0.34	21	98.4	83.95	16
	Sum of PFHxS and PFOS	µg/L	0.01	0.25	0.2	22	70.2	61	14
	Perfluorooctane sulfonic acid (PFOS)	µg/L	0.01	0.13	0.1	26	36.9	32	14
	Perfluorooctanoic Acid (PFOA)	µg/L	0.01	<0.01	<0.01	0	2.67	2.7	1
	Perfluorohexane sulfonic acid (PFHxS)	µg/L	0.01	0.12	0.1	18	33.3	29	14

*RPDs have only been considered where a concentration is greater than 1 times the EQL.
 **High RPDs are in bold (Acceptable RPDs for each EQL multiplier range are: 200 (1-10 x EQL); 50 (10-20 x EQL); 30 (> 20 x EQL))
 ***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

Lab Report Number	ET2301429	972979		ET2301429	972979	
Field ID	0229_MW118_230309	0229_QC203_230309	RPD	0229_SW136_230306	0229_QC250_230306	RPD
Sampled Date/Time	9/03/2023 11:50	9/03/2023 11:50		6/03/2023 11:23	6/03/2023 11:23	

Chem_Group	ChemName	Units	EQL						
	Sum of PFAS (WA DER List)	µg/L	0.01	0.12			0.75		
PFAS Full Suite	10:2 Fluorotelomer sulfonic acid (10:2 FTS)	µg/L	0.05 : 0.01 (Interlab)	<0.05	<0.01	0	<0.05	<0.01	0
	4:2 Fluorotelomer sulfonic acid (4:2 FTS)	µg/L	0.05 : 0.01 (Interlab)	<0.05	<0.01	0	<0.05	<0.01	0
	6:2 Fluorotelomer Sulfonate (6:2 FtS)	µg/L	0.05	<0.05	<0.05	0	<0.05	<0.05	0
	8:2 Fluorotelomer sulfonic acid (8:2 FTS)	µg/L	0.05 : 0.01 (Interlab)	<0.05	<0.01	0	<0.05	<0.01	0
	N-Ethyl perfluorooctane sulfonamide (EtFOSA)	µg/L	0.05	<0.05	<0.05	0	<0.05	<0.05	0
	N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	µg/L	0.02 : 0.05 (Interlab)	<0.02	<0.05	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
	N-Methyl perfluorooctane sulfonamide (MeFOSA)	µg/L	0.05	<0.05	<0.05	0	<0.05	<0.05	0
	N-Methyl perfluorooctane sulfonamidoacetic acid (MFOSAA)	µg/L	0.02 : 0.05 (Interlab)	<0.02	<0.05	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
	Perfluorobutane sulfonic acid (PFBS)	µg/L	0.02 : 0.01 (Interlab)	0.08	0.04	67	0.06	0.03	67
	Perfluorobutanoic acid (PFBA)	µg/L	0.1 : 0.05 (Interlab)	<0.1	<0.05	0	<0.1	<0.05	0
	Perfluorodecanesulfonic acid (PFDS)	µg/L	0.02 : 0.01 (Interlab)	<0.02	<0.01	0	<0.02	<0.01	0
	Perfluorodecanoic acid (PFDA)	µg/L	0.02 : 0.01 (Interlab)	<0.02	<0.01	0	<0.02	<0.01	0
	Perfluorododecanoic acid (PFDoDA)	µg/L	0.02 : 0.01 (Interlab)	<0.02	<0.01	0	<0.02	<0.01	0
	Perfluoroheptane sulfonic acid (PFHpS)	µg/L	0.02 : 0.01 (Interlab)	<0.02	<0.01	0	<0.02	<0.01	0
	Perfluoroheptanoic acid (PFHpA)	µg/L	0.02 : 0.01 (Interlab)	<0.02	<0.01	0	<0.02	<0.01	0
	Perfluorohexanoic acid (PFHxA)	µg/L	0.02 : 0.01 (Interlab)	<0.02	<0.01	0	0.07	0.05	33
	Perfluorononanoic acid (PFNA)	µg/L	0.02 : 0.01 (Interlab)	<0.02	<0.01	0	<0.02	<0.01	0
	Perfluorooctane sulfonamide (FOSA)	µg/L	0.02 : 0.05 (Interlab)	<0.02	<0.05	0	<0.02	<0.05	0
	Perfluoropentane sulfonic acid (PFPeS)	µg/L	0.02 : 0.01 (Interlab)	<0.02	<0.01	0	0.03	0.02	40
	Perfluoropentanoic acid (PFPeA)	µg/L	0.02 : 0.01 (Interlab)	<0.02	<0.01	0	<0.02	<0.01	0
	Perfluorotetradecanoic acid (PFTeDA)	µg/L	0.05 : 0.01 (Interlab)	<0.05	<0.01	0	<0.05	<0.01	0
	Perfluorotridecanoic acid (PFTrDA)	µg/L	0.02 : 0.01 (Interlab)	<0.02	<0.01	0	<0.02	<0.01	0
	Perfluoroundecanoic acid (PFUnDA)	µg/L	0.02 : 0.01 (Interlab)	<0.02	<0.01	0	<0.02	<0.01	0
	Sum of PFAS	µg/L	0.01 : 0.1 (Interlab)	0.12	<0.1	18	0.78	0.68	14
	Sum of PFHxS and PFOS	µg/L	0.01	0.04	0.03	29	0.61	0.58	5
	Perfluorooctane sulfonic acid (PFOS)	µg/L	0.01	0.01	<0.01	0	0.3	0.33	10
	Perfluorooctanoic Acid (PFOA)	µg/L	0.01	<0.01	<0.01	0	0.01	<0.01	0
	Perfluorohexane sulfonic acid (PFHxS)	µg/L	0.01	0.03	0.03	0	0.31	0.25	21

*RPDs have only been considered where a concentration is greater than 1 times the EQL.
 **High RPDs are in bold (Acceptable RPDs for each EQL multiplier range are: 200 (1-10 x EQL); 50 (10-20 x EQL); 30 (> 20 x EQL))
 ***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

Lab Report Number	ET2301429	972979		ET2301429	972979	
Field ID	0229_SW129_230306	0229_QC252_230306	RPD	0229_MW122_230308	0229_QC254_230308	RPD
Sampled Date/Time	6/03/2023 13:30	6/03/2023 13:30		8/03/2023 12:50	8/03/2023 12:50	

Chem_Group	ChemName	Units	EQL						
	Sum of PFAS (WA DER List)	µg/L	0.01	1.1			3.67		
PFAS Full Suite	10:2 Fluorotelomer sulfonic acid (10:2 FTS)	µg/L	0.05 : 0.01 (Interlab)	<0.05	<0.01	0	<0.05	<0.01	0
	4:2 Fluorotelomer sulfonic acid (4:2 FTS)	µg/L	0.05 : 0.01 (Interlab)	<0.05	<0.01	0	<0.05	<0.01	0
	6:2 Fluorotelomer Sulfonate (6:2 FtS)	µg/L	0.05	<0.05	<0.05	0	<0.05	<0.05	0
	8:2 Fluorotelomer sulfonic acid (8:2 FTS)	µg/L	0.05 : 0.01 (Interlab)	<0.05	<0.01	0	<0.05	<0.01	0
	N-Ethyl perfluorooctane sulfonamide (EtFOSA)	µg/L	0.05	<0.05	<0.05	0	<0.05	<0.05	0
	N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	µg/L	0.02 : 0.05 (Interlab)	<0.02	<0.05	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
	N-Methyl perfluorooctane sulfonamide (MeFOSA)	µg/L	0.05	<0.05	<0.05	0	<0.05	<0.05	0
	N-Methyl perfluorooctane sulfonamidoacetic acid (MFOSAA)	µg/L	0.02 : 0.05 (Interlab)	<0.02	<0.05	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
	Perfluorobutane sulfonic acid (PFBS)	µg/L	0.02 : 0.01 (Interlab)	0.09	0.05	57	0.16	0.08	67
	Perfluorobutanoic acid (PFBA)	µg/L	0.1 : 0.05 (Interlab)	0.1	0.1	0	<0.1	0.08	0
	Perfluorodecanesulfonic acid (PFDS)	µg/L	0.02 : 0.01 (Interlab)	<0.02	<0.01	0	<0.02	<0.01	0
	Perfluorodecanoic acid (PFDA)	µg/L	0.02 : 0.01 (Interlab)	<0.02	<0.01	0	<0.02	<0.01	0
	Perfluorododecanoic acid (PFDoDA)	µg/L	0.02 : 0.01 (Interlab)	<0.02	<0.01	0	<0.02	<0.01	0
	Perfluoroheptane sulfonic acid (PFHpS)	µg/L	0.02 : 0.01 (Interlab)	<0.02	<0.01	0	0.07	0.06	15
	Perfluoroheptanoic acid (PFHpA)	µg/L	0.02 : 0.01 (Interlab)	0.04	0.04	0	<0.02	0.02	0
	Perfluorohexanoic acid (PFHxA)	µg/L	0.02 : 0.01 (Interlab)	0.15	0.09	50	0.11	0.09	20
	Perfluorononanoic acid (PFNA)	µg/L	0.02 : 0.01 (Interlab)	<0.02	<0.01	0	<0.02	<0.01	0
	Perfluorooctane sulfonamide (FOSA)	µg/L	0.02 : 0.05 (Interlab)	<0.02	<0.05	0	<0.02	<0.05	0
	Perfluoropentane sulfonic acid (PFPeS)	µg/L	0.02 : 0.01 (Interlab)	0.04	0.02	67	0.12	0.07	53
	Perfluoropentanoic acid (PFPeA)	µg/L	0.02 : 0.01 (Interlab)	0.17	0.11	43	0.02	0.02	0
	Perfluorotetradecanoic acid (PFTeDA)	µg/L	0.05 : 0.01 (Interlab)	<0.05	<0.01	0	<0.05	<0.01	0
	Perfluorotridecanoic acid (PFTrDA)	µg/L	0.02 : 0.01 (Interlab)	<0.02	<0.01	0	<0.02	<0.01	0
	Perfluoroundecanoic acid (PFUnDA)	µg/L	0.02 : 0.01 (Interlab)	<0.02	<0.01	0	<0.02	<0.01	0
	Sum of PFAS	µg/L	0.01 : 0.1 (Interlab)	1.14	0.84	30	3.86	3.54	9
	Sum of PFHxS and PFOS	µg/L	0.01	0.51	0.39	27	3.31	3.04	9
	Perfluorooctane sulfonic acid (PFOS)	µg/L	0.01	0.2	0.16	22	2.37	2.3	3
	Perfluorooctanoic Acid (PFOA)	µg/L	0.01	0.04	0.03	29	0.07	0.05	33
	Perfluorohexane sulfonic acid (PFHxS)	µg/L	0.01	0.31	0.23	30	0.94	0.74	24

*RPDs have only been considered where a concentration is greater than 1 times the EQL.
 **High RPDs are in bold (Acceptable RPDs for each EQL multiplier range are: 200 (1-10 x EQL); 50 (10-20 x EQL); 30 (> 20 x EQL))
 ***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

Lab Report Number	ET2301429	ET2301429	ET2301429	ET2301429	ET2301429
Field ID	0229_QC350_230306	0229_QC302_230308	0229_QC301_230307	0229_QC303_230308	0229_QC353_230308
Sampled_Date/Time	6/03/2023 16:20	8/03/2023 17:00	7/03/2023 16:00	8/03/2023 17:00	8/03/2023 17:10
Sample Type	Rinsate	Rinsate	Rinsate	Rinsate	Rinsate

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

Lab Report Number	ET2301429	ET2301455	ET2301455	ET2301455
Field ID	0229_QC300_230308	0229_QC360_230315	0229_QC351_230307	0229_QC352_230308
Sampled_Date/Time	8/03/2023 17:00	15/03/2023 10:53	7/03/2023 18:00	8/03/2023 18:00
Sample Type	Rinsate	Rinsate	Rinsate	Rinsate

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

Appendix D

Chain of Custody Records



Environmental Division
Townsville
Work Order Reference
ET2301455



Telephone : +61 7 4773 0000

Custody Document for Submissions via ALS Compass App

Project: QUB_0229_PFAASMP_23 Client: ACCOM Project Manager: [Redacted]
 Phone: ([Redacted])
 ALS Compass COC Reference: 49674 # Samples: 7 Sampler: [Redacted]
 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]		[Redacted]
Date / Time: <u>15/3/23</u> <u>1023</u>	Date / Time: <u>15/3/23</u> <u>10:25am</u>	Date / Time:	Date / Time: <u>15/3/23</u> <u>6:00</u>



CHAIN OF CUSTODY

COC#: 49674

ALS Laboratory: ET Townsville

RELINQUISHED BY:

RECEIVED BY:

RELINQUISHED BY:

RECEIVED BY:

DATE TIME:

DATE TIME:

DATE TIME:

DATE TIME:

16:00
15/3/23

CLIENT: AECOMAU - AECOM AUSTRALIA PTY LTD

PROJECT: QLD_0229_PFSOMP_23

SITE: QLD_0229

ORDER NO: 60612487 task 3.1

PROJECT MANAGER:

PRIMARY SAMPLER:

EMAIL REPORTS TO:

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:

CONTACT PH:

SAMPLER MOBILE:

QUOTE NO: TV/007/21 v2 - Compass

/ ET2021AECOMAU000

1

SAMPLE DETAILS

ANALYSIS REQUIRED

SAMPLE	NAME	DESCRIPTION	DATE / TIME	MATRIX	TOTAL BOTTLES	ON HOLD	ANALYSIS REQUIRED			
							Sediments SEDIMENT	Waters WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
001	0229_SW110_230315		15/03/2023 09:03 AM	WATER	ALS: 4 Non ALS: 0	No		Partial 1/4		
002	0229_QC106_230315		15/03/2023 09:04 AM	WATER	ALS: 2 Non ALS: 0	No		Partial 1/4		
003	0229_SD233_230315		15/03/2023 09:53 AM	SOIL	ALS: 1 Non ALS: 0	No	Partial 1/4			
004	0229_QC360_230315		15/03/2023 09:53 AM	WATER	ALS: 2 Non ALS: 0	No		Partial 1/4		
005	0229_QC351_230307		07/03/2023 05:00 PM	WATER	ALS: 2 Non ALS: 0	No		Partial 1/4		
006	0229_QC352_230308		08/03/2023 05:00 PM	WATER	ALS: 2 Non ALS: 0	No		Partial 1/4		
007	0229_QC107_230315		15/03/2023 09:56 AM	SOIL	ALS: 1 Non ALS: 0	No	Partial 1/4			

RELINQUISHED BY:
 DATE TIME:

RECEIVED BY:
 DATE TIME:

RELINQUISHED BY:
 DATE TIME:

RECEIVED BY: *16:00*
 DATE TIME: *15/3/23*

CLIENT: AECOMAU - AECOM AUSTRALIA PTY LTD
 PROJECT: QLD_0229_PFASOMP_23
 SITE: QLD_0229
 ORDER NO: 60612487 task 3.1

TURNAROUND REQUIREMENTS : 5 Days
 Biohazard info:

LABORATORY USE ONLY (Circle)
 Custody Seal intact? Yes No N/A
 Free ice / frozen ice bricks present upon receipt? Yes No N/A

PROJECT MANAGER: [REDACTED]
 PRIMARY SAMPLER: [REDACTED]

CONTACT PH: SAMPLER MOBILE:
 QUOTE NO: TV/007/21 v2 - Compass / ET2021AECOMAU000
 1

Random Sample Temperature on Receipt: C
 Other comments:

EMAIL REPORTS TO: [REDACTED]

EMAIL INVOICES TO: [REDACTED]

SAMPLE	SAMPLE NAME	PARTIAL ANALYSIS GROUP NAME	MATRIX	SELECTED ANALYSIS NAME
001	0229_SW110_230315	Waters WATER	WATER	- EP231X PFAS - Full Suite (28 analytes)
002	0229_QC106_230315	Waters WATER	WATER	- EP231X PFAS - Full Suite (28 analytes)
003	0229_SD233_230315	Sediments SEDIMENT	SOIL	- EP231X (solids) PFAS - Full Suite (28 analytes)
004	0229_QC360_230315	Waters WATER	WATER	- EP231X PFAS - Full Suite (28 analytes)
005	0229_QC351_230307	Waters WATER	WATER	- EP231X PFAS - Full Suite (28 analytes)
006	0229_QC352_230308	Waters WATER	WATER	- EP231X PFAS - Full Suite (28 analytes)
007	0229_QC107_230315	Sediments SEDIMENT	SOIL	- EP231X (solids) PFAS - Full Suite (28 analytes)



CHAIN OF CUSTODY

COC#: 49674

ALS Laboratory: ET Townsville

RELINQUISHED BY:

RECEIVED BY:

RELINQUISHED BY:

RECEIVED BY:

DATE TIME:

DATE TIME:

DATE TIME:

DATE TIME:

15/3/23
16:00

CLIENT: AECOMAU - AECOM AUSTRALIA PTY LTD

PROJECT: QLD_0229_PFSOMP_23

SITE: QLD_0229

ORDER NO: 60612487 task 3.1

PROJECT MANAGER:

PRIMARY SAMPLER:

EMAIL REPORTS TO:

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:

CONTACT PH:

SAMPLER MOBILE:

QUOTE NO: TV/007/21 v2 - Compass

/ ET2021AECOMAU000

1

SAMPLE	SAMPLE NAME	BOTTLE NAME	VOLUME	BARCODE	TYPE	FILTERED	REASON
001	0229_SW110_230315	HDPE (no PTFE)	20 mL	00350522022125	Grey	No	
001	0229_SW110_230315	HDPE (no PTFE)	20 mL	00350522052864	Grey	No	
001	0229_SW110_230315	HDPE (no PTFE)	20 mL	00350522022042	Grey	No	
001	0229_SW110_230315	HDPE (no PTFE)	20 mL	00350522052875	Grey	No	
002	0229_QC106_230315	HDPE (no PTFE)	20 mL	00350821031295	Grey	No	
002	0229_QC106_230315	HDPE (no PTFE)	20 mL	00350821011981	Grey	No	
003	0229_SD233_230315	HDPE Soil Jar	200 mL	00620322093507	Grey	No	
004	0229_QC360_230315	HDPE (no PTFE)	20 mL	00350821031228	Grey	No	
004	0229_QC360_230315	HDPE (no PTFE)	20 mL	00350821031438	Grey	No	
005	0229_QC351_230307	HDPE (no PTFE)	20 mL	00350821031659	Grey	No	
005	0229_QC351_230307	HDPE (no PTFE)	20 mL	00350821031269	Grey	No	
006	0229_QC352_230308	HDPE (no PTFE)	20 mL	00350821031564	Grey	No	
006	0229_QC352_230308	HDPE (no PTFE)	20 mL	00350821011986	Grey	No	
007	0229_QC107_230315	HDPE Soil Jar	200 mL	00620322093490	Grey	No	

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



Environmental Division
Townsville
Work Order Reference
ET2301427



Telephone : + 61 7 4773 0000

Custody Document for Submissions via ALS Compass App

Project: QLD_0229_PFA_SMP_23 Client: AELOM Project Manager: [Redacted]
 Phone: ([Redacted]
 ALS Compass COC Reference: 49609 # Samples: 4 Sampler: [Redacted]
 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:	
[Redacted]		[Redacted]		[Redacted]	
Date / Time:	09:10 14/3/23	Date / Time:	14/3/23 9:15am	Date / Time:	15/3/23 8:30

RELINQUISHED BY:
 DATE TIME:

RECEIVED BY:
 DATE TIME:

RELINQUISHED BY:
 DATE TIME:

RECEIVED BY: [REDACTED]
 DATE TIME: 03/13/23
 2:30

CLIENT: AECOMAU - AECOM AUSTRALIA PTY LTD
 PROJECT: QLD_0229_PFSOMP_23
 SITE: QLD_0229
 ORDER NO: 60612487 task 3.1

TURNAROUND REQUIREMENTS : 5 Days
 Biohazard info:

LABORATORY USE ONLY (Circle)

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

PROJECT MANAGER: [REDACTED] CONTACT PH: SAMPLER MOBILE:
 PRIMARY SAMPLER: [REDACTED] QUOTE NO: TV/007/21 v2 - Compass / ET2021AECOMAU000
 1
 EMAIL REPORTS TO: [REDACTED]
 EMAIL INVOICES TO: [REDACTED]

SAMPLE DETAILS							ANALYSIS REQUIRED			
SAMPLE	NAME	DESCRIPTION	DATE / TIME	MATRIX	TOTAL BOTTLES	ON HOLD	Sediments SEDIMENT	Waters WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
001	0229_SD211_230309		09/03/2023 04:20 PM	SOIL	ALS: 1 Non ALS: 0	No	Partial 1/4			
002	0229_SD212_230309		09/03/2023 04:20 PM	SOIL	ALS: 1 Non ALS: 0	No	Partial 1/4			
003	0229_SW211_230309		09/03/2023 04:20 PM	WATER	ALS: 4 Non ALS: 0	No		Partial 1/4		
004	0229_SW212_230309		09/03/2023 04:40 PM	WATER	ALS: 4 Non ALS: 0	No		Partial 1/4		

RELINQUISHED BY:

RECEIVED BY:

RELINQUISHED BY:

RECEIVED

DATE TIME:

DATE TIME:

DATE TIME:

DATE TIME: 15/3/23
8:30

CLIENT: AECOMAU - AECOM AUSTRALIA PTY LTD

PROJECT: QLD_0229_PFASOMP_23

SITE: QLD_0229

ORDER NO: 60612487 task 3.1

PROJECT MANAGER:

PRIMARY SAMPLER:

EMAIL REPORTS TO:

EMAIL INVOICES TO:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

CONTACT PH:

QUOTE NO: TV/007/21 v2 - Compass

SAMPLER MOBILE:

/ ET2021AECOMAU000
1

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

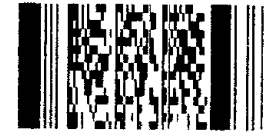
Other comments:

SAMPLE	SAMPLE NAME	BOTTLE NAME	VOLUME	BARCODE	TYPE	FILTERED	REASON
001	0229_SD211_230309	HDPE Soil Jar	200 mL	00620719044283	Grey	No	
002	0229_SD212_230309	HDPE Soil Jar	200 mL	00620719044146	Grey	No	
003	0229_SW211_230309	HDPE (no PTFE)	20 mL	00350019024865	Grey	No	
003	0229_SW211_230309	HDPE (no PTFE)	20 mL	00350019045319	Grey	No	
003	0229_SW211_230309	HDPE (no PTFE)	20 mL	00350821027741	Grey	No	
003	0229_SW211_230309	HDPE (no PTFE)	20 mL	00350821027616	Grey	No	
004	0229_SW212_230309	HDPE (no PTFE)	20 mL	00350522022184	Grey	No	
004	0229_SW212_230309	HDPE (no PTFE)	20 mL	00350522022082	Grey	No	
004	0229_SW212_230309	HDPE (no PTFE)	20 mL	00350522022037	Grey	No	
004	0229_SW212_230309	HDPE (no PTFE)	20 mL	00350522022099	Grey	No	

Total Bottle Count: ALS: 10, Non ALS: 0



Environmental Division
Townsville
Work Order Reference
ET2301428



Telephone : - 61 7 4773 0000

Custody Document for Submissions via ALS Compass App

Project: QLD-0229-PFASOMP-23 Client: AECOM Project Manager: [Redacted]
Phone: [Redacted]

ALS Compass COC Reference: 49610 # Samples: 1 Sampler: [Redacted]
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: [Redacted]	Received by: [Redacted]	Relinquished by:	Received by: [Redacted]
Date / Time: 09:10 14/3/23	Date / Time: 14/3/23 9:15am	Date / Time:	Date / Time: 15/3/23 @ 8:30

RELINQUISHED BY:
 DATE TIME:

RECEIVED BY:
 DATE TIME:

RELINQUISHED BY:
 DATE TIME:

RECEIVED BY:
 DATE TIME: 15/3/23
 8-30

CLIENT: AECOMAU - AECOM AUSTRALIA PTY LTD
 PROJECT: QLD_0229_PFASOMP_23
 SITE: QLD_0229
 ORDER NO: 60612487 task 3.1
 PROJECT MANAGER: [REDACTED]
 PRIMARY SAMPLER: [REDACTED]
 EMAIL REPORTS TO: [REDACTED]
 EMAIL INVOICES TO: [REDACTED]

TURNAROUND REQUIREMENTS : 5 Days
 Biohazard info:

CONTACT PH: SAMPLER MOBILE:
 QUOTE NO: TV/007/21 v2 - Compass / ET2021AECOMAU000
 1

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	Waters WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
001	0229_MW226_230308		08/03/2023 07:45 AM	WATER	ALS: 4 Non ALS: 0	No	Partial 1/4		

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME: 15/3/23 8:30

CLIENT: AECOMAU - AECOM AUSTRALIA PTY LTD
 PROJECT: QLD_0229_PFASOMP_23
 SITE: QLD_0229
 ORDER NO: 60612487 task 3.1
 PROJECT MANAGER: [REDACTED]
 PRIMARY SAMPLER: [REDACTED]
 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:			

CONTACT PH: [REDACTED] SAMPLER MOBILE: [REDACTED]
 QUOTE NO: TV/007/21 v2 - Compass / ET2021AECOMAU0001

SAMPLE	SAMPLE NAME	PARTIAL ANALYSIS GROUP NAME	MATRIX	SELECTED ANALYSIS NAME
001	0229_MW226_230308	Waters WATER	WATER	- EP231X PFAS - Full Suite (28 analytes)

RELINQUISHED BY:
 DATE TIME:

RECEIVED BY:
 DATE TIME:

RELINQUISHED BY:
 DATE TIME:

RECEIVED BY: [Redacted]
 DATE TIME: 5/5/23
 8:30

CLIENT: AECOMAU - AECOM AUSTRALIA PTY LTD
 PROJECT: QLD_0229_PFSOMP_23
 SITE: QLD_0229
 ORDER NO: 60612487 task 3.1

PROJECT MANAGER: [Redacted]
 PRIMARY SAMPLER: [Redacted]

CONTACT PH: SAMPLER MOBILE:
 QUOTE NO: TV/007/21 v2 - Compass / ET2021AECOMAU000
 1

EMAIL REPORTS TO: [Redacted]

EMAIL INVOICES TO: [Redacted]

TURNAROUND REQUIREMENTS : 5 Days
 Biohazard info:

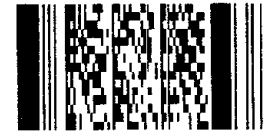
LABORATORY USE ONLY (Circle)
 Custody Seal intact? Yes No N/A
 Free ice / frozen ice bricks present upon receipt? Yes No N/A
 Random Sample Temperature on Receipt: °C
 Other comments:

SAMPLE	SAMPLE NAME	BOTTLE NAME	VOLUME	BARCODE	TYPE	FILTERED	REASON
001	0229_MW226_230308	HDPE (no PTFE)	20 mL	00350821031708	Grey	No	
001	0229_MW226_230308	HDPE (no PTFE)	20 mL	00352010065535	Grey	No	
001	0229_MW226_230308	HDPE (no PTFE)	20 mL	00350821031478	Grey	No	
001	0229_MW226_230308	HDPE (no PTFE)	20 mL	00352010065580	Grey	No	

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



Environmental Division
Townsville
Work Order Reference
ET2301429



Telephone . - 61 7 4773 0000

Custody Document for Submissions via ALS Compass App

Project: QLD-0229-PFA&MP-23 Client: AECOM

Project Manager: _____

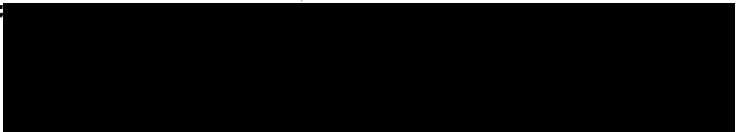
Phone: _____

ALS Compass COC Reference: 49308 # Samples: 109

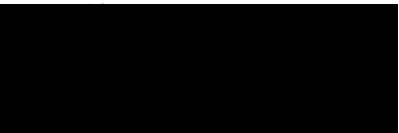
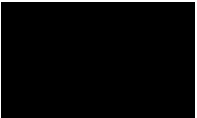
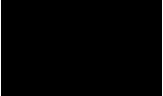
Sampler: _____

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: 	Received by: 	Relinquished by: _____	Received by: 
Date / Time: <u>0910</u> <u>14/3/23</u>	Date / Time: <u>14/3/23 9:15am</u>	Date / Time: _____	Date / Time: <u>15/3/23</u> <u>8:30</u>

RELINQUISHED BY:
 DATE TIME:

RECEIVED BY:
 DATE TIME:

RELINQUISHED BY:
 DATE TIME:

RECEIVED BY: [REDACTED]
 DATE TIME: 15/3/23
 8:30

CLIENT: AECOMAU - AECOM AUSTRALIA PTY LTD
 PROJECT: QLD_0229_PFASOMP_23
 SITE: QLD_0229
 ORDER NO: 60612487 task 3.1
 PROJECT MANAGER: [REDACTED]
 PRIMARY SAMPLER: [REDACTED]
 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:

CONTACT PH: [REDACTED] SAMPLER MOBILE:
 QUOTE NO: TV/007/21 v2 - Compass / ET2021AECOMAU000
 1

SAMPLE DETAILS							ANALYSIS REQUIRED			
SAMPLE	NAME	DESCRIPTION	DATE / TIME	MATRIX	TOTAL BOTTLES	ON HOLD	Sediments SEDIMENT	Waters WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
001	0229_MW220S_230307		07/03/2023 01:09 PM	WATER	ALS: 4 Non ALS: 0	No		Partial 1/4		
002	0229_MW233_230307		07/03/2023 02:01 PM	WATER	ALS: 4 Non ALS: 0	No		Partial 1/4		
003	0229_MW212_230307		07/03/2023 02:16 PM	WATER	ALS: 4 Non ALS: 0	No		Partial 1/4		
004	0229_SW132_230306	Surface water	06/03/2023 03:38 PM	WATER	ALS: 4 Non ALS: 0	No		Partial 1/4		
005	0229_SW140_230306		06/03/2023 02:45 PM	WATER	ALS: 4 Non ALS: 0	No		Partial 1/4		
006	0229_SW133_230306		06/03/2023 01:17 PM	WATER	ALS: 4 Non ALS: 0	No		Partial 1/4		
007	0229_SW136_230306		06/03/2023 11:23 AM	WATER	ALS: 4 Non ALS: 0	No		Partial 1/4		
008	0229_SW109_230306		06/03/2023 01:40 PM	WATER	ALS: 4 Non ALS: 0	No		Partial 1/4		
009	0229_SW139_230306		06/03/2023 02:16 PM	WATER	ALS: 4 Non ALS: 0	No		Partial 1/4		

RELINQUISHED BY:
 DATE TIME:

RECEIVED BY:
 DATE TIME:

RELINQUISHED BY:
 DATE TIME:

RECEIVED BY: [Redacted]
 DATE TIME: 15/3/23

CLIENT: AECOMAU - AECOM AUSTRALIA PTY LTD

PROJECT: QLD_0229_PFSOMP_23

SITE: QLD_0229

ORDER NO: 60612487 task 3.1

PROJECT MANAGER: [Redacted]
 PRIMARY SAMPLER: [Redacted]

CONTACT PH: [Redacted] SAMPLER MOBILE: [Redacted]
 QUOTE NO: TV/007/21 v2 - Compass / ET2021AECOMAU0001

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	Sediments SEDIMENT	Waters WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
010	0229_SW217_230306		06/03/2023 03:00 PM	WATER	ALS: 4 Non ALS: 0	No		Partial 1/4		
011	0229_SW233_230306		06/03/2023 03:48 PM	WATER	ALS: 4 Non ALS: 0	No		Partial 1/4		
012	0229_SW135_230306		06/03/2023 12:00 PM	WATER	ALS: 4 Non ALS: 0	No		Partial 1/4		
013	0229_SW128_230306		06/03/2023 04:10 AM	WATER	ALS: 4 Non ALS: 0	No		Partial 1/4		
014	0229_SW203_230306		06/03/2023 04:30 PM	WATER	ALS: 4 Non ALS: 0	No		Partial 1/4		
015	0229_QC150_230306		06/03/2023 11:23 AM	WATER	ALS: 2 Non ALS: 0	No		Partial 1/4		
016	0229_QC350_230306		06/03/2023 04:20 PM	WATER	ALS: 2 Non ALS: 0	No		Partial 1/4		
017	0229_QC100_230306		06/03/2023 03:00 PM	WATER	ALS: 4 Non ALS: 0	No		Partial 1/4		
018	0229_QC152_230306		06/03/2023 01:30 PM	WATER	ALS: 2 Non ALS: 0	No		Partial 1/4		

RELINQUISHED BY:
 DATE TIME:

RECEIVED BY:
 DATE TIME:

RELINQUISHED BY:
 DATE TIME:

RECEIVED BY: [Redacted]
 DATE TIME: 06/03/23
 [Signature]

CLIENT: AECOMAU - AECOM AUSTRALIA PTY LTD
 PROJECT: QLD_0229_PFSOMP_23
 SITE: QLD_0229
 ORDER NO: 60612487 task 3.1

TURNAROUND REQUIREMENTS : 5 Days
 Biohazard info:

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

PROJECT MANAGER: [Redacted]
 PRIMARY SAMPLER: [Redacted]

CONTACT PH: [Redacted] SAMPLER MOBILE:
 QUOTE NO: TV/007/21 v2 - Compass / ET2021AECOMAU000
 1

EMAIL REPORTS TO: [Redacted]

EMAIL INVOICES TO: [Redacted]

SAMPLE DETAILS							ANALYSIS REQUIRED			
SAMPLE	NAME	DESCRIPTION	DATE / TIME	MATRIX	TOTAL BOTTLES	ON HOLD	Sediments SEDIMENT	Waters WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
019	0229_SW129_230306		06/03/2023 01:30 PM	WATER	ALS: 4 Non ALS: 0	No		Partial 1/4		
020	0229_SD121_230306		06/03/2023 11:40 AM	SOIL	ALS: 1 Non ALS: 0	No	Partial 1/4			
021	0229_SD136_230306		06/03/2023 11:23 AM	SOIL	ALS: 1 Non ALS: 0	No	Partial 1/4			
022	0229_SD110_230306		06/03/2023 02:10 PM	SOIL	ALS: 1 Non ALS: 0	No	Partial 1/4			
023	0229_SD120_230306		06/03/2023 12:20 PM	SOIL	ALS: 1 Non ALS: 0	No	Partial 1/4			
024	0229_SD133_230306		06/03/2023 01:15 PM	SOIL	ALS: 1 Non ALS: 0	No	Partial 1/4			
025	0229_SD140_230306		06/03/2023 02:40 PM	SOIL	ALS: 1 Non ALS: 0	No	Partial 1/4			
026	0229_SD139_230306		06/03/2023 02:15 PM	SOIL	ALS: 1 Non ALS: 0	No	Partial 1/4			
027	0229_QC151_230306		06/03/2023 11:23 AM	SOIL	ALS: 1 Non ALS: 0	No	Partial 1/4			

RELINQUISHED BY:
 DATE TIME:

RECEIVED BY:
 DATE TIME:

RELINQUISHED BY:
 DATE TIME:

RECEIVED BY: [REDACTED]
 DATE TIME: 15/3/23
 8:30

CLIENT: AECOMAU - AECOM AUSTRALIA PTY LTD
 PROJECT: QLD_0229_PFSOMP_23
 SITE: QLD_0229
 ORDER NO: 60612487 task 3.1
 PROJECT MANAGER: [REDACTED]
 PRIMARY SAMPLER: [REDACTED]
 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:

CONTACT PH: [REDACTED] SAMPLER MOBILE:
 QUOTE NO: TV/007/21 v2 - Compass / ET2021AECOMAU000
 1

SAMPLE DETAILS							ANALYSIS REQUIRED			
SAMPLE	NAME	DESCRIPTION	DATE / TIME	MATRIX	TOTAL BOTTLES	ON HOLD	Sediments SEDIMENT	Waters WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
028	0229_SD135_230306		06/03/2023 12:05 PM	SOIL	ALS: 1 Non ALS: 0	No	Partial 1/4			
029	0229_SD109_230306		06/03/2023 01:37 PM	SOIL	ALS: 1 Non ALS: 0	No	Partial 1/4			
030	0229_SD217_230306		06/03/2023 03:00 PM	SOIL	ALS: 1 Non ALS: 0	No	Partial 1/4			
031	0229_SD129_230306		06/03/2023 01:30 PM	SOIL	ALS: 1 Non ALS: 0	No	Partial 1/4			
032	0229_QC153_230306		06/03/2023 01:30 PM	SOIL	ALS: 1 Non ALS: 0	No	Partial 1/4			
033	0229_SD132_230306		06/03/2023 01:15 PM	SOIL	ALS: 1 Non ALS: 0	No	Partial 1/4			
034	0229_SD128_230306		06/03/2023 04:10 PM	SOIL	ALS: 1 Non ALS: 0	No	Partial 1/4			
035	0229_MW119_230307		07/03/2023 04:40 PM	WATER	ALS: 4 Non ALS: 0	No		Partial 1/4		
036	0229_MW125_230308		08/03/2023 11:00 PM	WATER	ALS: 4 Non ALS: 0	No		Partial 1/4		

RELINQUISHED BY:

RECEIVED BY:

RELINQUISHED BY:

RECEIVED BY:

DATE TIME:

DATE TIME:

DATE TIME:

DATE TIME: 08/13/23
8:20

CLIENT: AECOMAU - AECOM AUSTRALIA PTY LTD

PROJECT: QLD_0229_PFASOMP_23

SITE: QLD_0229

ORDER NO: 60612487 task 3.1

PROJECT MANAGER:
 PRIMARY SAMPLER:

CONTACT PH: SAMPLER MOBILE:
 QUOTE NO: TV/007/21 v2 - Compass / ET2021AECOMAU000
 1

EMAIL REPORTS TO:

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	ANALYSIS REQUIRED			
							Sediments SEDIMENT	Waters WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
037	0229_MW115_230308		08/03/2023 02:55 PM	WATER	ALS: 2 Non ALS: 0	No		Partial 1/4		
038	0229_MW205S_230308		08/03/2023 03:10 PM	WATER	ALS: 4 Non ALS: 0	No		Partial 1/4		
039	0229_MW125S_230308		08/03/2023 10:45 AM	WATER	ALS: 4 Non ALS: 0	No		Partial 1/4		
040	0229_MW002_230308		08/03/2023 02:34 PM	WATER	ALS: 2 Non ALS: 0	No		Partial 1/4		
041	0229_MW235S_230308		08/03/2023 04:00 PM	WATER	ALS: 4 Non ALS: 0	No		Partial 1/4		
042	0229_MW217_230308		08/03/2023 02:30 PM	WATER	ALS: 4 Non ALS: 0	No		Partial 1/4		
043	0229_SW126_230308		08/03/2023 03:48 PM	WATER	ALS: 4 Non ALS: 0	No		Partial 1/4		
044	0229_MW003_230308		08/03/2023 12:00 PM	WATER	ALS: 4 Non ALS: 0	No		Partial 1/4		
045	0229_MW065_230308		08/03/2023 03:00 PM	WATER	ALS: 4 Non ALS: 0	No		Partial 1/4		

RELINQUISHED BY:
 DATE TIME:

RECEIVED BY:
 DATE TIME:

RELINQUISHED BY:
 DATE TIME:

RECEIVED BY: [REDACTED]
 DATE TIME: 15/3/23
 8:30

CLIENT: AECOMAU - AECOM AUSTRALIA PTY LTD
 PROJECT: QLD_0229_PFSOMP_23
 SITE: QLD_0229
 ORDER NO: 60612487 task 3.1

PROJECT MANAGER: [REDACTED]
 PRIMARY SAMPLER: [REDACTED]

CONTACT PH: [REDACTED] SAMPLER MOBILE:
 QUOTE NO: TV/007/21 v2 - Compass / ET2021AECOMAU000
 1

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	Sediments SEDIMENT	Waters WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
046	0229_MW122_230308		08/03/2023 12:50 PM	WATER	ALS: 4 Non ALS: 0	No		Partial 1/4		
047	0229_SW134_230308		08/03/2023 09:30 AM	WATER	ALS: 4 Non ALS: 0	No		Partial 1/4		
048	0229_SW227_230308		08/03/2023 12:05 PM	WATER	ALS: 4 Non ALS: 0	No		Partial 1/4		
049	0229_MW123S_230308		08/03/2023 12:30 PM	WATER	ALS: 4 Non ALS: 0	No		Partial 1/4		
050	0229_MW120_230308		08/03/2023 02:11 PM	WATER	ALS: 2 Non ALS: 0	No		Partial 1/4		
051	0229_SW244_230308		08/03/2023 11:15 PM	WATER	ALS: 4 Non ALS: 0	No		Partial 1/4		
052	0229_MW124_230308		08/03/2023 11:45 AM	WATER	ALS: 4 Non ALS: 0	No		Partial 1/4		
053	0229_QC302_230308		08/03/2023 05:00 PM	WATER	ALS: 2 Non ALS: 0	No		Partial 1/4		
054	0229_QC101_230308		08/03/2023 04:00 PM	WATER	ALS: 2 Non ALS: 0	No		Partial 1/4		

RELINQUISHED BY:

RECEIVED BY:

RELINQUISHED BY:

RECEIVED

DATE TIME:

DATE TIME:

DATE TIME:

DATE TIME: 15/3/23
 4:36

CLIENT: AECOMAU - AECOM AUSTRALIA PTY LTD

PROJECT: QLD_0229_PFSOMP_23

SITE: QLD_0229

ORDER NO: 60612487 task 3.1

PROJECT MANAGER:

PRIMARY SAMPLER:

CONTACT PH:

SAMPLER MOBILE:

QUOTE NO: TV/007/21 v2 - Compass

/ ET2021AECOMAU000
 1

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

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

Random Sample Temperature on Receipt: C

Other comments:

EMAIL REPORTS TO:

EMAIL INVOICES TO:

SAMPLE DETAILS

ANALYSIS REQUIRED

SAMPLE	NAME	DESCRIPTION	DATE / TIME	MATRIX	TOTAL BOTTLES	ON HOLD	ANALYSIS REQUIRED			
							Sediments SEDIMENT	Waters WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
055	0229_QC154_230308		08/03/2023 02:00 PM	WATER	ALS: 4 Non ALS: 0	No		Partial 1/4		
056	0229_MW121_230308		08/03/2023 01:40 PM	WATER	ALS: 2 Non ALS: 0	No		Partial 1/4		
057	0229_QC301_230307		07/03/2023 04:00 PM	WATER	ALS: 4 Non ALS: 0	No		Partial 1/4		
058	0229_MW236S_230308		08/03/2023 03:50 PM	WATER	ALS: 4 Non ALS: 0	No		Partial 1/4		
059	0229_SW130_230308		08/03/2023 09:50 PM	WATER	ALS: 4 Non ALS: 0	No		Partial 1/4		
060	0229_QC303_230308		08/03/2023 05:00 PM	WATER	ALS: 2 Non ALS: 0	No		Partial 1/4		
061	0229_MW123I_230308		08/03/2023 12:15 PM	WATER	ALS: 4 Non ALS: 0	No		Partial 1/4		
062	0229_SD130_230308		08/03/2023 09:48 AM	SOIL	ALS: 1 Non ALS: 0	No	Partial 1/4			
063	0229_SD126_230308		08/03/2023 10:05 AM	SOIL	ALS: 1 Non ALS: 0	No	Partial 1/4			

RELINQUISHED BY:
 DATE TIME:

RECEIVED BY:
 DATE TIME:

RELINQUISHED BY:
 DATE TIME:

RECEIVED BY: [Redacted]
 DATE TIME: 15/3/23
 8:30

CLIENT: AECOMAU - AECOM AUSTRALIA PTY LTD
 PROJECT: QLD_0229_PFASOMP_23
 SITE: QLD_0229
 ORDER NO: 60612487 task 3.1

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

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

PROJECT MANAGER: [Redacted]
 PRIMARY SAMPLER: [Redacted]

CONTACT PH: [Redacted] SAMPLER MOBILE: [Redacted]
 QUOTE NO: TV/007/21 v2 - Compass / ET2021AECOMAU0001

EMAIL REPORTS TO: [Redacted]

EMAIL INVOICES TO: [Redacted]

SAMPLE DETAILS							ANALYSIS REQUIRED			
SAMPLE	NAME	DESCRIPTION	DATE / TIME	MATRIX	TOTAL BOTTLES	ON HOLD	Sediments SEDIMENT	Waters WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
064	0229_SD227_230308		08/03/2023 12:10 PM	SOIL	ALS: 1 Non ALS: 0	No	Partial 1/4			
065	0229_SD134_230308		08/03/2023 09:30 AM	SOIL	ALS: 1 Non ALS: 0	No	Partial 1/4			
066	0229_SD244_230308		08/03/2023 11:10 AM	SOIL	ALS: 1 Non ALS: 0	No	Partial 1/4			
067	0229_SD232_230309		09/03/2023 04:24 PM	SOIL	ALS: 1 Non ALS: 0	No	Partial 1/4			
068	0229_SD220_230309		09/03/2023 09:00 AM	SOIL	ALS: 1 Non ALS: 0	No	Partial 1/4			
069	0229_SD242_230309		09/03/2023 09:30 AM	SOIL	ALS: 1 Non ALS: 0	No	Partial 1/4			
070	0229_SD205_230309		09/03/2023 12:00 PM	SOIL	ALS: 1 Non ALS: 0	No	Partial 1/4			
071	0229_SW232_230309		09/03/2023 09:50 AM	WATER	ALS: 4 Non ALS: 0	No		Partial 1/4		
072	0229_MW232_230309		09/03/2023 10:05 AM	WATER	ALS: 4 Non ALS: 0	No		Partial 1/4		

CLIENT: AECOMAU - AECOM AUSTRALIA PTY LTD
 PROJECT: QLD_0229_PFSOMP_23
 SITE: QLD_0229
 ORDER NO: 60612487 task 3.1

PROJECT MANAGER: [REDACTED]
 PRIMARY SAMPLER: [REDACTED]

EMAIL REPORTS TO: [REDACTED]

EMAIL INVOICES TO: [REDACTED]

RELINQUISHED BY:
 DATE TIME:

RECEIVED BY:
 DATE TIME:

RELINQUISHED BY:
 DATE TIME:

RECEIVED [REDACTED]
 DATE TIME: 15/3/23
 YS30

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:

CONTACT PH: SAMPLER MOBILE:
 QUOTE NO: TV/007/21 v2 - Compass / ET2021AECOMAU000
 1

SAMPLE DETAILS							ANALYSIS REQUIRED			
SAMPLE	NAME	DESCRIPTION	DATE / TIME	MATRIX	TOTAL BOTTLES	ON HOLD	Sediments SEDIMENT	Waters WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
073	0229_MW138_230309		09/03/2023 09:30 AM	WATER	ALS: 4 Non ALS: 0	No		Partial 1/4		
074	0229_MW118_230309		09/03/2023 11:50 AM	WATER	ALS: 4 Non ALS: 0	No		Partial 1/4		
075	0229_MW105_230309		09/03/2023 10:56 AM	WATER	ALS: 4 Non ALS: 0	No		Partial 1/4		
076	0229_SW205_230309		09/03/2023 12:00 PM	WATER	ALS: 4 Non ALS: 0	No		Partial 1/4		
077	0229_QC103_230309		09/03/2023 11:50 AM	WATER	ALS: 4 Non ALS: 0	No		Partial 1/4		
078	0229_QC102_230309		09/03/2023 10:30 AM	WATER	ALS: 4 Non ALS: 0	No		Partial 1/4		
079	0229_SW242_230309		09/03/2023 09:25 AM	WATER	ALS: 4 Non ALS: 0	No		Partial 1/4		
080	0229_QC353_230308		08/03/2023 05:10 PM	WATER	ALS: 2 Non ALS: 0	No		Partial 1/4		
081	0229_MW101_230309		09/03/2023 09:49 AM	WATER	ALS: 4 Non ALS: 0	No		Partial 1/4		

RELINQUISHED BY:

RECEIVED BY:

RELINQUISHED BY:

RECEIVED BY:

DATE TIME:

DATE TIME:

DATE TIME:

DATE TIME: 15/03/2023

CLIENT: AECOMAU - AECOM AUSTRALIA PTY LTD

PROJECT: QLD_0229_PFASOMP_23

SITE: QLD_0229

ORDER NO: 60612487 task 3.1

PROJECT MANAGER:

PRIMARY SAMPLER:

CONTACT PH:

QUOTE NO: TV/007/21 v2 - Compass

SAMPLER MOBILE:

/ ET2021AECOMAU000
1

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

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

Random Sample Temperature on Receipt: °C

Other comments:

EMAIL REPORTS TO:

EMAIL INVOICES TO:

SAMPLE DETAILS

ANALYSIS REQUIRED

SAMPLE	NAME	DESCRIPTION	DATE / TIME	MATRIX	TOTAL BOTTLES	ON HOLD	Sediments SEDIMENT	Waters WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
082	0229_MW114_230309		09/03/2023 11:30 AM	WATER	ALS: 4 Non ALS: 0	No		Partial 1/4		
083	0229_MW128_230309		09/03/2023 10:28 AM	WATER	ALS: 4 Non ALS: 0	No		Partial 1/4		
084 SNR	0229_QC104_230309		09/03/2023 11:30 PM	WATER	ALS: 4 Non ALS: 0	No		Partial 1/4		
085	0229_MW102_230309		09/03/2023 10:00 AM	WATER	ALS: 4 Non ALS: 0	No		Partial 1/4		
086	0229_QC104_230309		09/03/2023 10:30 AM	WATER	ALS: 2 Non ALS: 0	No		Partial 1/4		
087	0229_SW220_230309		09/03/2023 09:00 AM	WATER	ALS: 4 Non ALS: 0	No		Partial 1/4		
088	0229_SW243_230309		09/03/2023 09:30 AM	WATER	ALS: 4 Non ALS: 0	No		Partial 1/4		
089	0229_SD243_230309		09/03/2023 10:50 AM	SOIL	ALS: 1 Non ALS: 0	No	Partial 1/4			
090	0229_MW131_230309		09/03/2023 02:10 PM	WATER	ALS: 4 Non ALS: 0	No		Partial 1/4		

RELINQUISHED BY:
 DATE TIME:

RECEIVED BY:
 DATE TIME:

RELINQUISHED BY:
 DATE TIME:

RECEIVED BY: [Redacted]
 DATE TIME: 5/3/23
 8:30

CLIENT: AECOMAU - AECOM AUSTRALIA PTY LTD
 PROJECT: QLD_0229_PFSOMP_23
 SITE: QLD_0229
 ORDER NO: 60612487 task 3.1
 PROJECT MANAGER: [Redacted]
 PRIMARY SAMPLER: [Redacted]
 EMAIL REPORTS TO: [Redacted]
 EMAIL INVOICES TO: [Redacted]

TURNAROUND REQUIREMENTS : 5 Days
 Biohazard info:

CONTACT PH: SAMPLER MOBILE:
 QUOTE NO: TV/007/21 v2 - Compass / ET2021AECOMAU000
 1

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	Sediments SEDIMENT	Waters WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
091	0229_MW018_230309		09/03/2023 01:10 PM	WATER	ALS: 4 Non ALS: 0	No		Partial 1/4		
092	0229_MW072_230309		09/03/2023 02:20 PM	WATER	ALS: 4 Non ALS: 0	No		Partial 1/4		
093	0229_MW106_230309		09/03/2023 01:45 PM	WATER	ALS: 4 Non ALS: 0	No		Partial 1/4		
094	0229_MW141_230309		09/03/2023 03:00 PM	WATER	ALS: 4 Non ALS: 0	No		Partial 1/4		
095	0229_MW139_230309		09/03/2023 03:45 PM	WATER	ALS: 4 Non ALS: 0	No		Partial 1/4		
096	0229_MW074_230309		09/03/2023 02:45 PM	WATER	ALS: 4 Non ALS: 0	No		Partial 1/4		
097	0229_MW135_230309		09/03/2023 01:30 PM	WATER	ALS: 4 Non ALS: 0	No		Partial 1/4		
098	0229_SW113_230310		10/03/2023 02:50 PM	WATER	ALS: 2 Non ALS: 0	No		Partial 1/4		
099	0229_SW119_230310		10/03/2023 01:15 PM	WATER	ALS: 3 Non ALS: 0	No		Partial 1/4		

RELINQUISHED BY:
 DATE TIME:

RECEIVED BY:
 DATE TIME:

RELINQUISHED BY:
 DATE TIME:

RECEIVED BY: [REDACTED]
 DATE TIME: 15/3/23
 8:30

CLIENT: AECOMAU - AECOM AUSTRALIA PTY LTD
 PROJECT: QLD_0229_PFASOMP_23
 SITE: QLD_0229
 ORDER NO: 60612487 task 3.1

PROJECT MANAGER: [REDACTED]
 PRIMARY SAMPLER: [REDACTED]
 EMAIL REPORTS TO: [REDACTED]
 EMAIL INVOICES TO: [REDACTED]

CONTACT PH: [REDACTED] SAMPLER MOBILE: [REDACTED]
 QUOTE NO: TV/007/21 v2 - Compass / ET2021AECOMAU000
 1

TURNAROUND REQUIREMENTS : 5 Days
 Biohazard info:

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

SAMPLE DETAILS							ANALYSIS REQUIRED			
SAMPLE	NAME	DESCRIPTION	DATE / TIME	MATRIX	TOTAL BOTTLES	ON HOLD	Sediments SEDIMENT	Waters WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
100	0229_SW144_230310		10/03/2023 03:20 PM	WATER	ALS: 2 Non ALS: 0	No		Partial 1/4		
101	0229_MW116_230310		10/03/2023 01:50 PM	WATER	ALS: 2 Non ALS: 0	No		Partial 1/4		
102	0229_SD144_230310		10/03/2023 03:20 PM	SOIL	ALS: 1 Non ALS: 0	No	Partial 1/4			
103	0229_SD113_230310		10/03/2023 02:50 PM	SOIL	ALS: 1 Non ALS: 0	No	Partial 1/4			
104	0229_SD119_230310		10/03/2023 01:15 PM	SOIL	ALS: 1 Non ALS: 0	No	Partial 1/4			
105	0229_SW245_220308		08/03/2023 09:50 AM	WATER	ALS: 4 Non ALS: 0	No		Partial 1/4		
106	0229_SD203_230308		08/03/2023 04:50 PM	SOIL	ALS: 1 Non ALS: 0	No	Partial 1/4			
107	0229_SD245_230308		08/03/2023 09:55 AM	SOIL	ALS: 1 Non ALS: 0	No	Partial 1/4			
108	0229_QC105_230306		06/03/2023 03:00 PM	SOIL	ALS: 1 Non ALS: 0	No	Partial 1/4			

RELINQUISHED BY:
 DATE TIME:

RECEIVED BY:
 DATE TIME:

RELINQUISHED BY:
 DATE TIME:

RECEIVED BY: [REDACTED]
 DATE TIME: 15/3/23
 4/30

CLIENT: AECOMAU - AECOM AUSTRALIA PTY LTD
 PROJECT: QLD_0229_PFASOMP_23
 SITE: QLD_0229
 ORDER NO: 60612487 task 3.1
 PROJECT MANAGER: [REDACTED]
 PRIMARY SAMPLER: [REDACTED]
 EMAIL REPORTS TO: [REDACTED]
 EMAIL INVOICES TO: [REDACTED]

TURNAROUND REQUIREMENTS : 5 Days
 Biohazard info:

CONTACT PH: SAMPLER MOBILE:
 QUOTE NO: TV/007/21 v2 - Compass / ET2021AECOMAU000
 1

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	Sediments SEDIMENT	Waters WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
109	0229_QC300_230308		08/03/2023 05:00 PM	WATER	ALS: 4 Non ALS: 0	No		Partial 1/4		

RELINQUISHED BY:

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RELINQUISHED BY:

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DATE TIME:

DATE TIME:

DATE TIME:

DATE TIME: 15/3/23
8226

CLIENT: AECOMAU - AECOM AUSTRALIA PTY LTD

PROJECT: QLD_0229_PFASOMP_23

SITE: QLD_0229

ORDER NO: 60612487 task 3.1

PROJECT MANAGER:

PRIMARY SAMPLER:

EMAIL REPORTS TO:

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:

CONTACT PH:

SAMPLER MOBILE:

QUOTE NO: TV/007/21 v2 - Compass / ET2021AECOMAU000
1

SAMPLE	SAMPLE NAME	PARTIAL ANALYSIS GROUP NAME	MATRIX	SELECTED ANALYSIS NAME
001	0229_MW220S_230307	Waters WATER	WATER	- EP231X PFAS - Full Suite (28 analytes)
002	0229_MW233_230307	Waters WATER	WATER	- EP231X PFAS - Full Suite (28 analytes)
003	0229_MW212_230307	Waters WATER	WATER	- EP231X PFAS - Full Suite (28 analytes)
004	0229_SW132_230306	Waters WATER	WATER	- EP231X PFAS - Full Suite (28 analytes)
005	0229_SW140_230306	Waters WATER	WATER	- EP231X PFAS - Full Suite (28 analytes)
006	0229_SW133_230306	Waters WATER	WATER	- EP231X PFAS - Full Suite (28 analytes)
007	0229_SW136_230306	Waters WATER	WATER	- EP231X PFAS - Full Suite (28 analytes)
008	0229_SW109_230306	Waters WATER	WATER	- EP231X PFAS - Full Suite (28 analytes)
009	0229_SW139_230306	Waters WATER	WATER	- EP231X PFAS - Full Suite (28 analytes)
010	0229_SW217_230306	Waters WATER	WATER	- EP231X PFAS - Full Suite (28 analytes)
011	0229_SW233_230306	Waters WATER	WATER	- EP231X PFAS - Full Suite (28 analytes)
012	0229_SW135_230306	Waters WATER	WATER	- EP231X PFAS - Full Suite (28 analytes)
013	0229_SW128_230306	Waters WATER	WATER	- EP231X PFAS - Full Suite (28 analytes)
014	0229_SW203_230306	Waters WATER	WATER	- EP231X PFAS - Full Suite (28 analytes)
015	0229_QC150_230306	Waters WATER	WATER	- EP231X PFAS - Full Suite (28 analytes)

RELINQUISHED BY:
 DATE TIME:

RECEIVED BY:
 DATE TIME:

RELINQUISHED BY:
 DATE TIME:

RECEIVED [Redacted]
 DATE TIME: 15/3/23
 8:20

CLIENT: AECOMAU - AECOM AUSTRALIA PTY LTD
 PROJECT: QLD_0229_PFASOMP_23
 SITE: QLD_0229
 ORDER NO: 60612487 task 3.1
 PROJECT MANAGER: [Redacted]
 PRIMARY SAMPLER: [Redacted]
 EMAIL REPORTS TO: [Redacted]
 EMAIL INVOICES TO: [Redacted]

TURNAROUND REQUIREMENTS : 5 Days
 Biohazard info:

CONTACT PH: SAMPLER MOBILE:
 QUOTE NO: TV/007/21 v2 - Compass / ET2021AECOMAU000
 1

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	0229_QC350_230306	Waters WATER	WATER	- EP231X PFAS - Full Suite (28 analytes)
017	0229_QC100_230306	Waters WATER	WATER	- EP231X PFAS - Full Suite (28 analytes)
018	0229_QC152_230306	Waters WATER	WATER	- EP231X PFAS - Full Suite (28 analytes)
019	0229_SW129_230306	Waters WATER	WATER	- EP231X PFAS - Full Suite (28 analytes)
020	0229_SD121_230306	Sediments SEDIMENT	SOIL	- EP231X (solids) PFAS - Full Suite (28 analytes)
021	0229_SD136_230306	Sediments SEDIMENT	SOIL	- EP231X (solids) PFAS - Full Suite (28 analytes)
022	0229_SD110_230306	Sediments SEDIMENT	SOIL	- EP231X (solids) PFAS - Full Suite (28 analytes)
023	0229_SD120_230306	Sediments SEDIMENT	SOIL	- EP231X (solids) PFAS - Full Suite (28 analytes)
024	0229_SD133_230306	Sediments SEDIMENT	SOIL	- EP231X (solids) PFAS - Full Suite (28 analytes)
025	0229_SD140_230306	Sediments SEDIMENT	SOIL	- EP231X (solids) PFAS - Full Suite (28 analytes)
026	0229_SD139_230306	Sediments SEDIMENT	SOIL	- EP231X (solids) PFAS - Full Suite (28 analytes)
027	0229_QC151_230306	Sediments SEDIMENT	SOIL	- EP231X (solids) PFAS - Full Suite (28 analytes)
028	0229_SD135_230306	Sediments SEDIMENT	SOIL	- EP231X (solids) PFAS - Full Suite (28 analytes)
029	0229_SD109_230306	Sediments SEDIMENT	SOIL	- EP231X (solids) PFAS - Full Suite (28 analytes)
030	0229_SD217_230306	Sediments SEDIMENT	SOIL	- EP231X (solids) PFAS - Full Suite (28 analytes)
031	0229_SD129_230306	Sediments SEDIMENT	SOIL	- EP231X (solids) PFAS - Full Suite (28 analytes)

RELINQUISHED BY:

RECEIVED BY:

RELINQUISHED BY:

RECEIVED BY: [Redacted]

DATE TIME:

DATE TIME:

DATE TIME:

DATE TIME: 15/3/23
 [Signature]

CLIENT: AECOMAU - AECOM AUSTRALIA PTY LTD

PROJECT: QLD_0229_PFASOMP_23

SITE: QLD_0229

ORDER NO: 60612487 task 3.1

PROJECT MANAGER: [Redacted]

PRIMARY SAMPLER: [Redacted]

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:

CONTACT PH:

SAMPLER MOBILE:

QUOTE NO: TV/007/21 v2 - Compass / ET2021AECOMAU000
 1

032	0229_QC130_230308	Sediments SEDIMENT	SOIL	- EP231X (solids) PFAS - Full Suite (28 analytes)
033	0229_SD132_230306	Sediments SEDIMENT	SOIL	- EP231X (solids) PFAS - Full Suite (28 analytes)
034	0229_SD128_230306	Sediments SEDIMENT	SOIL	- EP231X (solids) PFAS - Full Suite (28 analytes)
035	0229_MW119_230307	Waters WATER	WATER	- EP231X PFAS - Full Suite (28 analytes)
036	0229_MW125I_230308	Waters WATER	WATER	- EP231X PFAS - Full Suite (28 analytes)
037	0229_MW115_230308	Waters WATER	WATER	- EP231X PFAS - Full Suite (28 analytes)
038	0229_MW205S_230308	Waters WATER	WATER	- EP231X PFAS - Full Suite (28 analytes)
039	0229_MW125S_230308	Waters WATER	WATER	- EP231X PFAS - Full Suite (28 analytes)
040	0229_MW002_230308	Waters WATER	WATER	- EP231X PFAS - Full Suite (28 analytes)
041	0229_MW235S_230308	Waters WATER	WATER	- EP231X PFAS - Full Suite (28 analytes)
042	0229_MW217_230308	Waters WATER	WATER	- EP231X PFAS - Full Suite (28 analytes)
043	0229_SW126_230308	Waters WATER	WATER	- EP231X PFAS - Full Suite (28 analytes)
044	0229_MW003_230308	Waters WATER	WATER	- EP231X PFAS - Full Suite (28 analytes)
045	0229_MW065_230308	Waters WATER	WATER	- EP231X PFAS - Full Suite (28 analytes)
046	0229_MW122_230308	Waters WATER	WATER	- EP231X PFAS - Full Suite (28 analytes)
047	0229_SW134_230308	Waters WATER	WATER	- EP231X PFAS - Full Suite (28 analytes)



CHAIN OF CUSTODY

COC#: 49308

ALS Laboratory: ET Townsville

RELINQUISHED BY:

RECEIVED BY:

RELINQUISHED BY:

RECEIVED

DATE TIME:

DATE TIME:

DATE TIME:

DATE TIME: 05/21/23
08:30

CLIENT: AECOMAU - AECOM AUSTRALIA PTY LTD

PROJECT: QLD_0229_PFASOMP_23

SITE: QLD_0229

ORDER NO: 60612487 task 3.1

PROJECT MANAGER:

PRIMARY SAMPLER:

EMAIL REPORTS TO:

EMAIL INVOICES TO:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

CONTACT PH:

QUOTE NO: TV/007/21 v2 - Compass

SAMPLER MOBILE:

/ ET2021AECOMAU000
1

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:

048	0229_SW227_230308	Waters WATER	WATER	- EP231X PFAS - Full Suite (28 analytes)
049	0229_MW123S_230308	Waters WATER	WATER	- EP231X PFAS - Full Suite (28 analytes)
050	0229_MW120_230308	Waters WATER	WATER	- EP231X PFAS - Full Suite (28 analytes)
051	0229_SW244_230308	Waters WATER	WATER	- EP231X PFAS - Full Suite (28 analytes)
052	0229_MW124_230308	Waters WATER	WATER	- EP231X PFAS - Full Suite (28 analytes)
053	0229_QC302_230308	Waters WATER	WATER	- EP231X PFAS - Full Suite (28 analytes)
054	0229_QC101_230308	Waters WATER	WATER	- EP231X PFAS - Full Suite (28 analytes)
055	0229_QC154_230308	Waters WATER	WATER	- EP231X PFAS - Full Suite (28 analytes)
056	0229_MW121_230308	Waters WATER	WATER	- EP231X PFAS - Full Suite (28 analytes)
057	0229_QC301_230307	Waters WATER	WATER	- EP231X PFAS - Full Suite (28 analytes)
058	0229_MW236S_230308	Waters WATER	WATER	- EP231X PFAS - Full Suite (28 analytes)
059	0229_SW130_230308	Waters WATER	WATER	- EP231X PFAS - Full Suite (28 analytes)
060	0229_QC303_230308	Waters WATER	WATER	- EP231X PFAS - Full Suite (28 analytes)
061	0229_MW1231_230308	Waters WATER	WATER	- EP231X PFAS - Full Suite (28 analytes)
062	0229_SD130_230308	Sediments SEDIMENT	SOIL	- EP231X (solids) PFAS - Full Suite (28 analytes)
063	0229_SD126_230308	Sediments SEDIMENT	SOIL	- EP231X (solids) PFAS - Full Suite (28 analytes)

RELINQUISHED BY:

RECEIVED BY:

RELINQUISHED BY:

RECEIVED BY:

DATE TIME:

DATE TIME:

DATE TIME:

DATE TIME: 15/3/23
4:30

CLIENT: AECOMAU - AECOM AUSTRALIA PTY LTD

PROJECT: QLD_0229_PFASOMP_23

SITE: QLD_0229

ORDER NO: 60612487 task 3.1

PROJECT MANAGER:

PRIMARY SAMPLER:

EMAIL REPORTS TO:

EMAIL INVOICES TO:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

CONTACT PH:

QUOTE NO: TV/007/21 v2 - Compass

SAMPLER MOBILE:

/ ET2021AECOMAU000
1

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:

064	0229_SD227_230309	Sediments SEDIMENT	SOIL	- EP231X (solids) PFAS - Full Suite (28 analytes)
065	0229_SD134_230308	Sediments SEDIMENT	SOIL	- EP231X (solids) PFAS - Full Suite (28 analytes)
066	0229_SD244_230308	Sediments SEDIMENT	SOIL	- EP231X (solids) PFAS - Full Suite (28 analytes)
067	0229_SD232_230309	Sediments SEDIMENT	SOIL	- EP231X (solids) PFAS - Full Suite (28 analytes)
068	0229_SD220_230309	Sediments SEDIMENT	SOIL	- EP231X (solids) PFAS - Full Suite (28 analytes)
069	0229_SD242_230309	Sediments SEDIMENT	SOIL	- EP231X (solids) PFAS - Full Suite (28 analytes)
070	0229_SD205_230309	Sediments SEDIMENT	SOIL	- EP231X (solids) PFAS - Full Suite (28 analytes)
071	0229_SW232_230309	Waters WATER	WATER	- EP231X PFAS - Full Suite (28 analytes)
072	0229_MW232_230309	Waters WATER	WATER	- EP231X PFAS - Full Suite (28 analytes)
073	0229_MW138_230309	Waters WATER	WATER	- EP231X PFAS - Full Suite (28 analytes)
074	0229_MW118_230309	Waters WATER	WATER	- EP231X PFAS - Full Suite (28 analytes)
075	0229_MW105_230309	Waters WATER	WATER	- EP231X PFAS - Full Suite (28 analytes)
076	0229_SW205_230309	Waters WATER	WATER	- EP231X PFAS - Full Suite (28 analytes)
077	0229_QC103_230309	Waters WATER	WATER	- EP231X PFAS - Full Suite (28 analytes)
078	0229_QC102_230309	Waters WATER	WATER	- EP231X PFAS - Full Suite (28 analytes)
079	0229_SW242_230309	Waters WATER	WATER	- EP231X PFAS - Full Suite (28 analytes)

RELINQUISHED BY:

RECEIVED BY:

RELINQUISHED BY:

RECEIVED BY:

DATE TIME:

DATE TIME:

DATE TIME:

DATE TIME: 15/3/23
8:52e

CLIENT: AECOMAU - AECOM AUSTRALIA PTY LTD

PROJECT: QLD_0229_PFASOMP_23

SITE: QLD_0229

ORDER NO: 60612487 task 3.1

PROJECT MANAGER:

PRIMARY SAMPLER:

EMAIL REPORTS TO:

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:

CONTACT PH:

SAMPLER MOBILE:

QUOTE NO: TV/007/21 v2 - Compass

/ ET2021AECOMAU000

1

080	0229_QC553_230309	Waters WATER	WATER	- EP231X PFAS - Full Suite (28 analytes)
081	0229_MW101_230309	Waters WATER	WATER	- EP231X PFAS - Full Suite (28 analytes)
082	0229_MW114_230309	Waters WATER	WATER	- EP231X PFAS - Full Suite (28 analytes)
083	0229_MW128_230309	Waters WATER	WATER	- EP231X PFAS - Full Suite (28 analytes)
084	0229_QC104_230309	Waters WATER	WATER	- EP231X PFAS - Full Suite (28 analytes)
085	0229_MW102_230309	Waters WATER	WATER	- EP231X PFAS - Full Suite (28 analytes)
086	0229_QC104_230309	Waters WATER	WATER	- EP231X PFAS - Full Suite (28 analytes)
087	0229_SW220_230309	Waters WATER	WATER	- EP231X PFAS - Full Suite (28 analytes)
088	0229_SW243_230309	Waters WATER	WATER	- EP231X PFAS - Full Suite (28 analytes)
089	0229_SD243_230309	Sediments SEDIMENT	SOIL	- EP231X (solids) PFAS - Full Suite (28 analytes)
090	0229_MW131_230309	Waters WATER	WATER	- EP231X PFAS - Full Suite (28 analytes)
091	0229_MW018_230309	Waters WATER	WATER	- EP231X PFAS - Full Suite (28 analytes)
092	0229_MW072_230309	Waters WATER	WATER	- EP231X PFAS - Full Suite (28 analytes)
093	0229_MW106_230309	Waters WATER	WATER	- EP231X PFAS - Full Suite (28 analytes)
094	0229_MW141_230309	Waters WATER	WATER	- EP231X PFAS - Full Suite (28 analytes)
095	0229_MW139_230309	Waters WATER	WATER	- EP231X PFAS - Full Suite (28 analytes)



CHAIN OF CUSTODY

COC#: 49308 ALS Laboratory: ET Townsville

RELINQUISHED BY:

RECEIVED BY:

RELINQUISHED BY:

RECEIVED

DATE TIME:

DATE TIME:

DATE TIME:

DATE TIME:

15/3/23
8:30

CLIENT: AECOMAU - AECOM AUSTRALIA PTY LTD

PROJECT: QLD_0229_PFASOMP_23

SITE: QLD_0229

ORDER NO: 60612487 task 3.1

PROJECT MANAGER:

PRIMARY SAMPLER:

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:

CONTACT PH:

SAMPLER MOBILE:

QUOTE NO: TV/007/21 v2 - Compass

/ ET2021AECOMAU000

1

EMAIL REPORTS TO:

EMAIL INVOICES TO:

096	0229_MW074_230309	Waters WATER	WATER	- EP231X PFAS - Full Suite (28 analytes)
097	0229_MW135_230309	Waters WATER	WATER	- EP231X PFAS - Full Suite (28 analytes)
098	0229_SW113_230310	Waters WATER	WATER	- EP231X PFAS - Full Suite (28 analytes)
099	0229_SW119_230310	Waters WATER	WATER	- EP231X PFAS - Full Suite (28 analytes)
100	0229_SW144_230310	Waters WATER	WATER	- EP231X PFAS - Full Suite (28 analytes)
101	0229_MW116_230310	Waters WATER	WATER	- EP231X PFAS - Full Suite (28 analytes)
102	0229_SD144_230310	Sediments SEDIMENT	SOIL	- EP231X (solids) PFAS - Full Suite (28 analytes)
103	0229_SD113_230310	Sediments SEDIMENT	SOIL	- EP231X (solids) PFAS - Full Suite (28 analytes)
104	0229_SD119_230310	Sediments SEDIMENT	SOIL	- EP231X (solids) PFAS - Full Suite (28 analytes)
105	0229_SW245_220308	Waters WATER	WATER	- EP231X PFAS - Full Suite (28 analytes)
106	0229_SD203_230308	Sediments SEDIMENT	SOIL	- EP231X (solids) PFAS - Full Suite (28 analytes)
107	0229_SD245_230308	Sediments SEDIMENT	SOIL	- EP231X (solids) PFAS - Full Suite (28 analytes)
108	0229_QC105_230306	Sediments SEDIMENT	SOIL	- EP231X (solids) PFAS - Full Suite (28 analytes)
109	0229_QC300_230308	Waters WATER	WATER	- EP231X PFAS - Full Suite (28 analytes)

RELINQUISHED BY:

RECEIVED BY:

RELINQUISHED BY:

RECEIVED

DATE TIME:

DATE TIME:

DATE TIME:

DATE TIME: 15/3/23
8:30

CLIENT: AECOMAU - AECOM AUSTRALIA PTY LTD

PROJECT: QLD_0229_PFSOMP_23

SITE: QLD_0229

ORDER NO: 60612487 task 3.1

PROJECT MANAGER:

PRIMARY SAMPLER:

EMAIL REPORTS TO:

EMAIL INVOICES TO:

CONTACT PH:

QUOTE NO: TV/007/21 v2 - Compass

SAMPLER MOBILE:

/ ET2021AECOMAU000
1

TURNAROUND REQUIREMENTS: 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

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

Random Sample Temperature on Receipt: C

Other comments:

SAMPLE	SAMPLE NAME	BOTTLE NAME	VOLUME	BARCODE	TYPE	FILTERED	REASON
001	0229_MW220S_230307	HDPE (no PTFE)	20 mL	00352010065443	Grey	No	
001	0229_MW220S_230307	HDPE (no PTFE)	20 mL	00352101052880	Grey	No	
001	0229_MW220S_230307	HDPE (no PTFE)	20 mL	00350821027489	Grey	No	
001	0229_MW220S_230307	HDPE (no PTFE)	20 mL	00352101052830	Grey	No	
002	0229_MW233_230307	HDPE (no PTFE)	20 mL	00352010065484	Grey	No	
002	0229_MW233_230307	HDPE (no PTFE)	20 mL	00352010065558	Grey	No	
002	0229_MW233_230307	HDPE (no PTFE)	20 mL	00352010065502	Grey	No	
002	0229_MW233_230307	HDPE (no PTFE)	20 mL	00352010065568	Grey	No	
003	0229_MW212_230307	HDPE (no PTFE)	20 mL	00350821031451	Grey	No	
003	0229_MW212_230307	HDPE (no PTFE)	20 mL	00350821031422	Grey	No	
003	0229_MW212_230307	HDPE (no PTFE)	20 mL	00350821031477	Grey	No	
003	0229_MW212_230307	HDPE (no PTFE)	20 mL	00350821031603	Grey	No	
004	0229_SW132_230306	HDPE (no PTFE)	20 mL	00350821031434	Grey	No	
004	0229_SW132_230306	HDPE (no PTFE)	20 mL	00350821031323	Grey	No	
004	0229_SW132_230306	HDPE (no PTFE)	20 mL	00350821031259	Grey	No	
004	0229_SW132_230306	HDPE (no PTFE)	20 mL	00350821031664	Grey	No	
005	0229_SW140_230306	HDPE (no PTFE)	20 mL	00350821031201	Grey	No	
005	0229_SW140_230306	HDPE (no PTFE)	20 mL	00350821031674	Grey	No	
005	0229_SW140_230306	HDPE (no PTFE)	20 mL	00350821011930	Grey	No	
005	0229_SW140_230306	HDPE (no PTFE)	20 mL	00350821031261	Grey	No	
006	0229_SW133_230306	HDPE (no PTFE)	20 mL	00350821011918	Grey	No	
006	0229_SW133_230306	HDPE (no PTFE)	20 mL	00350821031388	Grey	No	
006	0229_SW133_230306	HDPE (no PTFE)	20 mL	00350821031512	Grey	No	
006	0229_SW133_230306	HDPE (no PTFE)	20 mL	00350821031694	Grey	No	
007	0229_SW136_230306	HDPE (no PTFE)	20 mL	00350821031657	Grey	No	
007	0229_SW136_230306	HDPE (no PTFE)	20 mL	00350821031245	Grey	No	

RELINQUISHED BY:
 DATE TIME:

RECEIVED BY:
 DATE TIME:

RELINQUISHED BY:
 DATE TIME:

RECEIVED BY: [REDACTED]
 DATE TIME: 15/3/23
 8:30

CLIENT: AECOMAU - AECOM AUSTRALIA PTY LTD

PROJECT: QLD_0229_PFASOMP_23

SITE: QLD_0229

ORDER NO: 60612487 task 3.1

PROJECT MANAGER: [REDACTED]

PRIMARY SAMPLER: [REDACTED]

EMAIL REPORTS TO: [REDACTED]

EMAIL INVOICES TO: [REDACTED]

TURNAROUND REQUIREMENTS: 5 Days
 Biohazard info:
 CONTACT PH: SAMPLER MOBILE:
 QUOTE NO: TV/007/21 v2 - Compass / ET2021AECOMAU000
 1

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	0229_SW136_230306	HDPE (no PTFE)	20 mL	00350821031464	Grey	No	
007	0229_SW136_230306	HDPE (no PTFE)	20 mL	00350821031236	Grey	No	
008	0229_SW109_230306	HDPE (no PTFE)	20 mL	00350821011957	Grey	No	
008	0229_SW109_230306	HDPE (no PTFE)	20 mL	00350821031358	Grey	No	
008	0229_SW109_230306	HDPE (no PTFE)	20 mL	00350821031566	Grey	No	
008	0229_SW109_230306	HDPE (no PTFE)	20 mL	00350821011917	Grey	No	
009	0229_SW139_230306	HDPE (no PTFE)	20 mL	00350821031558	Grey	No	
009	0229_SW139_230306	HDPE (no PTFE)	20 mL	00350821031307	Grey	No	
009	0229_SW139_230306	HDPE (no PTFE)	20 mL	00350821031652	Grey	No	
009	0229_SW139_230306	HDPE (no PTFE)	20 mL	00350821031258	Grey	No	
010	0229_SW217_230306	HDPE (no PTFE)	20 mL	00350821011999	Grey	No	
010	0229_SW217_230306	HDPE (no PTFE)	20 mL	00350821031458	Grey	No	
010	0229_SW217_230306	HDPE (no PTFE)	20 mL	00350821031648	Grey	No	
010	0229_SW217_230306	HDPE (no PTFE)	20 mL	00350821031547	Grey	No	
011	0229_SW233_230306	HDPE (no PTFE)	20 mL	00350821031484	Grey	No	
011	0229_SW233_230306	HDPE (no PTFE)	20 mL	00350821031669	Grey	No	
011	0229_SW233_230306	HDPE (no PTFE)	20 mL	00350821031454	Grey	No	
011	0229_SW233_230306	HDPE (no PTFE)	20 mL	00350821031308	Grey	No	
012	0229_SW135_230306	HDPE (no PTFE)	20 mL	00350821031634	Grey	No	
012	0229_SW135_230306	HDPE (no PTFE)	20 mL	00350821031539	Grey	No	
012	0229_SW135_230306	HDPE (no PTFE)	20 mL	00350821031226	Grey	No	
012	0229_SW135_230306	HDPE (no PTFE)	20 mL	00350821031354	Grey	No	
013	0229_SW128_230306	HDPE (no PTFE)	20 mL	00350821031683	Grey	No	
013	0229_SW128_230306	HDPE (no PTFE)	20 mL	00350821031613	Grey	No	
013	0229_SW128_230306	HDPE (no PTFE)	20 mL	00350821031392	Grey	No	
013	0229_SW128_230306	HDPE (no PTFE)	20 mL	00350821031319	Grey	No	
014	0229_SW203_230306	HDPE (no PTFE)	20 mL	00350821031442	Grey	No	



CHAIN OF CUSTODY

COC#: 49308 ALS Laboratory: ET Townsville

RELINQUISHED BY:

RECEIVED BY:

RELINQUISHED BY:

RECEIVED BY: [Redacted]

DATE TIME:

DATE TIME:

DATE TIME:

DATE TIME: 15/3/23
4530

CLIENT: AECOMAU - AECOM AUSTRALIA PTY LTD

PROJECT: QLD_0229_PFSOMP_23

SITE: QLD_0229

ORDER NO: 60612487 task 3.1

PROJECT MANAGER: [Redacted]

PRIMARY SAMPLER: [Redacted]

EMAIL REPORTS TO: [Redacted]

EMAIL INVOICES TO: [Redacted]

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

CONTACT PH:

SAMPLER MOBILE:

QUOTE NO: TV/007/21 v2 - Compass

/ ET2021AECOMAU000

1

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:

014	0229_SW203_230306	HDPE (no PTFE)	20 mL	00350821011913	Grey	No	
014	0229_SW203_230306	HDPE (no PTFE)	20 mL	00350821031355	Grey	No	
014	0229_SW203_230306	HDPE (no PTFE)	20 mL	00350821031586	Grey	No	
015	0229_QC150_230306	HDPE (no PTFE)	20 mL	00350821031635	Grey	No	
015	0229_QC150_230306	HDPE (no PTFE)	20 mL	00350821011990	Grey	No	
016	0229_QC350_230306	HDPE (no PTFE)	20 mL	00350821031374	Grey	No	
016	0229_QC350_230306	HDPE (no PTFE)	20 mL	00350821031617	Grey	No	
017	0229_QC100_230306	HDPE (no PTFE)	20 mL	00350821011934	Grey	No	
017	0229_QC100_230306	HDPE (no PTFE)	20 mL	00350821011940	Grey	No	
017	0229_QC100_230306	HDPE (no PTFE)	20 mL	00350821031387	Grey	No	
017	0229_QC100_230306	HDPE (no PTFE)	20 mL	00350821011976	Grey	No	
018	0229_QC152_230306	HDPE (no PTFE)	20 mL	00350821031457	Grey	No	
018	0229_QC152_230306	HDPE (no PTFE)	20 mL	00350821031528	Grey	No	
019	0229_SW129_230306	HDPE (no PTFE)	20 mL	00350821031513	Grey	No	
019	0229_SW129_230306	HDPE (no PTFE)	20 mL	00350821011924	Grey	No	
019	0229_SW129_230306	HDPE (no PTFE)	20 mL	00350821011920	Grey	No	
019	0229_SW129_230306	HDPE (no PTFE)	20 mL	00350821031286	Grey	No	
020	0229_SD121_230306	HDPE Soil Jar	200 mL	00621019120245	Grey	No	
021	0229_SD136_230306	HDPE Soil Jar	200 mL	00621019120244	Grey	No	
022	0229_SD110_230306	HDPE Soil Jar	200 mL	00621122056942	Grey	No	
023	0229_SD120_230306	HDPE Soil Jar	200 mL	00621019120152	Grey	No	
024	0229_SD133_230306	HDPE Soil Jar	200 mL	00621122056914	Grey	No	
025	0229_SD140_230306	HDPE Soil Jar	200 mL	00621122056897	Grey	No	
026	0229_SD139_230306	HDPE Soil Jar	200 mL	00621122056934	Grey	No	
027	0229_QC151_230306	HDPE Soil Jar	200 mL	00620719044213	Grey	No	
028	0229_SD135_230306	HDPE Soil Jar	200 mL	00621019120177	Grey	No	
029	0229_SD109_230306	HDPE Soil Jar	200 mL	00621122056930	Grey	No	

RELINQUISHED BY:

RECEIVED BY:

RELINQUISHED BY:

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DATE TIME:

DATE TIME:

DATE TIME:

DATE TIME: 13/3/23
8:30

CLIENT: AECOMAU - AECOM AUSTRALIA PTY LTD

PROJECT: QLD_0229_PFASOMP_23

SITE: QLD_0229

ORDER NO: 60612487 task 3.1

PROJECT MANAGER:

PRIMARY SAMPLER:

CONTACT PH:

QUOTE NO: TV/007/21 v2 - Compass

SAMPLER MOBILE:

/ ET2021AECOMAU000
1

EMAIL REPORTS TO:

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:

030	0229_SD217_230306	HDPE Soil Jar	200 mL	00621019120156	Grey	No	
031	0229_SD129_230306	HDPE Soil Jar	200 mL	00620719044240	Grey	No	
032	0229_QC153_230306	HDPE Soil Jar	200 mL	00620719044147	Grey	No	
033	0229_SD132_230306	HDPE Soil Jar	200 mL	00621019120184	Grey	No	
034	0229_SD128_230306	HDPE Soil Jar	200 mL	00621122057015	Grey	No	
035	0229_MW119_230307	HDPE (no PTFE)	20 mL	00352010065648	Grey	No	
035	0229_MW119_230307	HDPE (no PTFE)	20 mL	00352010065635	Grey	No	
035	0229_MW119_230307	HDPE (no PTFE)	20 mL	00350621030169	Grey	No	
035	0229_MW119_230307	HDPE (no PTFE)	20 mL	00350621030153	Grey	No	
036	0229_MW125I_230308	HDPE (no PTFE)	20 mL	00350821031645	Grey	No	
036	0229_MW125I_230308	HDPE (no PTFE)	20 mL	00350821031549	Grey	No	
036	0229_MW125I_230308	HDPE (no PTFE)	20 mL	00350821031415	Grey	No	
036	0229_MW125I_230308	HDPE (no PTFE)	20 mL	00350821011932	Grey	No	
037	0229_MW115_230308	HDPE (no PTFE)	20 mL	00350821031460	Grey	No	
037	0229_MW115_230308	HDPE (no PTFE)	20 mL	00350821031483	Grey	No	
038	0229_MW205S_230308	HDPE (no PTFE)	20 mL	00350522022052	Grey	No	
038	0229_MW205S_230308	HDPE (no PTFE)	20 mL	00350522022105	Grey	No	
038	0229_MW205S_230308	HDPE (no PTFE)	20 mL	00350522052978	Grey	No	
038	0229_MW205S_230308	HDPE (no PTFE)	20 mL	00350522052854	Grey	No	
039	0229_MW125S_230308	HDPE (no PTFE)	20 mL	00350821031428	Grey	No	
039	0229_MW125S_230308	HDPE (no PTFE)	20 mL	00350821031327	Grey	No	
039	0229_MW125S_230308	HDPE (no PTFE)	20 mL	00350821031330	Grey	No	
039	0229_MW125S_230308	HDPE (no PTFE)	20 mL	00350821031322	Grey	No	
040	0229_MW002_230308	HDPE (no PTFE)	20 mL	00350821031493	Grey	No	
040	0229_MW002_230308	HDPE (no PTFE)	20 mL	00350821031257	Grey	No	
041	0229_MW235S_230308	HDPE (no PTFE)	20 mL	00350522022157	Grey	No	
041	0229_MW235S_230308	HDPE (no PTFE)	20 mL	00350522053061	Grey	No	

RELINQUISHED BY:
 DATE TIME:

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 DATE TIME:

RELINQUISHED BY:
 DATE TIME:

RECEIVED BY: [Redacted]
 DATE TIME: 15/3/23
 x=30

CLIENT: AECOMAU - AECOM AUSTRALIA PTY LTD

PROJECT: QLD_0229_PFASOMP_23

SITE: QLD_0229

ORDER NO: 60612487 task 3.1

PROJECT MANAGER: [Redacted]
 PRIMARY SAMPLER: [Redacted]

CONTACT PH: [Redacted] SAMPLER MOBILE: [Redacted]
 QUOTE NO: TV/007/21 v2 - Compass / ET2021AECOMAU000
 1

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:

041	0229_MW235S_230308	HDPE (no PTFE)	20 mL	00350522022073	Grey	No	
041	0229_MW235S_230308	HDPE (no PTFE)	20 mL	00350522052833	Grey	No	
042	0229_MW217_230308	HDPE (no PTFE)	20 mL	00350522052867	Grey	No	
042	0229_MW217_230308	HDPE (no PTFE)	20 mL	00350522052985	Grey	No	
042	0229_MW217_230308	HDPE (no PTFE)	20 mL	00350522052884	Grey	No	
042	0229_MW217_230308	HDPE (no PTFE)	20 mL	00350522052861	Grey	No	
043	0229_SW126_230308	HDPE (no PTFE)	20 mL	00350821031368	Grey	No	
043	0229_SW126_230308	HDPE (no PTFE)	20 mL	00350821031431	Grey	No	
043	0229_SW126_230308	HDPE (no PTFE)	20 mL	00350821031334	Grey	No	
043	0229_SW126_230308	HDPE (no PTFE)	20 mL	00350821031472	Grey	No	
044	0229_MW003_230308	HDPE (no PTFE)	20 mL	00350821031437	Grey	No	
044	0229_MW003_230308	HDPE (no PTFE)	20 mL	00350821031386	Grey	No	
044	0229_MW003_230308	HDPE (no PTFE)	20 mL	00352010065457	Grey	No	
044	0229_MW003_230308	HDPE (no PTFE)	20 mL	00352010065464	Grey	No	
045	0229_MW065_230308	HDPE (no PTFE)	20 mL	00350821031671	Grey	No	
045	0229_MW065_230308	HDPE (no PTFE)	20 mL	00350821031435	Grey	No	
045	0229_MW065_230308	HDPE (no PTFE)	20 mL	00350821031511	Grey	No	
045	0229_MW065_230308	HDPE (no PTFE)	20 mL	00350821031588	Grey	No	
046	0229_MW122_230308	HDPE (no PTFE)	20 mL	00350821031631	Grey	No	
046	0229_MW122_230308	HDPE (no PTFE)	20 mL	00350821031579	Grey	No	
046	0229_MW122_230308	HDPE (no PTFE)	20 mL	00350821031681	Grey	No	
046	0229_MW122_230308	HDPE (no PTFE)	20 mL	00350821031490	Grey	No	
047	0229_SW134_230308	HDPE (no PTFE)	20 mL	00350821031622	Grey	No	
047	0229_SW134_230308	HDPE (no PTFE)	20 mL	00350821031455	Grey	No	
047	0229_SW134_230308	HDPE (no PTFE)	20 mL	00350821031500	Grey	No	
047	0229_SW134_230308	HDPE (no PTFE)	20 mL	00350821031441	Grey	No	
048	0229_SW227_230308	HDPE (no PTFE)	20 mL	00350821031227	Grey	No	

RELINQUISHED BY:
 DATE TIME:

RECEIVED BY:
 DATE TIME:

RELINQUISHED BY:
 DATE TIME:

RECEIVED BY: [Redacted]
 DATE TIME: 15/3/23 @ 8:30

CLIENT: AECOMAU - AECOM AUSTRALIA PTY LTD
 PROJECT: QLD_0229_PFASOMP_23
 SITE: QLD_0229
 ORDER NO: 60612487 task 3.1

PROJECT MANAGER: [Redacted]
 PRIMARY SAMPLER: [Redacted]

CONTACT PH: [Redacted] SAMPLER MOBILE: [Redacted]
 QUOTE NO: TV/007/21 v2 - Compass / ET2021AECOMAU0001

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:

048	0229_SW		20 mL	00350821031430	Grey	No	
048	0229_SW227_230308	HDPE (no PTFE)	20 mL	00350821031504	Grey	No	
048	0229_SW227_230308	HDPE (no PTFE)	20 mL	00350821031321	Grey	No	
049	0229_MW123S_230308	HDPE (no PTFE)	20 mL	00350821031410	Grey	No	
049	0229_MW123S_230308	HDPE (no PTFE)	20 mL	00350821031303	Grey	No	
049	0229_MW123S_230308	HDPE (no PTFE)	20 mL	00350821031264	Grey	No	
049	0229_MW123S_230308	HDPE (no PTFE)	20 mL	00350821031296	Grey	No	
050	0229_MW120_230308	HDPE (no PTFE)	20 mL	00350821027499	Grey	No	
050	0229_MW120_230308	HDPE (no PTFE)	20 mL	00350821027637	Grey	No	
051	0229_SW244_230308	HDPE (no PTFE)	20 mL	00350821031570	Grey	No	
051	0229_SW244_230308	HDPE (no PTFE)	20 mL	00350821031324	Grey	No	
051	0229_SW244_230308	HDPE (no PTFE)	20 mL	00350821031650	Grey	No	
051	0229_SW244_230308	HDPE (no PTFE)	20 mL	00350821031701	Grey	No	
052	0229_MW124_230308	HDPE (no PTFE)	20 mL	00350821031587	Grey	No	
052	0229_MW124_230308	HDPE (no PTFE)	20 mL	00350821031338	Grey	No	
052	0229_MW124_230308	HDPE (no PTFE)	20 mL	00350821031611	Grey	No	
052	0229_MW124_230308	HDPE (no PTFE)	20 mL	00350821031561	Grey	No	
053	0229_QC302_230308	HDPE (no PTFE)	20 mL	00350522033597	Grey	No	
053	0229_QC302_230308	HDPE (no PTFE)	20 mL	00350522052995	Grey	No	
054	0229_QC101_230308	HDPE (no PTFE)	20 mL	00350522022050	Grey	No	
054	0229_QC101_230308	HDPE (no PTFE)	20 mL	00350522022029	Grey	No	
055	0229_QC154_230308	HDPE (no PTFE)	20 mL	00350821031290	Grey	No	
055	0229_QC154_230308	HDPE (no PTFE)	20 mL	00350821031335	Grey	No	
055	0229_QC154_230308	HDPE (no PTFE)	20 mL	00350821031309	Grey	No	
055	0229_QC154_230308	HDPE (no PTFE)	20 mL	00350821031366	Grey	No	
056	0229_MW121_230308	HDPE (no PTFE)	20 mL	00350821031373	Grey	No	
056	0229_MW121_230308	HDPE (no PTFE)	20 mL	00350821031524	Grey	No	

RELINQUISHED BY:
 DATE TIME:

RECEIVED BY:
 DATE TIME:

RELINQUISHED BY:
 DATE TIME:

RECEIVED BY: [Redacted]
 DATE TIME: 15/3/23
 @ 8:30

CLIENT: AECOMAU - AECOM AUSTRALIA PTY LTD

PROJECT: QLD_0229_PFASOMP_23

SITE: QLD_0229

ORDER NO: 60612487 task 3.1

PROJECT MANAGER: [Redacted]
 PRIMARY SAMPLER: [Redacted]

CONTACT PH: [Redacted] SAMPLER MOBILE: [Redacted]
 QUOTE NO: TV/007/21 v2 - Compass / ET2021AECOMAU000
 1

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:

057	0229_QC301_230307	HDPE (no PTFE)	20 mL	00350821031509	Grey	No	
057	0229_QC301_230307	HDPE (no PTFE)	20 mL	00350821031591	Grey	No	
057	0229_QC301_230307	HDPE (no PTFE)	20 mL	00350821031302	Grey	No	
057	0229_QC301_230307	HDPE (no PTFE)	20 mL	00350821031265	Grey	No	
058	0229_MW236S_230308	HDPE (no PTFE)	20 mL	00350522022031	Grey	No	
058	0229_MW236S_230308	HDPE (no PTFE)	20 mL	00350522022195	Grey	No	
058	0229_MW236S_230308	HDPE (no PTFE)	20 mL	00350522022187	Grey	No	
058	0229_MW236S_230308	HDPE (no PTFE)	20 mL	00350522022198	Grey	No	
059	0229_SW130_230308	HDPE (no PTFE)	20 mL	00350821031536	Grey	No	
059	0229_SW130_230308	HDPE (no PTFE)	20 mL	00350821031550	Grey	No	
059	0229_SW130_230308	HDPE (no PTFE)	20 mL	00350821031219	Grey	No	
059	0229_SW130_230308	HDPE (no PTFE)	20 mL	00350821031487	Grey	No	
060	0229_QC303_230308	HDPE (no PTFE)	20 mL	00350522052889	Grey	No	
060	0229_QC303_230308	HDPE (no PTFE)	20 mL	00350522052842	Grey	No	
061	0229_MW123I_230308	HDPE (no PTFE)	20 mL	00350821031351	Grey	No	
061	0229_MW123I_230308	HDPE (no PTFE)	20 mL	00350821031336	Grey	No	
061	0229_MW123I_230308	HDPE (no PTFE)	20 mL	00350821031647	Grey	No	
061	0229_MW123I_230308	HDPE (no PTFE)	20 mL	00350821031297	Grey	No	
062	0229_SD130_230308	HDPE Soil Jar	200 mL	00620322045773	Grey	No	
063	0229_SD126_230308	HDPE Soil Jar	200 mL	00620322045847	Grey	No	
064	0229_SD227_230308	HDPE Soil Jar	200 mL	00620719044229	Grey	No	
065	0229_SD134_230308	HDPE Soil Jar	200 mL	00621122057021	Grey	No	
066	0229_SD244_230308	HDPE Soil Jar	200 mL	00620719044226	Grey	No	
067	0229_SD232_230309	HDPE Soil Jar	200 mL	00621019120139	Grey	No	
068	0229_SD220_230309	HDPE Soil Jar	200 mL	00620719044165	Grey	No	
069	0229_SD242_230309	HDPE Soil Jar	200 mL	00620719044164	Grey	No	
070	0229_SD205_230309	HDPE Soil Jar	200 mL	00620719044282	Grey	No	

RELINQUISHED BY:

RECEIVED BY:

RELINQUISHED BY:

RECEIVED BY: [REDACTED]

DATE TIME:

DATE TIME:

DATE TIME:

DATE TIME: 15/3/23
 @ 8:30

CLIENT: AECOMAU - AECOM AUSTRALIA PTY LTD

PROJECT: QLD_0229_PFSOMP_23

SITE: QLD_0229

ORDER NO: 60612487 task 3.1

PROJECT MANAGER: [REDACTED]

PRIMARY SAMPLER: [REDACTED]

EMAIL REPORTS TO: [REDACTED]

EMAIL INVOICES TO: [REDACTED]

CONTACT PH: [REDACTED]

QUOTE NO: TV/007/21 v2 - Compass

SAMPLER MOBILE:

/ ET2021AECOMAU000
 1

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

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

Random Sample Temperature on Receipt: °C

Other comments:

071	0229_SW232_230309	HDPE (no PTFE)	20 mL	00350522022009	Grey	No	
071	0229_SW232_230309	HDPE (no PTFE)	20 mL	00350522021949	Grey	No	
071	0229_SW232_230309	HDPE (no PTFE)	20 mL	00350522022093	Grey	No	
071	0229_SW232_230309	HDPE (no PTFE)	20 mL	00350522022207	Grey	No	
072	0229_MW232_230309	HDPE (no PTFE)	20 mL	00350522052987	Grey	No	
072	0229_MW232_230309	HDPE (no PTFE)	20 mL	00350522052891	Grey	No	
072	0229_MW232_230309	HDPE (no PTFE)	20 mL	00350522053001	Grey	No	
072	0229_MW232_230309	HDPE (no PTFE)	20 mL	00350522052983	Grey	No	
073	0229_MW138_230309	HDPE (no PTFE)	20 mL	00350522052935	Grey	No	
073	0229_MW138_230309	HDPE (no PTFE)	20 mL	00350522052996	Grey	No	
073	0229_MW138_230309	HDPE (no PTFE)	20 mL	00350522052835	Grey	No	
073	0229_MW138_230309	HDPE (no PTFE)	20 mL	00350522052859	Grey	No	
074	0229_MW118_230309	HDPE (no PTFE)	20 mL	00350821011970	Grey	No	
074	0229_MW118_230309	HDPE (no PTFE)	20 mL	00350821011973	Grey	No	
074	0229_MW118_230309	HDPE (no PTFE)	20 mL	00350821031535	Grey	No	
074	0229_MW118_230309	HDPE (no PTFE)	20 mL	00350821031318	Grey	No	
075	0229_MW105_230309	HDPE (no PTFE)	20 mL	00350821031585	Grey	No	
075	0229_MW105_230309	HDPE (no PTFE)	20 mL	00350821031541	Grey	No	
075	0229_MW105_230309	HDPE (no PTFE)	20 mL	00350821031583	Grey	No	
075	0229_MW105_230309	HDPE (no PTFE)	20 mL	00350821031449	Grey	No	
076	0229_SW205_230309	HDPE (no PTFE)	20 mL	00350522052979	Grey	No	
076	0229_SW205_230309	HDPE (no PTFE)	20 mL	00350522053074	Grey	No	
076	0229_SW205_230309	HDPE (no PTFE)	20 mL	00350522053051	Grey	No	
076	0229_SW205_230309	HDPE (no PTFE)	20 mL	00350522052807	Grey	No	
077	0229_QC103_230309	HDPE (no PTFE)	20 mL	00350821031234	Grey	No	
077	0229_QC103_230309	HDPE (no PTFE)	20 mL	00350821031711	Grey	No	
077	0229_QC103_230309	HDPE (no PTFE)	20 mL	00350821031526	Grey	No	

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	DATE TIME: 15/3/23 8:30

CLIENT: AECOMAU - AECOM AUSTRALIA PTY LTD
 PROJECT: QLD_0229_PFSOMP_23
 SITE: QLD_0229
 ORDER NO: 60612487 task 3.1

TURNAROUND REQUIREMENTS : 5 Days
 Biohazard info:

LABORATORY USE ONLY (Circle)
 Custody Seal intact? Yes No N/A
 Free ice / frozen ice bricks present upon receipt? Yes No N/A

PROJECT MANAGER: [REDACTED]
 PRIMARY SAMPLER: [REDACTED]

CONTACT PH: [REDACTED] SAMPLER MOBILE: [REDACTED]
 QUOTE NO: TV/007/21 v2 - Compass / ET2021AECOMAU0001

Random Sample Temperature on Receipt: °C
 Other comments:

EMAIL REPORTS TO: [REDACTED]
 EMAIL INVOICES TO: [REDACTED]

077	0229_QC103_230309	HDPE (no PTFE)	20 mL	00350821031569	Grey	No	
078	0229_QC102_230309	HDPE (no PTFE)	20 mL	00350522053035	Grey	No	
078	0229_QC102_230309	HDPE (no PTFE)	20 mL	00350522052847	Grey	No	
078	0229_QC102_230309	HDPE (no PTFE)	20 mL	00350522021966	Grey	No	
078	0229_QC102_230309	HDPE (no PTFE)	20 mL	00350522022034	Grey	No	
079	0229_SW242_230309	HDPE (no PTFE)	20 mL	00350522053046	Grey	No	
079	0229_SW242_230309	HDPE (no PTFE)	20 mL	00350522022224	Grey	No	
079	0229_SW242_230309	HDPE (no PTFE)	20 mL	00350522022219	Grey	No	
079	0229_SW242_230309	HDPE (no PTFE)	20 mL	00350522053068	Grey	No	
080	0229_QC353_230308	HDPE (no PTFE)	20 mL	00352010065642	Grey	No	
080	0229_QC353_230308	HDPE (no PTFE)	20 mL	00352010065634	Grey	No	
081	0229_MW101_230309	HDPE (no PTFE)	20 mL	00350821031203	Grey	No	
081	0229_MW101_230309	HDPE (no PTFE)	20 mL	00350821031515	Grey	No	
081	0229_MW101_230309	HDPE (no PTFE)	20 mL	00350821031510	Grey	No	
081	0229_MW101_230309	HDPE (no PTFE)	20 mL	00350821011938	Grey	No	
082	0229_MW114_230309	HDPE (no PTFE)	20 mL	00350522052948	Grey	No	
082	0229_MW114_230309	HDPE (no PTFE)	20 mL	00350522052949	Grey	No	
082	0229_MW114_230309	HDPE (no PTFE)	20 mL	00350522052878	Grey	No	
082	0229_MW114_230309	HDPE (no PTFE)	20 mL	00350522052876	Grey	No	
083	0229_MW128_230309	HDPE (no PTFE)	20 mL	00350522052879	Grey	No	
083	0229_MW128_230309	HDPE (no PTFE)	20 mL	00350522022083	Grey	No	
083	0229_MW128_230309	HDPE (no PTFE)	20 mL	00350522052956	Grey	No	
083	0229_MW128_230309	HDPE (no PTFE)	20 mL	00350522022202	Grey	No	
084	0229_QC104_230309	HDPE (no PTFE)	20 mL	00350821031224	Grey	No	
084	0229_QC104_230309	HDPE (no PTFE)	20 mL	00350522021968	Grey	No	
084	0229_QC104_230309	HDPE (no PTFE)	20 mL	00350522022091	Grey	No	
084	0229_QC104_230309	HDPE (no PTFE)	20 mL	00350821031637	Grey	No	



CHAIN OF CUSTODY

COC#: 49308 ALS Laboratory: ET Townsville

RELINQUISHED BY:

RECEIVED BY:

RELINQUISHED BY:

RECEIVED

DATE TIME:

DATE TIME:

DATE TIME:

DATE TIME: 15/3/23

CLIENT: AECOMAU - AECOM AUSTRALIA PTY LTD

PROJECT: QLD_0229_PFASOMP_23

SITE: QLD_0229

ORDER NO: 60612487 task 3.1

PROJECT MANAGER:

PRIMARY SAMPLER:

CONTACT PH:

QUOTE NO: TV/007/21 v2 - Compass

SAMPLER MOBILE:

ET2021AECOMAU000
1

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

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

Random Sample Temperature on Receipt: °C

Other comments:

EMAIL REPORTS TO:

EMAIL INVOICES TO:

085	0229_MW102_230309	HDPE (no PTFE)	20 mL	00350821011928	Grey	No	
085	0229_MW102_230309	HDPE (no PTFE)	20 mL	00350821011966	Grey	No	
085	0229_MW102_230309	HDPE (no PTFE)	20 mL	00350821031284	Grey	No	
085	0229_MW102_230309	HDPE (no PTFE)	20 mL	00350821011965	Grey	No	
086	0229_QC104_230309	HDPE (no PTFE)	20 mL	00350522053009	Grey	No	
086	0229_QC104_230309	HDPE (no PTFE)	20 mL	00350522052991	Grey	No	
087	0229_SW220_230309	HDPE (no PTFE)	20 mL	00350522053007	Grey	No	
087	0229_SW220_230309	HDPE (no PTFE)	20 mL	00350522052866	Grey	No	
087	0229_SW220_230309	HDPE (no PTFE)	20 mL	00350522053069	Grey	No	
087	0229_SW220_230309	HDPE (no PTFE)	20 mL	00350522052887	Grey	No	
088	0229_SW243_230309	HDPE (no PTFE)	20 mL	00350522022205	Grey	No	
088	0229_SW243_230309	HDPE (no PTFE)	20 mL	00350522022178	Grey	No	
088	0229_SW243_230309	HDPE (no PTFE)	20 mL	00350522021944	Grey	No	
088	0229_SW243_230309	HDPE (no PTFE)	20 mL	00350522022075	Grey	No	
089	0229_SD243_230309	HDPE Soil Jar	200 mL	00620719044202	Grey	No	
090	0229_MW131_230309	HDPE (no PTFE)	20 mL	00350821031239	Grey	No	
090	0229_MW131_230309	HDPE (no PTFE)	20 mL	00350821031456	Grey	No	
090	0229_MW131_230309	HDPE (no PTFE)	20 mL	00350821031656	Grey	No	
090	0229_MW131_230309	HDPE (no PTFE)	20 mL	00350821031589	Grey	No	
091	0229_MW018_230309	HDPE (no PTFE)	20 mL	00350821031396	Grey	No	
091	0229_MW018_230309	HDPE (no PTFE)	20 mL	00350821031403	Grey	No	
091	0229_MW018_230309	HDPE (no PTFE)	20 mL	00350821031249	Grey	No	
091	0229_MW018_230309	HDPE (no PTFE)	20 mL	00350821031597	Grey	No	
092	0229_MW072_230309	HDPE (no PTFE)	20 mL	00350821031310	Grey	No	
092	0229_MW072_230309	HDPE (no PTFE)	20 mL	00350821031642	Grey	No	
092	0229_MW072_230309	HDPE (no PTFE)	20 mL	00350821031552	Grey	No	
092	0229_MW072_230309	HDPE (no PTFE)	20 mL	00350821011942	Grey	No	

RELINQUISHED BY:

RECEIVED BY:

RELINQUISHED BY:

RECEIVED BY: [REDACTED]

DATE TIME:

DATE TIME:

DATE TIME:

DATE TIME: 15/3/23
@ 8:30

CLIENT: AECOMAU - AECOM AUSTRALIA PTY LTD

PROJECT: QLD_0229_PFASOMP_23

SITE: QLD_0229

ORDER NO: 60612487 task 3.1

PROJECT MANAGER: [REDACTED]

PRIMARY SAMPLER: [REDACTED]

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:

CONTACT PH: [REDACTED]

SAMPLER MOBILE:

QUOTE NO: TV/007/21 v2 - Compass / ET2021AECOMAU000
1

093	0229_MW106_230309	HDPE (no PTFE)	20 mL	00350821031594	Grey	No	
093	0229_MW106_230309	HDPE (no PTFE)	20 mL	00350821031498	Grey	No	
093	0229_MW106_230309	HDPE (no PTFE)	20 mL	00350821011943	Grey	No	
093	0229_MW106_230309	HDPE (no PTFE)	20 mL	00350821011982	Grey	No	
094	0229_MW141_230309	HDPE (no PTFE)	20 mL	00350821011941	Grey	No	
094	0229_MW141_230309	HDPE (no PTFE)	20 mL	00350821031242	Grey	No	
094	0229_MW141_230309	HDPE (no PTFE)	20 mL	00350821031207	Grey	No	
094	0229_MW141_230309	HDPE (no PTFE)	20 mL	00350821031294	Grey	No	
095	0229_MW139_230309	HDPE (no PTFE)	20 mL	00350522053015	Grey	No	
095	0229_MW139_230309	HDPE (no PTFE)	20 mL	00350522052999	Grey	No	
095	0229_MW139_230309	HDPE (no PTFE)	20 mL	00350522053004	Grey	No	
095	0229_MW139_230309	HDPE (no PTFE)	20 mL	00350522052908	Grey	No	
096	0229_MW074_230309	HDPE (no PTFE)	20 mL	00350821031562	Grey	No	
096	0229_MW074_230309	HDPE (no PTFE)	20 mL	00350821031278	Grey	No	
096	0229_MW074_230309	HDPE (no PTFE)	20 mL	00350821031606	Grey	No	
096	0229_MW074_230309	HDPE (no PTFE)	20 mL	00350821031424	Grey	No	
097	0229_MW135_230309	HDPE (no PTFE)	20 mL	00350821031615	Grey	No	
097	0229_MW135_230309	HDPE (no PTFE)	20 mL	00350821031676	Grey	No	
097	0229_MW135_230309	HDPE (no PTFE)	20 mL	00350821011995	Grey	No	
097	0229_MW135_230309	HDPE (no PTFE)	20 mL	00350821031212	Grey	No	
098	0229_SW113_230310	HDPE (no PTFE)	20 mL	00350522052853	Grey	No	
098	0229_SW113_230310	HDPE (no PTFE)	20 mL	00350522052816	Grey	No	
099	0229_SW119_230310	HDPE (no PTFE)	20 mL	00352010057399	Grey	No	
099	0229_SW119_230310	HDPE (no PTFE)	20 mL	00352010065692	Grey	No	
099	0229_SW119_230310	HDPE (no PTFE)	20 mL	00352010065599	Grey	No	
100	0229_SW144_230310	HDPE (no PTFE)	20 mL	00350821031691	Grey	No	
100	0229_SW144_230310	HDPE (no PTFE)	20 mL	00350821031600	Grey	No	

RELINQUISHED BY:
 DATE TIME:

RECEIVED BY:
 DATE TIME:

RELINQUISHED BY:
 DATE TIME:

RECEIVED BY:
 DATE TIME: 13/3/23
 8:30

CLIENT: AECOMAU - AECOM AUSTRALIA PTY LTD
 PROJECT: QLD_0229_PFASOMP_23
 SITE: QLD_0229
 ORDER NO: 60612487 task 3.1

TURNAROUND REQUIREMENTS : 5 Days
 Biohazard info:

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

PROJECT MANAGER:
 PRIMARY SAMPLER:

CONTACT PH:
 QUOTE NO: TV/007/21 v2 - Compass

SAMPLER MOBILE:
 / ET2021AECOMAU000
 1

EMAIL REPORTS TO:

EMAIL INVOICES TO:

101	0229_MW116_230310	HDPE (no PTFE)	20 mL	00350821031339	Grey	No	
101	0229_MW116_230310	HDPE (no PTFE)	20 mL	00350821031229	Grey	No	
102	0229_SD144_230310	HDPE Soil Jar	200 mL	00620322093521	Grey	No	
103	0229_SD113_230310	HDPE Soil Jar	200 mL	00620322045798	Grey	No	
104	0229_SD119_230310	HDPE Soil Jar	200 mL	00620322093427	Grey	No	
105	0229_SW245_220308	HDPE (no PTFE)	20 mL	00350821031444	Grey	No	
105	0229_SW245_220308	HDPE (no PTFE)	20 mL	00350821031389	Grey	No	
105	0229_SW245_220308	HDPE (no PTFE)	20 mL	00350821031320	Grey	No	
105	0229_SW245_220308	HDPE (no PTFE)	20 mL	00350821031287	Grey	No	
106	0229_SD203_230308	HDPE Soil Jar	200 mL	00621019120127	Grey	No	
107	0229_SD245_230308	HDPE Soil Jar	200 mL	00620719044290	Grey	No	
108	0229_QC105_230306	HDPE Soil Jar	200 mL	00621019120149	Grey	No	
109	0229_QC300_230308	HDPE (no PTFE)	20 mL	00350821011935	Grey	No	
109	0229_QC300_230308	HDPE (no PTFE)	20 mL	00350821031429	Grey	No	
109	0229_QC300_230308	HDPE (no PTFE)	20 mL	00350821031220	Grey	No	
109	0229_QC300_230308	HDPE (no PTFE)	20 mL	00350821031427	Grey	No	

Total Bottle Count: ALS: 312, Non ALS: 0

CHAIN OF CUSTODY DOCUMENTATION

CLIENT: **AECOM Australia**
 ADDRESS / OFFICE: **AECOM Townsville, Level 7-12, Townsville St, South Townsville**
 PROJECT MANAGER (PM): **[Redacted]**
 PROJECT ID: **QLD-0229-1FA50V1P-23**
 SITE: **QLD-0229** P.O. NO: **60612487-3-1**
 RESULTS REQUIRED (Date): **Standard TAT** ✓ **5 days** QUOTE NO:

SAMPLER: **[Redacted]**
 MOBILE: **[Redacted]**
 PHONE: **[Redacted]**
 EMAIL REPORT TO: **[Redacted]**
 EMAIL INVOICE TO: **[Redacted]**
 ANALYSIS REQUIRE: **[Redacted]**

Destination Laboratory:
EUROFINS

FOR LABORATORY USE ONLY
 COOLER SEAL (circle appropriate)
 Intact: Yes No N/A
 SAMPLE TEMPERATURE
 CHILLED: Yes No

COMMENTS / SPECIAL HANDLING / STORAGE OR DISPOSAL

ALS ID	SAMPLE ID	MATRIX	DATE	Time	Type / Code	Total bottles	PAHS 28 Standard LEX	HOLD
	0229-QC200-230306	W	6/3/23	1500	4 x 20mL	4	X	
	0229-QC201-230308	W	8/3/23	-		4	X	
	0229-QC202-230309	W	9/3/23	-		4	X	
	0229-QC206-230315	W	15/3/23	0840		4	X	
	0229-QC205-230316	S	6/3/23	1500	1 x JAC	1	X	
	0229-QC207-230315	S	15/3/23	0930		1	X	
	0229-QC251-230306	S	6/3/23	1123		1	X	
	0229-QC253-230306	S	6/6/23	1550		1	X	
	0229-QC203-230309	W	9/3/23	1150	4 x 20mL	4	X	
	0229-QC250-230306	W	6/3/23	1123	2 x 20mL	2	X	
	0229-QC252-230306	W	6/3/23	1330	2 x 20mL	2	X	
	0229-QC254-230308	W	8/3/23	-	4 x 20mL	4	X	

RELINQUISHED BY:
 Name: **[Redacted]**
 Of: **AECOM**
 Name: **[Redacted]**
 Of: **[Redacted]**

RECEIVED BY:
 Name: **[Redacted]**
 Of: **[Redacted]**
 Name: **[Redacted]**
 Of: **[Redacted]**

METHOD OF SHIPMENT
 Date: **17/3/23**
 Time: **2:35 pm**
 Cont' Note No:
 Transport Co:

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

Appendix E

Laboratory Analytical Reports

CERTIFICATE OF ANALYSIS

Work Order : **ET2301427**
Client : **AECOM AUSTRALIA PTY LTD**
Contact : [REDACTED]
Address : [REDACTED]

Telephone : [REDACTED]
Project : **QLD_0229_PFASOMP_23**
Order number : **60612487 task 3.1**
C-O-C number : **49609**
Sampler : [REDACTED]
Site : **QLD_0229**
Quote number : **TV/007/21 v2 - Compass**
No. of samples received : **4**
No. of samples analysed : **4**

Page : 1 of 7
Laboratory : Environmental Division Townsville
Contact : [REDACTED]
Address : [REDACTED]

Telephone : [REDACTED]
Date Samples Received : 15-Mar-2023 08:30
Date Analysis Commenced : 15-Mar-2023
Issue Date : 22-Mar-2023 16:32



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.

<i>Signatories</i>	<i>Position</i>	<i>Accreditation Category</i>
[REDACTED]	Senior Chemist - Organics	Brisbane Organics, Stafford, QLD
[REDACTED]	Senior Inorganic Chemist	Brisbane Inorganics, Stafford, QLD
[REDACTED]	Senior Chemist - Organics	Brisbane Organics, Stafford, QLD



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.
- All analysis will be conducted by ALS Environmental, Brisbane, NATA accreditation no. 825, Site No. 818.
- 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.
- 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: SOIL (Matrix: SOIL)		Sample ID		0229_SD211_230309	0229_SD212_230309	----	----	----
		Sampling date / time		09-Mar-2023 16:20	09-Mar-2023 16:20	----	----	----
Compound	CAS Number	LOR	Unit	ET2301427-001	ET2301427-002	-----	-----	-----
				Result	Result	----	----	----
EA055: Moisture Content (Dried @ 105-110°C)								
Moisture Content	----	0.1	%	22.1	27.6	----	----	----
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	0.0010	<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	----	----	----
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	<0.0005	----	----	----



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	0229_SD211_230309	0229_SD212_230309	----	----	----
Sampling date / time				09-Mar-2023 16:20	09-Mar-2023 16:20	----	----	----	
Compound	CAS Number	LOR	Unit	ET2301427-001	ET2301427-002	-----	-----	-----	
				Result	Result	----	----	----	
EP231C: Perfluoroalkyl Sulfonamides - Continued									
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	0.0010	<0.0002	----	----	----	
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg	0.0010	<0.0002	----	----	----	
Sum of PFAS (WA DER List)	----	0.0002	mg/kg	0.0010	<0.0002	----	----	----	
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.0002	%	120	110	----	----	----	
13C8-PFOA	----	0.0002	%	110	102	----	----	----	



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	0229_SW211_230309	0229_SW212_230309	----	----	----
Sampling date / time				09-Mar-2023 16:20	09-Mar-2023 16:40	----	----	----	
Compound	CAS Number	LOR	Unit	ET2301427-003	ET2301427-004	-----	-----	-----	
				Result	Result	----	----	----	
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	0.02	0.06	----	----	----	
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	0.05	0.18	----	----	----	
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	0.04	0.10	----	----	----	
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	0.06	----	----	----	
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	0.01	----	----	----	
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	----	----	----	



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	0229_SW211_230309	0229_SW212_230309	----	----	----
Sampling date / time				09-Mar-2023 16:20	09-Mar-2023 16:40	----	----	----	
Compound	CAS Number	LOR	Unit	ET2301427-003	ET2301427-004	-----	-----	-----	
				Result	Result	----	----	----	
EP231C: Perfluoroalkyl Sulfonamides - Continued									
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	0.11	0.48	----	----	----	
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	0.09	0.28	----	----	----	
Sum of PFAS (WA DER List)	----	0.01	µg/L	0.11	0.46	----	----	----	
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%	99.6	105	----	----	----	
13C8-PFOA	----	0.02	%	98.6	102	----	----	----	



Surrogate Control Limits

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

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

Inter-Laboratory Testing

Analysis conducted by ALS Brisbane, NATA accreditation no. 825, site no. 818 (Chemistry) 18958 (Biology).

- (SOIL) EP231B: Perfluoroalkyl Carboxylic Acids
- (SOIL) EP231D: (n:2) Fluorotelomer Sulfonic Acids
- (SOIL) EP231C: Perfluoroalkyl Sulfonamides
- (SOIL) EP231A: Perfluoroalkyl Sulfonic Acids
- (SOIL) EP231P: PFAS Sums
- (SOIL) EP231S: PFAS Surrogate
- (SOIL) EA055: Moisture Content (Dried @ 105-110°C)
- (WATER) EP231A: Perfluoroalkyl Sulfonic Acids
- (WATER) EP231B: Perfluoroalkyl Carboxylic Acids
- (WATER) EP231C: Perfluoroalkyl Sulfonamides
- (WATER) EP231D: (n:2) Fluorotelomer Sulfonic Acids
- (WATER) EP231P: PFAS Sums
- (WATER) EP231S: PFAS Surrogate

QUALITY CONTROL REPORT

Work Order	: ET2301427	Page	: 1 of 11
Client	: AECOM AUSTRALIA PTY LTD	Laboratory	: Environmental Division Townsville
Contact	: [REDACTED]	Contact	: [REDACTED]
Address	: [REDACTED]	Address	: [REDACTED]
Telephone	: ----	Telephone	: [REDACTED]
Project	: QLD_0229_PFASOMP_23	Date Samples Received	: 15-Mar-2023
Order number	: 60612487 task 3.1	Date Analysis Commenced	: 15-Mar-2023
C-O-C number	: 49609	Issue Date	: 22-Mar-2023
Sampler	: [REDACTED]		
Site	: QLD_0229		
Quote number	: TV/007/21 v2 - Compass		
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.

<i>Signatories</i>	<i>Position</i>	<i>Accreditation Category</i>
[REDACTED]	Senior Chemist - Organics	Brisbane Organics, Stafford, QLD
[REDACTED]	Senior Inorganic Chemist	Brisbane Inorganics, Stafford, QLD
[REDACTED]	Senior Chemist - Organics	Brisbane Organics, Stafford, QLD



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: 4931498)									
ET2301427-001	0229_SD211_230309	EA055: Moisture Content	----	0.1	%	22.1	25.0	12.5	0% - 20%
ET2301429-028	Anonymous	EA055: Moisture Content	----	0.1	%	29.0	25.2	14.2	0% - 20%
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 4931497)									
ET2301427-001	0229_SD211_230309	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	0.0010	0.0009	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
ET2301429-028	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	0.0012	0.0012	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	0.0014	0.0015	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: 4931497)									
ET2301427-001	0229_SD211_230309	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: 4931497) - continued									
ET2301427-001	0229_SD211_230309	EP231X: Perfluorotridecanoic acid (PFTTrDA)	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
ET2301429-028	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	0.0003	0.0003	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 (PFTTrDA)	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: 4931497)									
ET2301427-001	0229_SD211_230309	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
ET2301429-028	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



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: 4931497)									
ET2301427-001	0229_SD211_230309	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
ET2301429-028	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: 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: 4934751)									
EB2307616-005	Anonymous	EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	0.05	0.05	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	0.08	0.07	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
ET2301427-003	0229_SW211_230309	EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	0.05	0.05	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	0.04	0.04	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: 4934751)									
EB2307616-005	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



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: 4934751) - continued									
EB2307616-005	Anonymous	EP231X: Perfluorotridecanoic acid (PFTTrDA)	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
ET2301427-003	0229_SW211_230309	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 (PFTTrDA)	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: 4934751)									
EB2307616-005	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
ET2301427-003	0229_SW211_230309	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: 4934751)									
EB2307616-005	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
ET2301427-003	0229_SW211_230309	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: 4934751)									
EB2307616-005	Anonymous	EP231X: Sum of PFAS	----	0.01	µg/L	0.15	0.14	6.9	0% - 50%
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	0.13	0.12	8.0	0% - 50%
		EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	0.15	0.14	6.9	0% - 50%
ET2301427-003	0229_SW211_230309	EP231X: Sum of PFAS	----	0.01	µg/L	0.11	0.11	0.0	0% - 50%
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	0.09	0.09	0.0	No Limit
		EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	0.11	0.11	0.0	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: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report				
				Result	Spike Concentration	Spike Recovery (%)		Acceptable Limits (%)	
						LCS	Low	High	
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4931497)									
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	0.0011 mg/kg	104	72.0	128	
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	0.00117 mg/kg	102	73.0	123	
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	0.00118 mg/kg	106	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	100	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: 4931497)									
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	0.00625 mg/kg	94.2	71.0	135	
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	0.00125 mg/kg	88.0	69.0	132	
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	0.00125 mg/kg	92.4	70.0	132	
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	0.00125 mg/kg	89.6	71.0	131	
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	96.8	69.0	133	
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	99.2	72.0	129	
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	0.00125 mg/kg	94.8	69.0	133	
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	94.8	64.0	136	
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	95.6	69.0	135	
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	93.2	66.0	139	
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	0.00312 mg/kg	94.4	69.0	133	
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4931497)									
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	0.00125 mg/kg	88.4	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	111	62.8	140	
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	0.00312 mg/kg	102	61.5	139	
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	0.00312 mg/kg	108	61.9	137	
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	0.00125 mg/kg	98.0	63.0	144	
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	0.00125 mg/kg	93.2	61.0	139	
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4931497)									
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	0.00117 mg/kg	104	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	102	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	97.9	65.0	137	



Sub-Matrix: **SOIL**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report Result	Laboratory Control Spike (LCS) Report			
					Spike Concentration	Spike Recovery (%)	Acceptable Limits (%)	
						LCS	Low	High
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4931497) - continued								
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	0.0012 mg/kg	99.2	54.8	124

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report Result	Laboratory Control Spike (LCS) Report			
					Spike Concentration	Spike Recovery (%)	Acceptable Limits (%)	
						LCS	Low	High
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4934751)								
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	90.3	71.0	127
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	0.2373 µg/L	96.3	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	92.4	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: 4934751)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	1.25 µg/L	114	73.0	129
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	0.25 µg/L	96.8	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	86.2	72.0	130
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	0.25 µg/L	88.6	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	91.4	71.0	129
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	0.25 µg/L	90.6	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	93.0	65.0	144
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	0.625 µg/L	110	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4934751)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.25 µg/L	111	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	0.625 µg/L	128	68.0	141
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	0.625 µg/L	109	60.5	138
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	0.625 µg/L	86.5	68.3	134
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	0.625 µg/L	99.0	62.6	138
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	0.25 µg/L	113	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: 4934751)								
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	114	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 (%)	Acceptable Limits (%)	
						LCS	Low	High
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4934751) - continued								
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	0.24 µg/L	117	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	116	64.2	133
EP231P: PFAS Sums (QCLot: 4934751)								
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: SOIL

Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report			
				Spike Concentration	Spike Recovery(%) MS	Low	High
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4931497)							
ET2301427-002	0229_SD212_230309	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	112	73.0	123
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.00118 mg/kg	117	67.0	130
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.00119 mg/kg	124	70.0	132
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.00116 mg/kg	120	68.0	136
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0012 mg/kg	119	59.0	134
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4931497)							
ET2301427-002	0229_SD212_230309	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.00625 mg/kg	109	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	97.2	70.0	132
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.00125 mg/kg	99.2	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	104	72.0	129
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.00125 mg/kg	102	69.0	133
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.00125 mg/kg	100	64.0	136
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.00125 mg/kg	107	69.0	135
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.00125 mg/kg	104	66.0	139
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.00312 mg/kg	106	69.0	133
		EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4931497)					
ET2301427-002	0229_SD212_230309	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.00125 mg/kg	102	48.0	128
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.00312 mg/kg	106	70.0	130



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: 4931497) - continued							
ET2301427-002	0229_SD212_230309	EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.00312 mg/kg	128	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.00312 mg/kg	100	70.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.00312 mg/kg	116	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.00125 mg/kg	107	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: 4931497)							
ET2301427-002	0229_SD212_230309	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.00117 mg/kg	103	62.0	145
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.00118 mg/kg	118	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0012 mg/kg	80.8	65.0	137
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0012 mg/kg	87.1	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
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4934751)							
EB2307616-009	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.2218 µg/L	106	72.0	130
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.235 µg/L	97.5	71.0	127
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.2352 µg/L	117	68.0	131
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.238 µg/L	117	69.0	134
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.232 µg/L	123	65.0	140
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.241 µg/L	115	53.0	142
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4934751)							
EB2307616-009	Anonymous	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	1.25 µg/L	129	73.0	129
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.25 µg/L	116	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	97.4	72.0	130
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.25 µg/L	97.4	71.0	133
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.25 µg/L	121	69.0	130
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.25 µg/L	106	71.0	129
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.25 µg/L	105	69.0	133
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.25 µg/L	110	72.0	134
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.25 µg/L	102	65.0	144
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.625 µg/L	123	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4934751)							
EB2307616-009	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.25 µg/L	121	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: 4934751) - continued							
EB2307616-009	Anonymous	EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.625 µg/L	129	70.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.625 µg/L	117	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.625 µg/L	94.2	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	119	65.0	136
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.25 µg/L	120	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4934751)							
EB2307616-009	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.234 µg/L	118	63.0	143
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.2378 µg/L	138	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.24 µg/L	118	67.0	138
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.2415 µg/L	116	70.0	130

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: ET2301427	Page	: 1 of 5
Client	: AECOM AUSTRALIA PTY LTD	Laboratory	: Environmental Division Townsville
Contact	: [REDACTED]	Telephone	: [REDACTED]
Project	: QLD_0229_PFASOMP_23	Date Samples Received	: 15-Mar-2023
Site	: QLD_0229	Issue Date	: 22-Mar-2023
Sampler	: [REDACTED]	No. of samples received	: 4
Order number	: 60612487 task 3.1	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) 0229_SD211_230309,	0229_SD212_230309	09-Mar-2023	----	----	----	15-Mar-2023	23-Mar-2023	✓
EP231A: Perfluoroalkyl Sulfonic Acids								
HDPE Soil Jar (EP231X) 0229_SD211_230309,	0229_SD212_230309	09-Mar-2023	18-Mar-2023	05-Sep-2023	✓	21-Mar-2023	27-Apr-2023	✓
EP231B: Perfluoroalkyl Carboxylic Acids								
HDPE Soil Jar (EP231X) 0229_SD211_230309,	0229_SD212_230309	09-Mar-2023	18-Mar-2023	05-Sep-2023	✓	21-Mar-2023	27-Apr-2023	✓
EP231C: Perfluoroalkyl Sulfonamides								
HDPE Soil Jar (EP231X) 0229_SD211_230309,	0229_SD212_230309	09-Mar-2023	18-Mar-2023	05-Sep-2023	✓	21-Mar-2023	27-Apr-2023	✓
EP231D: (n:2) Fluorotelomer Sulfonic Acids								
HDPE Soil Jar (EP231X) 0229_SD211_230309,	0229_SD212_230309	09-Mar-2023	18-Mar-2023	05-Sep-2023	✓	21-Mar-2023	27-Apr-2023	✓
EP231P: PFAS Sums								
HDPE Soil Jar (EP231X) 0229_SD211_230309,	0229_SD212_230309	09-Mar-2023	18-Mar-2023	05-Sep-2023	✓	21-Mar-2023	27-Apr-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) 0229_SW211_230309,	0229_SW212_230309	09-Mar-2023	17-Mar-2023	05-Sep-2023	✓	20-Mar-2023	05-Sep-2023	✓
EP231B: Perfluoroalkyl Carboxylic Acids								
HDPE (no PTFE) (EP231X) 0229_SW211_230309,	0229_SW212_230309	09-Mar-2023	17-Mar-2023	05-Sep-2023	✓	20-Mar-2023	05-Sep-2023	✓
EP231C: Perfluoroalkyl Sulfonamides								
HDPE (no PTFE) (EP231X) 0229_SW211_230309,	0229_SW212_230309	09-Mar-2023	17-Mar-2023	05-Sep-2023	✓	20-Mar-2023	05-Sep-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	
EP231D: (n:2) Fluorotelomer Sulfonic Acids								
HDPE (no PTFE) (EP231X) 0229_SW211_230309,	0229_SW212_230309	09-Mar-2023	17-Mar-2023	05-Sep-2023	✔	20-Mar-2023	05-Sep-2023	✔
EP231P: PFAS Sums								
HDPE (no PTFE) (EP231X) 0229_SW211_230309,	0229_SW212_230309	09-Mar-2023	17-Mar-2023	05-Sep-2023	✔	20-Mar-2023	05-Sep-2023	✔



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	Method	Count		Rate (%)			Quality Control Specification
		QC	Regular	Actual	Expected	Evaluation	
Analytical Methods							
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	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

Matrix: WATER

Evaluation: ✖ = Quality Control frequency not within specification ; ✔ = Quality Control frequency within specification.

Quality Control Sample Type	Method	Count		Rate (%)			Quality Control Specification
		QC	Regular	Actual	Expected	Evaluation	
Analytical Methods							
Laboratory Duplicates (DUP)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	19	10.53	10.00	✔	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	19	5.26	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	19	5.26	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	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
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.
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
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.
Solid Phase Extraction (SPE) for PFAS in water	ORG72	WATER	In-house: Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to the sample container. The entire contents are transferred to a solid phase extraction (SPE) cartridge. The sample container is successively rinsed with aliquots of the elution solvent. The eluted extract is combined with an equal volume of reagent water and a portion is filtered for analysis. Method procedures conform to US DoD QSM 5.3, table B-15 requirements.



SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : ET2301427

Client : [Redacted]
Contact : [Redacted]
Address : [Redacted]

Laboratory : [Redacted]
Contact : [Redacted]
Address : [Redacted]
QLD Australia 4815

E-mail : [Redacted]
Telephone : ---
Facsimile : ---

E-mail : [Redacted]
Telephone : +61 7 3552 8616
Facsimile : ---

Project : QLD_0229_PFASOMP_23
Order number : 60612487 task 3.1

Page : 1 of 3
Quote number : ET2021AECOMAU0001 (TV/007/21 v2 - Compass)
QC Level : NEPM 2013 B3 & ALS QC Standard

C-O-C number : 49609
Site : QLD_0229
Sampler : [Redacted]

Dates

Date Samples Received : 15-Mar-2023 08:30
Client Requested Due Date : 23-Mar-2023

Issue Date : 15-Mar-2023
Scheduled Reporting Date : 23-Mar-2023

Delivery Details

Mode of Delivery : Carrier
No. of coolers/boxes : 2
Receipt Detail : MEDIUM ESKY

Security Seal : Intact.
Temperature : 3.2°C, 3.1°C - Ice present
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
*Samples were originally received by ALS Townsville on 14/03/2023 and have been forwarded to ALS Brisbane for analysis.
Temperature on arrival in ALS Brisbane has been noted above.
Discounted Package Prices apply only when specific ALS Group Codes ('W', 'S', 'NT' suites) are referenced on COCs.
Please direct any turn around / technical queries to the laboratory contact designated above.
Sample Disposal - Aqueous (3 weeks), Solid (2 months ± 1 week) from receipt of samples.
All analysis will be conducted by ALS Environmental, Brisbane, NATA accreditation no. 825, Site No. 818.
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.
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.



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)
ET2301427-001	09-Mar-2023 16:20	0229_SD211_230309	✓	✓
ET2301427-002	09-Mar-2023 16:20	0229_SD212_230309	✓	✓

Matrix: **WATER**

Laboratory sample ID	Sampling date / time	Sample ID	WATER - EP231X PFAS - Full Suite (28 analytes)
ET2301427-003	09-Mar-2023 16:20	0229_SW211_230309	✓
ET2301427-004	09-Mar-2023 16:40	0229_SW212_230309	✓

Proactive Holding Time Report

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



Requested Deliverables

ACCOUNTS PAYABLE

- A4 - AU Tax Invoice (INV)

Email



- *AU Certificate of Analysis - NATA (COA)
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)
- A4 - AU Tax Invoice (INV)
- Chain of Custody (CoC) (COC)
- EDI Format - ENMRG (ENMRG)
- EDI Format - ESDAT (ESDAT)

Email

Email

Email

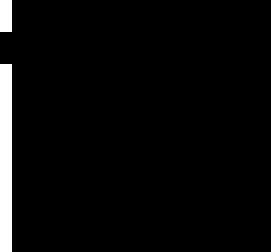
Email

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

Email

Email

Email

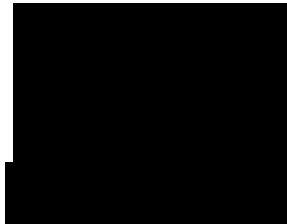
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DERP ESDAT REPORTS

- EDI Format - ESDAT (ESDAT)

Email



- *AU Certificate of Analysis - NATA (COA)
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)
- Chain of Custody (CoC) (COC)
- EDI Format - EQUIS V5 AECOM (EQUIS_V5_AECOM)
- EDI Format - ESDAT (ESDAT)

Email

Email

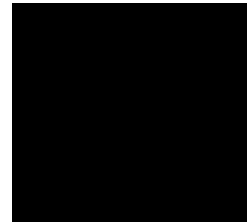
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CERTIFICATE OF ANALYSIS

Work Order : **ET2301428**
Client : [REDACTED]
Contact : [REDACTED]
Address : [REDACTED]

Telephone : [REDACTED]
Project : QLD_0229_PFASOMP_23
Order number : 60612487 task 3.1
C-O-C number : 49610
Sampler : [REDACTED]
Site : QLD_0229
Quote number : TV/007/21 v2 - Compass
No. of samples received : 1
No. of samples analysed : 1

Page : 1 of 5
Laboratory : [REDACTED]
Contact : [REDACTED]
Address : [REDACTED]

Telephone : [REDACTED]
Date Samples Received : 15-Mar-2023 08:30
Date Analysis Commenced : 15-Mar-2023
Issue Date : 22-Mar-2023 16:43



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.

<i>Signatories</i>	<i>Position</i>	<i>Accreditation Category</i>
[REDACTED]	Senior Chemist - Organics	Brisbane Organics, Stafford, QLD



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.
- All analysis will be conducted by ALS Environmental, Brisbane, NATA accreditation no. 825, Site No. 818.
- 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.
- EP231: Stable isotope enriched internal standards are added to samples prior to extraction. Target compounds have a direct analogous internal standard with the exception of PFPeS, PFHpA, PFDS, PFTrDA and 10:2 FTS. These compounds use an internal standard that is chemically related and has a retention time close to that of the target compound. The DQO for internal standard response is 50-150% of that established at initial calibration. PFOS is quantified using a certified, traceable standard consisting of linear and branched PFOS isomers. These practices are in line with recommendations in the National Environmental Management Plan for PFAS (Australian HEPA) and also conform to QSM 5.3 (US DoD) requirements.



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)		Sample ID		0229_MW226_230308	----	----	----	----
Sampling date / time		08-Mar-2023 07:45		----	----	----	----	----
Compound	CAS Number	LOR	Unit	ET2301428-001	-----	-----	-----	-----
				Result	----	----	----	----
EP231A: Perfluoroalkyl Sulfonic Acids								
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	0.08	----	----	----	----
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	0.03	----	----	----	----
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	0.20	----	----	----	----
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	----	----	----	----
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	0.05	----	----	----	----
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	----	----	----	----



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)		Sample ID	0229_MW226_230308	----	----	----	----
		Sampling date / time	08-Mar-2023 07:45	----	----	----	----
Compound	CAS Number	LOR	Unit	ET2301428-001	-----	-----	-----
				Result	----	----	----
EP231C: Perfluoroalkyl Sulfonamides - Continued							
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	0.41	----	----	----
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	0.25	----	----	----
Sum of PFAS (WA DER List)	----	0.01	µg/L	0.38	----	----	----
EP231S: PFAS Surrogate							
13C4-PFOS	----	0.02	%	105	----	----	----
13C8-PFOA	----	0.02	%	104	----	----	----



Surrogate Control Limits

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

Inter-Laboratory Testing

Analysis conducted by ALS Brisbane, NATA accreditation no. 825, site no. 818 (Chemistry) 18958 (Biology).

(WATER) EP231A: Perfluoroalkyl Sulfonic Acids

(WATER) EP231B: Perfluoroalkyl Carboxylic Acids

(WATER) EP231C: Perfluoroalkyl Sulfonamides

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

(WATER) EP231P: PFAS Sums

(WATER) EP231S: PFAS Surrogate

QUALITY CONTROL REPORT

Work Order : ET2301428
Page : 1 of 7
Client : [REDACTED]
Contact : [REDACTED]
Address : [REDACTED]

Laboratory : [REDACTED]
Contact : [REDACTED]
Address : [REDACTED]

Telephone : [REDACTED]

Telephone : [REDACTED]

Project : QLD_0229_PFASOMP_23
Date Samples Received : 15-Mar-2023
Order number : 60612487 task 3.1
Date Analysis Commenced : 15-Mar-2023
C-O-C number : 49610
Issue Date : 22-Mar-2023
Sampler : [REDACTED]

Site : QLD_0229
Quote number : TV/007/21 v2 - Compass
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]	Senior Chemist - Organics	Brisbane Organics, Stafford, QLD



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: 4934751)									
EB2307616-005	Anonymous	EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	0.05	0.05	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	0.08	0.07	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
ET2301427-003	Anonymous	EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	0.05	0.05	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	0.04	0.04	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: 4934751)									
EB2307616-005	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



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: 4934751) - continued									
ET2301427-003	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		
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 4934751)									
EB2307616-005	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
ET2301427-003	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: 4934751)									
EB2307616-005	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: 4934751) - continued									
EB2307616-005	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
ET2301427-003	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
EP231P: PFAS Sums (QC Lot: 4934751)									
EB2307616-005	Anonymous	EP231X: Sum of PFAS	----	0.01	µg/L	0.15	0.14	6.9	0% - 50%
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	0.13	0.12	8.0	0% - 50%
		EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	0.15	0.14	6.9	0% - 50%
ET2301427-003	Anonymous	EP231X: Sum of PFAS	----	0.01	µg/L	0.11	0.11	0.0	0% - 50%
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	0.09	0.09	0.0	No Limit
		EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	0.11	0.11	0.0	0% - 50%



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

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

Sub-Matrix: WATER

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
				Result	Spike Concentration	Spike Recovery (%)	Acceptable Limits (%)	
						LCS	Low	High
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4934751)								
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	90.3	71.0	127
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	0.2373 µg/L	96.3	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	92.4	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: 4934751)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	1.25 µg/L	114	73.0	129
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	0.25 µg/L	96.8	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	86.2	72.0	130
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	0.25 µg/L	88.6	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	91.4	71.0	129
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	0.25 µg/L	90.6	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	93.0	65.0	144
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	0.625 µg/L	110	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4934751)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.25 µg/L	111	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	0.625 µg/L	128	68.0	141
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	0.625 µg/L	109	60.5	138
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	0.625 µg/L	86.5	68.3	134
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	0.625 µg/L	99.0	62.6	138
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	0.25 µg/L	113	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: 4934751)								
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	114	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	117	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 (%)	Acceptable Limits (%)	
						LCS	Low	High
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4934751) - continued								
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	0.241 µg/L	116	64.2	133
EP231P: PFAS Sums (QCLot: 4934751)								
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	Spike Recovery(%)	Acceptable Limits (%)	
					MS	Low	High
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4934751)							
EB2307616-009	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.2218 µg/L	106	72.0	130
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.235 µg/L	97.5	71.0	127
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.2352 µg/L	117	68.0	131
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.238 µg/L	117	69.0	134
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.232 µg/L	123	65.0	140
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.241 µg/L	115	53.0	142
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4934751)							
EB2307616-009	Anonymous	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	1.25 µg/L	129	73.0	129
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.25 µg/L	116	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	97.4	72.0	130
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.25 µg/L	97.4	71.0	133
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.25 µg/L	121	69.0	130
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.25 µg/L	106	71.0	129
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.25 µg/L	105	69.0	133
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.25 µg/L	110	72.0	134
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.25 µg/L	102	65.0	144
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.625 µg/L	123	71.0	132
		EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4934751)					
EB2307616-009	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.25 µg/L	121	59.0	135
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.625 µg/L	129	70.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.625 µg/L	117	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: 4934751) - continued							
EB2307616-009	Anonymous	EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.625 µg/L	94.2	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	119	65.0	136
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.25 µg/L	120	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4934751)							
EB2307616-009	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.234 µg/L	118	63.0	143
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.2378 µg/L	138	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.24 µg/L	118	67.0	138
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.2415 µg/L	116	70.0	130

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: ET2301428	Page	: 1 of 4
Client	: [REDACTED]	Laboratory	: [REDACTED]
Contact	: [REDACTED]	Telephone	: [REDACTED]
Project	: QLD_0229_PFASOMP_23	Date Samples Received	: 15-Mar-2023
Site	: QLD_0229	Issue Date	: 22-Mar-2023
Sampler	: [REDACTED]	No. of samples received	: 1
Order number	: 60612487 task 3.1	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: **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) 0229_MW226_230308	08-Mar-2023	17-Mar-2023	04-Sep-2023	✔	20-Mar-2023	04-Sep-2023	✔
EP231B: Perfluoroalkyl Carboxylic Acids							
HDPE (no PTFE) (EP231X) 0229_MW226_230308	08-Mar-2023	17-Mar-2023	04-Sep-2023	✔	20-Mar-2023	04-Sep-2023	✔
EP231C: Perfluoroalkyl Sulfonamides							
HDPE (no PTFE) (EP231X) 0229_MW226_230308	08-Mar-2023	17-Mar-2023	04-Sep-2023	✔	20-Mar-2023	04-Sep-2023	✔
EP231D: (n:2) Fluorotelomer Sulfonic Acids							
HDPE (no PTFE) (EP231X) 0229_MW226_230308	08-Mar-2023	17-Mar-2023	04-Sep-2023	✔	20-Mar-2023	04-Sep-2023	✔
EP231P: PFAS Sums							
HDPE (no PTFE) (EP231X) 0229_MW226_230308	08-Mar-2023	17-Mar-2023	04-Sep-2023	✔	20-Mar-2023	04-Sep-2023	✔



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	Method	Count		Rate (%)			Quality Control Specification
		QC	Regular	Actual	Expected	Evaluation	
Analytical Methods							
Laboratory Duplicates (DUP)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	19	10.53	10.00	✔	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	19	5.26	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	19	5.26	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	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.

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



SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : ET2301428

Client : [Redacted]
Contact : [Redacted]
Address : [Redacted]

Laboratory : [Redacted]
Contact : [Redacted]
Address : [Redacted]
QLD Australia 4815

E-mail : [Redacted]
Telephone : ---
Facsimile : ---

E-mail : [Redacted]
Telephone : [Redacted]
Facsimile : [Redacted]

Project : QLD_0229_PFASOMP_23
Order number : 60612487 task 3.1

Page : 1 of 2
Quote number : ET2021AECOMAU0001 (TV/007/21 v2 - Compass)

C-O-C number : 49610
Site : QLD_0229
Sampler : [Redacted]

QC Level : NEPM 2013 B3 & ALS QC Standard

Dates

Date Samples Received : 15-Mar-2023 08:30
Client Requested Due Date : 23-Mar-2023

Issue Date : 15-Mar-2023
Scheduled Reporting Date : 23-Mar-2023

Delivery Details

Mode of Delivery : Carrier
No. of coolers/boxes : 1
Receipt Detail : MEDIUM ESKY

Security Seal : Intact.
Temperature : 3.1°C - Ice present
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
*Samples were originally received by ALS Townsville on 14/03/2023 and have been forwarded to ALS Brisbane for analysis.
Temperature on arrival in ALS Brisbane has been noted above.
Discounted Package Prices apply only when specific ALS Group Codes ('W', 'S', 'NT' suites) are referenced on COCs.
Please direct any turn around / technical queries to the laboratory contact designated above.
Sample Disposal - Aqueous (3 weeks), Solid (2 months ± 1 week) from receipt of samples.
All analysis will be conducted by ALS Environmental, Brisbane, NATA accreditation no. 825, Site No. 818.
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.
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.



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)
ET2301428-001	08-Mar-2023 07:45	0229_MW226_230308	✓

Proactive Holding Time Report

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

Requested Deliverables

ACCOUNTS PAYABLE

- A4 - AU Tax Invoice (INV)

Email



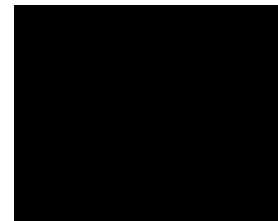
- *AU Certificate of Analysis - NATA (COA)
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)
- A4 - AU Tax Invoice (INV)
- Chain of Custody (CoC) (COC)
- EDI Format - ENMRG (ENMRG)
- EDI Format - ESDAT (ESDAT)

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

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DERP ESDAT REPORTS

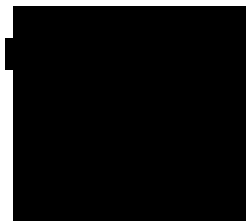
- EDI Format - ESDAT (ESDAT)

Email



- *AU Certificate of Analysis - NATA (COA)
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)
- Chain of Custody (CoC) (COC)
- EDI Format - EQUIS V5 AECOM (EQUIS_V5_AECOM)
- EDI Format - ESDAT (ESDAT)

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CERTIFICATE OF ANALYSIS

Work Order : **ET2301429**
Client : [REDACTED]
Contact : [REDACTED]
Address : [REDACTED]

Telephone : ----
Project : QLD_0229_PFASOMP_23
Order number : 60612487 task 3.1
C-O-C number : 49308
Sampler : [REDACTED]
Site : QLD_0229
Quote number : TV/007/21 v2 - Compass
No. of samples received : 109
No. of samples analysed : 107

Page : 1 of 49
Laboratory : [REDACTED]
Contact : [REDACTED]
Address : [REDACTED]

Telephone : [REDACTED]
Date Samples Received : 14-Mar-2023 09:15
Date Analysis Commenced : 15-Mar-2023
Issue Date : 28-Mar-2023 18:28



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.

<i>Signatories</i>	<i>Position</i>	<i>Accreditation Category</i>
[REDACTED]	Senior Chemist - Organics	Brisbane Organics, Stafford, QLD
[REDACTED]	Senior Inorganic Chemist	Brisbane Inorganics, Stafford, QLD
[REDACTED]	Senior Chemist - Organics	Brisbane Organics, Stafford, QLD



General Comments

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

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

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

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

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

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

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

- EP231X - Per- and Polyfluoroalkyl Substances (PFAS): Samples received in 20ml or 125ml bottles have been tested in accordance with the QSM5.3 compliant, NATA accredited method. 60mL or 250mL bottles have been tested to the legacy QSM 5.1 aligned, NATA accredited method.
- EP231X PFAS: Sample '0229_SD109_230306' required dilution due to the presence of high level contaminants. Surrogate recovery not determined and LOR values have been adjusted accordingly.
- EP231X PFAS: Sample "0229_SD140_230306" required dilution prior to analysis due to matrix interferences. LOR values have been adjusted accordingly.
- All analysis will be conducted by ALS Environmental, Brisbane, NATA accreditation no. 825, Site No. 818.
- EP231X-ST PFAS Super Trace: Whole bottle extraction was not possible for samples 0229_MW235S_230308 (ET2301429-041) & 0229_MW123S_230308 (ET2301429-049). Samples required dilution due matrix interference (High Sediment). LOR values have been adjusted accordingly.
- EP231X PFAS: Whole bottle extraction was not possible for particular samples. Samples required dilution prior to extraction due to the presence of high level contaminants. LOR values have been adjusted accordingly.
- 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.
- 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

				0229_MW125I_23030 8	0229_MW115_230308	0229_MW205S_23030 8	0229_MW125S_23030 8	0229_MW002_230308
Sampling date / time				08-Mar-2023 23:00	08-Mar-2023 14:55	08-Mar-2023 15:10	08-Mar-2023 10:45	08-Mar-2023 14:34
Compound	CAS Number	LOR	Unit	ET2301429-036 Result	ET2301429-037 Result	ET2301429-038 Result	ET2301429-039 Result	ET2301429-040 Result
EP231A: Perfluoroalkyl Sulfonic Acids								
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	0.03	0.15	<0.02	0.10	0.17
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	0.02	0.08	<0.02	0.05	0.13
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	0.13	0.34	0.03	0.58	1.93
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	0.09
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	0.02	0.16	0.03	0.02	3.16
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	0.04
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	0.03	0.12	<0.02	0.11	0.20
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	0.06
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	0.07
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	0.02
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05
EP231C: Perfluoroalkyl Sulfonamides								
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05



Analytical Results

Sub-Matrix: GROUNDWATER
 (Matrix: WATER)

Sample ID

				0229_MW125I_23030 8	0229_MW115_230308	0229_MW205S_23030 8	0229_MW125S_23030 8	0229_MW002_230308
Sampling date / time				08-Mar-2023 23:00	08-Mar-2023 14:55	08-Mar-2023 15:10	08-Mar-2023 10:45	08-Mar-2023 14:34
Compound	CAS Number	LOR	Unit	ET2301429-036	ET2301429-037	ET2301429-038	ET2301429-039	ET2301429-040
				Result	Result	Result	Result	Result
EP231C: Perfluoroalkyl Sulfonamides - Continued								
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02
EP231D: (n:2) Fluorotelomer Sulfonic Acids								
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05
EP231P: PFAS Sums								
Sum of PFAS	----	0.01	µg/L	0.23	0.85	0.06	0.89	5.89
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	0.15	0.50	0.06	0.60	5.09
Sum of PFAS (WA DER List)	----	0.01	µg/L	0.21	0.77	0.06	0.84	5.58
EP231S: PFAS Surrogate								
13C4-PFOS	----	0.02	%	98.5	104	97.9	103	106
13C8-PFOA	----	0.02	%	95.0	103	99.4	99.1	93.4



Analytical Results

Sub-Matrix: GROUNDWATER
 (Matrix: WATER)

Sample ID

				0229_MW235S_230308 8	0229_MW217_230308	0229_MW003_230308	0229_MW065_230308	0229_MW122_230308
Sampling date / time				08-Mar-2023 16:00	08-Mar-2023 14:30	08-Mar-2023 12:00	08-Mar-2023 15:00	08-Mar-2023 12:50
Compound	CAS Number	LOR	Unit	ET2301429-041 Result	ET2301429-042 Result	ET2301429-044 Result	ET2301429-045 Result	ET2301429-046 Result
EP231A: Perfluoroalkyl Sulfonic Acids								
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.10	0.03	<0.02	0.52	0.16
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.10	<0.02	<0.02	0.59	0.12
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.10	0.01	<0.01	8.87	0.94
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.10	<0.02	<0.02	0.51	0.07
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.10	0.02	<0.01	12.9	2.37
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.10	<0.02	<0.02	<0.02	<0.02
EP231B: Perfluoroalkyl Carboxylic Acids								
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.5	<0.1	<0.1	0.2	<0.1
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.10	<0.02	<0.02	0.35	0.02
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.10	<0.02	<0.02	2.13	0.11
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.10	<0.02	<0.02	0.14	<0.02
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.10	<0.01	<0.01	0.30	0.07
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.10	<0.02	<0.02	<0.02	<0.02
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.10	<0.02	<0.02	<0.02	<0.02
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.10	<0.02	<0.02	<0.02	<0.02
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.10	<0.02	<0.02	<0.02	<0.02
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.10	<0.02	<0.02	<0.02	<0.02
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.24	<0.05	<0.05	<0.05	<0.05
EP231C: Perfluoroalkyl Sulfonamides								
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.10	<0.02	<0.02	<0.02	<0.02
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.24	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.24	<0.05	<0.05	<0.05	<0.05



Analytical Results

Sub-Matrix: GROUNDWATER
 (Matrix: WATER)

Sample ID

				0229_MW235S_230308 8	0229_MW217_230308	0229_MW003_230308	0229_MW065_230308	0229_MW122_230308
Sampling date / time				08-Mar-2023 16:00	08-Mar-2023 14:30	08-Mar-2023 12:00	08-Mar-2023 15:00	08-Mar-2023 12:50
Compound	CAS Number	LOR	Unit	ET2301429-041	ET2301429-042	ET2301429-044	ET2301429-045	ET2301429-046
				Result	Result	Result	Result	Result
EP231C: Perfluoroalkyl Sulfonamides - Continued								
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.24	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.24	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.10	<0.02	<0.02	<0.02	<0.02
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.10	<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	<0.10	<0.05	<0.05	<0.05	<0.05
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.10	<0.05	<0.05	<0.05	<0.05
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.10	<0.05	<0.05	<0.05	<0.05
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.10	<0.05	<0.05	<0.05	<0.05
EP231P: PFAS Sums								
Sum of PFAS	----	0.01	µg/L	<0.10	0.06	<0.01	26.5	3.86
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	<0.10	0.03	<0.01	21.8	3.31
Sum of PFAS (WA DER List)	----	0.01	µg/L	<0.10	0.06	<0.01	25.4	3.67
EP231S: PFAS Surrogate								
13C4-PFOS	----	0.02	%	103	101	104	105	101
13C8-PFOA	----	0.02	%	102	98.2	101	98.7	99.1



Analytical Results

Sub-Matrix: GROUNDWATER
 (Matrix: WATER)

Sample ID

				0229_MW123S_230308 8	0229_MW120_230308	0229_MW124_230308	0229_QC302_230308	0229_QC101_230308
Sampling date / time				08-Mar-2023 12:30	08-Mar-2023 14:11	08-Mar-2023 11:45	08-Mar-2023 17:00	08-Mar-2023 16:00
Compound	CAS Number	LOR	Unit	ET2301429-049	ET2301429-050	ET2301429-052	ET2301429-053	ET2301429-054
				Result	Result	Result	Result	Result
EP231A: Perfluoroalkyl Sulfonic Acids								
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	0.83	0.03	<0.02	<0.02	0.03
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	0.60	<0.02	<0.02	<0.02	<0.02
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	6.66	0.03	<0.01	<0.01	<0.01
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	0.83	<0.02	<0.02	<0.02	<0.02
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	6.25	0.08	<0.01	<0.01	<0.01
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.09	<0.02	<0.02	<0.02	<0.02
EP231B: Perfluoroalkyl Carboxylic Acids								
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.5	<0.1	<0.1	<0.1	<0.1
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	0.14	<0.02	<0.02	<0.02	<0.02
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	0.80	<0.02	<0.02	<0.02	<0.02
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.09	<0.02	<0.02	<0.02	<0.02
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	0.37	<0.01	<0.01	<0.01	<0.01
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.09	<0.02	<0.02	<0.02	<0.02
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.09	<0.02	<0.02	<0.02	<0.02
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.09	<0.02	<0.02	<0.02	<0.02
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.09	<0.02	<0.02	<0.02	<0.02
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.09	<0.02	<0.02	<0.02	<0.02
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.23	<0.05	<0.05	<0.05	<0.05
EP231C: Perfluoroalkyl Sulfonamides								
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.09	<0.02	<0.02	<0.02	<0.02
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.23	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.23	<0.05	<0.05	<0.05	<0.05



Analytical Results

Sub-Matrix: GROUNDWATER
 (Matrix: WATER)

Sample ID

				0229_MW123S_230308 8	0229_MW120_230308	0229_MW124_230308	0229_QC302_230308	0229_QC101_230308
Sampling date / time				08-Mar-2023 12:30	08-Mar-2023 14:11	08-Mar-2023 11:45	08-Mar-2023 17:00	08-Mar-2023 16:00
Compound	CAS Number	LOR	Unit	ET2301429-049	ET2301429-050	ET2301429-052	ET2301429-053	ET2301429-054
				Result	Result	Result	Result	Result
EP231C: Perfluoroalkyl Sulfonamides - Continued								
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.23	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.23	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.09	<0.02	<0.02	<0.02	<0.02
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.09	<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	<0.09	<0.05	<0.05	<0.05	<0.05
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.09	<0.05	<0.05	<0.05	<0.05
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.09	<0.05	<0.05	<0.05	<0.05
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.09	<0.05	<0.05	<0.05	<0.05
EP231P: PFAS Sums								
Sum of PFAS	----	0.01	µg/L	16.5	0.14	<0.01	<0.01	0.03
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	12.9	0.11	<0.01	<0.01	<0.01
Sum of PFAS (WA DER List)	----	0.01	µg/L	15.0	0.14	<0.01	<0.01	0.03
EP231S: PFAS Surrogate								
13C4-PFOS	----	0.02	%	99.8	106	105	96.8	102
13C8-PFOA	----	0.02	%	99.5	101	99.3	99.0	105



Analytical Results

Sub-Matrix: GROUNDWATER
 (Matrix: WATER)

Sample ID

				0229_QC154_230308	0229_MW121_230308	0229_MW236S_23030 8	0229_QC303_230308	0229_MW123I_23030 8
Sampling date / time				08-Mar-2023 14:00	08-Mar-2023 13:40	08-Mar-2023 15:50	08-Mar-2023 17:00	08-Mar-2023 12:15
Compound	CAS Number	LOR	Unit	ET2301429-055	ET2301429-056	ET2301429-058	ET2301429-060	ET2301429-061
				Result	Result	Result	Result	Result
EP231A: Perfluoroalkyl Sulfonic Acids								
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	0.16	0.09	0.08	<0.02	4.21
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	0.11	0.06	<0.02	<0.02	4.04
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	0.76	0.42	0.11	<0.01	14.4
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	0.06	<0.02	<0.02	<0.02	0.06
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	1.98	0.08	0.17	<0.01	0.04
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	0.3
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	0.38
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	0.10	<0.02	<0.02	<0.02	2.38
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	0.17
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	0.05	<0.01	<0.01	<0.01	0.06
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05
EP231C: Perfluoroalkyl Sulfonamides								
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05



Analytical Results

Sub-Matrix: GROUNDWATER
 (Matrix: WATER)

Sample ID

				0229_QC154_230308	0229_MW121_230308	0229_MW236S_230308 8	0229_QC303_230308	0229_MW123I_230308 8
Sampling date / time				08-Mar-2023 14:00	08-Mar-2023 13:40	08-Mar-2023 15:50	08-Mar-2023 17:00	08-Mar-2023 12:15
Compound	CAS Number	LOR	Unit	ET2301429-055	ET2301429-056	ET2301429-058	ET2301429-060	ET2301429-061
				Result	Result	Result	Result	Result
EP231C: Perfluoroalkyl Sulfonamides - Continued								
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02
EP231D: (n:2) Fluorotelomer Sulfonic Acids								
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	0.07
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	3.22	0.65	0.36	<0.01	26.1
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	2.74	0.50	0.28	<0.01	14.4
Sum of PFAS (WA DER List)	----	0.01	µg/L	3.05	0.59	0.36	<0.01	22.0
EP231S: PFAS Surrogate								
13C4-PFOS	----	0.02	%	103	102	99.4	101	94.8
13C8-PFOA	----	0.02	%	103	104	102	99.9	97.5



Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0229_MW232_230309	0229_MW138_230309	0229_MW118_230309	0229_MW105_230309	0229_QC103_230309
				Sampling date / time	09-Mar-2023 10:05	09-Mar-2023 09:30	09-Mar-2023 11:50	09-Mar-2023 10:56	09-Mar-2023 11:50
Compound	CAS Number	LOR	Unit	ET2301429-072	ET2301429-073	ET2301429-074	ET2301429-075	ET2301429-077	
				Result	Result	Result	Result	Result	
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	0.17	1.30	0.08	5.70	0.08	
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	1.18	<0.02	5.66	<0.02	
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	0.12	6.75	0.03	39.7	0.03	
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.64	<0.02	2.14	<0.02	
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	0.13	8.75	0.01	28.0	0.01	
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	<0.02	<0.02	<0.05	<0.02	
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	0.2	<0.1	0.7	<0.1	
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	0.33	<0.02	1.91	<0.02	
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	1.62	<0.02	11.2	<0.02	
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	0.22	<0.02	1.17	<0.02	
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	0.43	<0.01	1.80	<0.01	
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	0.05	<0.02	0.17	<0.02	
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	<0.02	<0.02	<0.05	<0.02	
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	<0.02	<0.02	<0.05	<0.02	
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	<0.02	<0.02	<0.05	<0.02	
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	<0.02	<0.02	<0.05	<0.02	
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	<0.05	<0.05	<0.12	<0.05	
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	<0.02	<0.02	<0.05	<0.02	
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	<0.05	<0.05	<0.12	<0.05	
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	<0.05	<0.05	<0.12	<0.05	



Analytical Results

Sub-Matrix: GROUNDWATER
 (Matrix: WATER)

Sample ID

				0229_MW232_230309	0229_MW138_230309	0229_MW118_230309	0229_MW105_230309	0229_QC103_230309
Sampling date / time				09-Mar-2023 10:05	09-Mar-2023 09:30	09-Mar-2023 11:50	09-Mar-2023 10:56	09-Mar-2023 11:50
Compound	CAS Number	LOR	Unit	ET2301429-072	ET2301429-073	ET2301429-074	ET2301429-075	ET2301429-077
				Result	Result	Result	Result	Result
EP231C: Perfluoroalkyl Sulfonamides - Continued								
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	<0.05	<0.05	<0.12	<0.05
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	<0.05	<0.05	<0.12	<0.05
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	<0.02	<0.02	<0.05	<0.02
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	<0.02	<0.02	<0.05	<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	0.18	<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	0.42	21.5	0.12	98.3	0.12
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	0.25	15.5	0.04	67.7	0.04
Sum of PFAS (WA DER List)	----	0.01	µg/L	0.42	19.6	0.12	90.4	0.12
EP231S: PFAS Surrogate								
13C4-PFOS	----	0.02	%	97.3	96.4	99.5	96.7	98.0
13C8-PFOA	----	0.02	%	101	101	97.8	94.4	97.3



Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0229_QC102_230309	0229_QC353_230308	0229_MW101_230309	0229_MW114_230309	0229_MW128_230309
				Sampling date / time	09-Mar-2023 10:30	08-Mar-2023 17:10	09-Mar-2023 09:49	09-Mar-2023 11:30	09-Mar-2023 10:28
Compound	CAS Number	LOR	Unit	ET2301429-078	ET2301429-080	ET2301429-081	ET2301429-082	ET2301429-083	
				Result	Result	Result	Result	Result	
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	0.16	<0.02	0.16	4.24	0.24	
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	<0.02	0.03	4.09	0.25	
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	0.12	<0.01	0.15	21.9	2.75	
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	<0.02	<0.02	1.56	0.15	
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	0.14	<0.01	0.20	4.19	6.05	
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	0.04	
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	<0.1	<0.1	1.0	0.6	
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	<0.02	<0.02	1.46	0.40	
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	<0.02	0.02	8.01	0.73	
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	<0.02	<0.02	1.26	0.06	
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	<0.01	<0.01	2.02	0.15	
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	<0.06	<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	<0.06	<0.05	
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	<0.05	<0.05	<0.06	<0.05	



Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0229_QC102_230309	0229_QC353_230308	0229_MW101_230309	0229_MW114_230309	0229_MW128_230309
Sampling date / time				09-Mar-2023 10:30	08-Mar-2023 17:10	09-Mar-2023 09:49	09-Mar-2023 11:30	09-Mar-2023 10:28	
Compound	CAS Number	LOR	Unit	ET2301429-078	ET2301429-080	ET2301429-081	ET2301429-082	ET2301429-083	
				Result	Result	Result	Result	Result	
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	<0.05	<0.05	<0.06	<0.05	
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	<0.05	<0.05	<0.06	<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	0.42	<0.01	0.56	49.7	11.4	
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	0.26	<0.01	0.35	26.1	8.80	
Sum of PFAS (WA DER List)	----	0.01	µg/L	0.42	<0.01	0.53	44.1	11.0	
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%	98.2	102	97.8	97.0	97.2	
13C8-PFOA	----	0.02	%	98.9	97.5	93.1	99.7	95.5	



Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0229_MW102_230309	0229_MW131_230309	0229_MW018_230309	0229_MW072_230309	0229_MW106_230309
Sampling date / time				09-Mar-2023 10:00	09-Mar-2023 14:10	09-Mar-2023 13:10	09-Mar-2023 14:20	09-Mar-2023 13:45	
Compound	CAS Number	LOR	Unit	ET2301429-085	ET2301429-090	ET2301429-091	ET2301429-092	ET2301429-093	
				Result	Result	Result	Result	Result	
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	0.16	12.2	6.23	7.92	0.14	
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	0.07	10.3	5.46	7.03	0.04	
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	0.42	51.2	26.0	39.8	0.35	
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	0.04	3.60	1.78	3.24	<0.02	
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	0.42	75.5	38.4	76.3	0.18	
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	<0.09	<0.05	<0.10	<0.02	
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	2.8	1.0	0.7	<0.1	
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	4.82	1.82	1.86	<0.02	
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	0.06	19.9	9.89	10.0	0.07	
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	3.23	1.02	1.07	<0.02	
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	0.03	5.98	1.86	2.30	0.01	
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	<0.20	<0.05	2.27	<0.02	
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	<0.09	<0.05	<0.10	<0.02	
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	<0.09	<0.05	<0.10	<0.02	
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	<0.09	<0.05	<0.10	<0.02	
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	<0.09	<0.05	<0.10	<0.02	
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	<0.23	<0.12	<0.24	<0.05	
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	<0.09	<0.05	<0.10	<0.02	
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	<0.23	<0.12	<0.24	<0.05	
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	<0.23	<0.12	<0.24	<0.05	



Analytical Results

Sub-Matrix: GROUNDWATER
 (Matrix: WATER)

Sample ID

				0229_MW102_230309	0229_MW131_230309	0229_MW018_230309	0229_MW072_230309	0229_MW106_230309
Sampling date / time				09-Mar-2023 10:00	09-Mar-2023 14:10	09-Mar-2023 13:10	09-Mar-2023 14:20	09-Mar-2023 13:45
Compound	CAS Number	LOR	Unit	ET2301429-085	ET2301429-090	ET2301429-091	ET2301429-092	ET2301429-093
				Result	Result	Result	Result	Result
EP231C: Perfluoroalkyl Sulfonamides - Continued								
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	<0.23	<0.12	<0.24	<0.05
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	<0.23	<0.12	<0.24	<0.05
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	<0.09	<0.05	<0.10	<0.02
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	<0.09	<0.05	<0.10	<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	<0.09	<0.05	<0.10	<0.05
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	0.56	<0.05	<0.10	<0.05
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	<0.09	<0.05	<0.10	<0.05
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	<0.09	<0.05	<0.10	<0.05
EP231P: PFAS Sums								
Sum of PFAS	----	0.01	µg/L	1.20	190	93.5	152	0.79
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	0.84	127	64.4	116	0.53
Sum of PFAS (WA DER List)	----	0.01	µg/L	1.09	176	86.2	140	0.75
EP231S: PFAS Surrogate								
13C4-PFOS	----	0.02	%	104	97.7	96.6	97.3	102
13C8-PFOA	----	0.02	%	97.5	97.0	101	98.1	99.8



Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0229_MW141_230309	0229_MW139_230309	0229_MW074_230309	0229_MW135_230309	----
				Sampling date / time	09-Mar-2023 15:00	09-Mar-2023 15:45	09-Mar-2023 14:45	09-Mar-2023 13:30	----
Compound	CAS Number	LOR	Unit	ET2301429-094	ET2301429-095	ET2301429-096	ET2301429-097	-----	
				Result	Result	Result	Result	----	
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	0.19	0.12	6.00	0.21	----	
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	0.13	0.11	6.14	0.20	----	
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	0.96	1.04	41.4	2.45	----	
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	0.04	0.05	3.33	0.33	----	
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	0.44	1.93	51.0	11.8	----	
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	<0.02	<0.05	<0.02	----	
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	<0.1	0.8	<0.1	----	
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	0.04	<0.02	1.73	0.05	----	
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	0.23	0.08	9.32	0.27	----	
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	<0.02	1.26	0.03	----	
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	0.04	0.03	2.85	0.15	----	
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	<0.02	1.81	<0.02	----	
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	<0.02	<0.05	<0.02	----	
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	<0.02	<0.05	<0.02	----	
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	<0.02	<0.05	<0.02	----	
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	<0.02	<0.05	<0.02	----	
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	<0.05	<0.12	<0.05	----	
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	<0.02	<0.05	<0.02	----	
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	<0.05	<0.12	<0.05	----	
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	<0.05	<0.12	<0.05	----	



Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0229_MW141_230309	0229_MW139_230309	0229_MW074_230309	0229_MW135_230309	----
Sampling date / time				09-Mar-2023 15:00	09-Mar-2023 15:45	09-Mar-2023 14:45	09-Mar-2023 13:30	----	----
Compound	CAS Number	LOR	Unit	ET2301429-094	ET2301429-095	ET2301429-096	ET2301429-097	-----	-----
				Result	Result	Result	Result	----	----
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	<0.05	<0.12	<0.05	----	----
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	<0.05	<0.12	<0.05	----	----
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	<0.02	<0.05	<0.02	----	----
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	<0.02	<0.05	<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	0.08	<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	2.07	3.36	126	15.5	----	----
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	1.40	2.97	92.4	14.2	----	----
Sum of PFAS (WA DER List)	----	0.01	µg/L	1.90	3.20	114	15.0	----	----
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%	95.1	98.4	98.5	96.1	----	----
13C8-PFOA	----	0.02	%	96.5	92.7	101	95.7	----	----



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	0229_SD121_230306	0229_SD136_230306	0229_SD110_230306	0229_SD120_230306	0229_SD133_230306
Sampling date / time				06-Mar-2023 11:40	06-Mar-2023 11:23	06-Mar-2023 14:10	06-Mar-2023 12:20	06-Mar-2023 13:15	
Compound	CAS Number	LOR	Unit	ET2301429-020	ET2301429-021	ET2301429-022	ET2301429-023	ET2301429-024	
				Result	Result	Result	Result	Result	
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	<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	<0.0005
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	<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	<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	<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	<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	<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	<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	<0.0005
EP231P: PFAS Sums									
Sum of PFAS	----	0.0002	mg/kg	0.131	0.0006	0.0157	0.0042	0.0129	
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg	0.118	0.0006	0.0148	0.0042	0.0123	
Sum of PFAS (WA DER List)	----	0.0002	mg/kg	0.125	0.0006	0.0154	0.0042	0.0123	
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.0002	%	106	94.5	96.0	92.0	99.0	
13C8-PFOA	----	0.0002	%	94.0	87.0	98.0	104	102	



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	0229_SD140_230306	0229_SD139_230306	0229_QC151_230306	0229_SD135_230306	0229_SD109_230306
Sampling date / time				06-Mar-2023 14:40	06-Mar-2023 14:15	06-Mar-2023 11:23	06-Mar-2023 12:05	06-Mar-2023 13:37	
Compound	CAS Number	LOR	Unit	ET2301429-025	ET2301429-026	ET2301429-027	ET2301429-028	ET2301429-029	
				Result	Result	Result	Result	Result	
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content	----	0.1	%	23.4	30.6	26.6	29.0	28.9	
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	0.0004	0.0039	<0.0002	<0.0002	0.0024	
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	0.0042	<0.0002	<0.0002	0.0020	
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	0.0026	0.0330	0.0003	0.0012	0.0330	
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	0.0003	0.0024	<0.0002	<0.0002	0.0046	
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	0.0364	0.0682	0.0003	0.0014	0.377	
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	0.0006	0.0003	<0.0002	<0.0002	<0.0010	
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	<0.001	<0.001	<0.001	<0.005	
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	0.0008	<0.0002	<0.0002	<0.0010	
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	0.0004	0.0047	<0.0002	0.0003	0.0059	
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	0.0003	<0.0002	<0.0002	<0.0010	
Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	0.0003	0.0017	<0.0002	<0.0002	0.0032	
Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0010	
Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0010	
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0008	<0.0002	<0.0002	<0.0002	<0.0010	
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0010	
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0010	
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	<0.0005	<0.0025	
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	0.0056	
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0006	<0.0005	<0.0005	<0.0005	<0.0025	



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	0229_SD140_230306	0229_SD139_230306	0229_QC151_230306	0229_SD135_230306	0229_SD109_230306
Sampling date / time				06-Mar-2023 14:40	06-Mar-2023 14:15	06-Mar-2023 11:23	06-Mar-2023 12:05	06-Mar-2023 13:37	
Compound	CAS Number	LOR	Unit	ET2301429-025	ET2301429-026	ET2301429-027	ET2301429-028	ET2301429-029	
				Result	Result	Result	Result	Result	
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0006	<0.0005	<0.0005	<0.0005	<0.0025	
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	<0.0005	<0.0025	
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0006	<0.0005	<0.0005	<0.0005	<0.0025	
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	0.0002	<0.0002	<0.0002	<0.0002	<0.0010	
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0010	
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	<0.0010	
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	<0.0005	<0.0010	
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	<0.0005	<0.0010	
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	<0.0005	<0.0010	
EP231P: PFAS Sums									
Sum of PFAS	----	0.0002	mg/kg	0.0412	0.120	0.0006	0.0029	0.434	
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg	0.0390	0.101	0.0006	0.0026	0.410	
Sum of PFAS (WA DER List)	----	0.0002	mg/kg	0.0401	0.113	0.0006	0.0029	0.422	
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.0002	%	120	112	99.0	102	Not Determined	
13C8-PFOA	----	0.0002	%	99.0	88.0	98.0	91.5	Not Determined	



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	0229_SD217_230306	0229_SD129_230306	0229_QC153_230306	0229_SD132_230306	0229_SD128_230306
Sampling date / time				06-Mar-2023 15:00	06-Mar-2023 13:30	06-Mar-2023 13:30	06-Mar-2023 13:30	06-Mar-2023 13:15	06-Mar-2023 16:10
Compound	CAS Number	LOR	Unit	ET2301429-030	ET2301429-031	ET2301429-032	ET2301429-033	ET2301429-034	
				Result	Result	Result	Result	Result	
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	<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	<0.0005
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	<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	<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	<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	<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	<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	<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	<0.0005
EP231P: PFAS Sums									
Sum of PFAS	----	0.0002	mg/kg	0.0012	0.0014	0.0022	0.0105	0.0138	
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg	0.0012	0.0014	0.0022	0.0102	0.0131	
Sum of PFAS (WA DER List)	----	0.0002	mg/kg	0.0012	0.0014	0.0022	0.0105	0.0135	
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.0002	%	85.5	106	110	97.0	96.0	
13C8-PFOA	----	0.0002	%	97.5	97.5	110	92.5	100	



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	0229_SD130_230308	0229_SD126_230308	0229_SD227_230308	0229_SD134_230308	0229_SD244_230308
Sampling date / time				08-Mar-2023 09:48	08-Mar-2023 10:05	08-Mar-2023 12:10	08-Mar-2023 09:30	08-Mar-2023 11:10	
Compound	CAS Number	LOR	Unit	ET2301429-062	ET2301429-063	ET2301429-064	ET2301429-065	ET2301429-066	
				Result	Result	Result	Result	Result	
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content	----	0.1	%	33.1	28.5	35.5	56.6	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	<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	0.0034	<0.0002	<0.0002	0.0012	<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	
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	0229_SD130_230308	0229_SD126_230308	0229_SD227_230308	0229_SD134_230308	0229_SD244_230308
Sampling date / time				08-Mar-2023 09:48	08-Mar-2023 10:05	08-Mar-2023 12:10	08-Mar-2023 09:30	08-Mar-2023 11:10	
Compound	CAS Number	LOR	Unit	ET2301429-062	ET2301429-063	ET2301429-064	ET2301429-065	ET2301429-066	
				Result	Result	Result	Result	Result	
EP231C: Perfluoroalkyl Sulfonamides - Continued									
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	0.0034	<0.0002	<0.0002	0.0012	<0.0002	
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg	0.0034	<0.0002	<0.0002	0.0012	<0.0002	
Sum of PFAS (WA DER List)	----	0.0002	mg/kg	0.0034	<0.0002	<0.0002	0.0012	<0.0002	
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.0002	%	91.5	92.5	120	102	110	
13C8-PFOA	----	0.0002	%	99.5	90.5	126	104	108	



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	0229_SD232_230309	0229_SD220_230309	0229_SD242_230309	0229_SD205_230309	0229_SD243_230309
Sampling date / time				09-Mar-2023 16:24	09-Mar-2023 09:00	09-Mar-2023 09:30	09-Mar-2023 12:00	09-Mar-2023 10:50	
Compound	CAS Number	LOR	Unit	ET2301429-067	ET2301429-068	ET2301429-069	ET2301429-070	ET2301429-089	
				Result	Result	Result	Result	Result	
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content	----	0.1	%	54.5	41.2	28.7	31.4	34.8	
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	0.0003	0.0056	<0.0002	<0.0002	<0.0002	
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	0.0010	<0.0002	<0.0002	<0.0002	
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	0.0032	0.0166	0.0010	0.0008	0.0004	
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	0.0003	<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	
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	0229_SD232_230309	0229_SD220_230309	0229_SD242_230309	0229_SD205_230309	0229_SD243_230309
Sampling date / time				09-Mar-2023 16:24	09-Mar-2023 09:00	09-Mar-2023 09:30	09-Mar-2023 12:00	09-Mar-2023 10:50	
Compound	CAS Number	LOR	Unit	ET2301429-067	ET2301429-068	ET2301429-069	ET2301429-070	ET2301429-089	
				Result	Result	Result	Result	Result	
EP231C: Perfluoroalkyl Sulfonamides - Continued									
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	0.0035	0.0235	0.0010	0.0008	0.0004	
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg	0.0035	0.0222	0.0010	0.0008	0.0004	
Sum of PFAS (WA DER List)	----	0.0002	mg/kg	0.0035	0.0225	0.0010	0.0008	0.0004	
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.0002	%	106	103	107	94.0	101	
13C8-PFOA	----	0.0002	%	109	105	108	107	105	



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	0229_SD144_230310	0229_SD113_230310	0229_SD119_230310	0229_SD203_230308	0229_SD245_230308
Sampling date / time				10-Mar-2023 15:20	10-Mar-2023 14:50	10-Mar-2023 13:15	08-Mar-2023 16:50	08-Mar-2023 09:55	
Compound	CAS Number	LOR	Unit	ET2301429-102	ET2301429-103	ET2301429-104	ET2301429-106	ET2301429-107	
				Result	Result	Result	Result	Result	
EP231C: Perfluoroalkyl Sulfonamides - Continued									
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	0.281	0.0008	0.0055	0.0098	<0.0002	
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg	0.273	0.0008	0.0052	0.0096	<0.0002	
Sum of PFAS (WA DER List)	----	0.0002	mg/kg	0.276	0.0008	0.0055	0.0096	<0.0002	
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.0002	%	97.0	114	104	100	97.5	
13C8-PFOA	----	0.0002	%	106	102	110	112	108	



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)		Sample ID		0229_QC105_230306	----	----	----	----
		Sampling date / time		06-Mar-2023 15:00	----	----	----	----
Compound	CAS Number	LOR	Unit	ET2301429-108	-----	-----	-----	-----
				Result	----	----	----	----
EA055: Moisture Content (Dried @ 105-110°C)								
Moisture Content	----	0.1	%	37.3	----	----	----	----
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	0.0015	----	----	----	----
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	----	----	----	----
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	----	----	----	----



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Sample ID	0229_QC105_230306	----	----	----	----
Sampling date / time			06-Mar-2023 15:00	----	----	----	----	----
Compound	CAS Number	LOR	Unit	ET2301429-108	-----	-----	-----	-----
				Result	----	----	----	----
EP231C: Perfluoroalkyl Sulfonamides - Continued								
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	0.0015	----	----	----	----
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg	0.0015	----	----	----	----
Sum of PFAS (WA DER List)	----	0.0002	mg/kg	0.0015	----	----	----	----
EP231S: PFAS Surrogate								
13C4-PFOS	----	0.0002	%	114	----	----	----	----
13C8-PFOA	----	0.0002	%	106	----	----	----	----



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	0229_MW220S_23030 7	0229_MW233_230307	0229_MW212_230307	0229_SW132_230306 Surface water	0229_SW140_230306
Sampling date / time					07-Mar-2023 13:09	07-Mar-2023 14:01	07-Mar-2023 14:16	06-Mar-2023 15:38	06-Mar-2023 14:45
Compound	CAS Number	LOR	Unit	ET2301429-001	ET2301429-002	ET2301429-003	ET2301429-004	ET2301429-005	
				Result	Result	Result	Result	Result	
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	0.20	<0.02	<0.02	0.14	0.10	
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	0.13	<0.02	<0.02	0.10	0.07	
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	0.68	<0.01	<0.01	0.82	0.61	
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	<0.02	<0.02	0.05	0.04	
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	0.02	0.02	<0.01	1.20	0.91	
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	0.04	0.03	
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	<0.02	<0.02	0.20	0.17	
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	0.06	0.05	
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02	
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02	
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02	
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02	
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02	
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05	
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02	
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05	
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05	



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	0229_MW220S_23030 7	0229_MW233_230307	0229_MW212_230307	0229_SW132_230306 Surface water	0229_SW140_230306
Sampling date / time					07-Mar-2023 13:09	07-Mar-2023 14:01	07-Mar-2023 14:16	06-Mar-2023 15:38	06-Mar-2023 14:45
Compound	CAS Number	LOR	Unit	ET2301429-001	ET2301429-002	ET2301429-003	ET2301429-004	ET2301429-005	
				Result	Result	Result	Result	Result	
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	<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	<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	<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	<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	<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	<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	<0.05
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L	1.03	0.02	<0.01	2.63	1.98	
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	0.70	0.02	<0.01	2.02	1.52	
Sum of PFAS (WA DER List)	----	0.01	µg/L	0.90	0.02	<0.01	2.48	1.87	
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%	101	98.3	103	101	96.3	
13C8-PFOA	----	0.02	%	101	101	101	99.9	98.3	



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	0229_SW133_230306	0229_SW136_230306	0229_SW109_230306	0229_SW139_230306	0229_SW217_230306
Sampling date / time				06-Mar-2023 13:17	06-Mar-2023 11:23	06-Mar-2023 13:40	06-Mar-2023 14:16	06-Mar-2023 15:00	
Compound	CAS Number	LOR	Unit	ET2301429-006	ET2301429-007	ET2301429-008	ET2301429-009	ET2301429-010	
				Result	Result	Result	Result	Result	
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	0.09	0.06	7.23	0.16	0.03	
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	0.04	0.03	6.83	0.13	<0.02	
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	0.41	0.31	51.4	1.00	0.04	
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	<0.02	3.57	0.06	<0.02	
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	0.26	0.30	82.2	1.34	0.02	
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	<0.02	<0.10	<0.02	<0.02	
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	<0.1	1.5	<0.1	<0.1	
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	<0.02	3.48	0.06	<0.02	
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	0.06	0.07	16.8	0.28	<0.02	
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	<0.02	2.06	0.03	<0.02	
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	0.01	0.01	4.82	0.08	<0.01	
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	<0.02	0.21	<0.02	<0.02	
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	<0.02	<0.10	<0.02	<0.02	
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	<0.02	<0.10	<0.02	<0.02	
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	<0.02	<0.10	<0.02	<0.02	
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	<0.02	<0.10	<0.02	<0.02	
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	<0.05	<0.25	<0.05	<0.05	
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	<0.02	0.41	<0.02	<0.02	
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	<0.05	<0.25	<0.05	<0.05	
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	<0.05	<0.25	<0.05	<0.05	



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	0229_SW133_230306	0229_SW136_230306	0229_SW109_230306	0229_SW139_230306	0229_SW217_230306
Sampling date / time				06-Mar-2023 13:17	06-Mar-2023 11:23	06-Mar-2023 13:40	06-Mar-2023 14:16	06-Mar-2023 15:00	
Compound	CAS Number	LOR	Unit	ET2301429-006	ET2301429-007	ET2301429-008	ET2301429-009	ET2301429-010	
				Result	Result	Result	Result	Result	
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	<0.05	<0.25	<0.05	<0.05	
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	<0.05	<0.25	<0.05	<0.05	
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	<0.02	<0.10	<0.02	<0.02	
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	<0.02	<0.10	<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	<0.10	<0.05	<0.05	
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	<0.05	0.10	<0.05	<0.05	
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	<0.05	<0.10	<0.05	<0.05	
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	<0.05	<0.10	<0.05	<0.05	
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L	0.87	0.78	181	3.14	0.09	
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	0.67	0.61	134	2.34	0.06	
Sum of PFAS (WA DER List)	----	0.01	µg/L	0.83	0.75	170	2.95	0.09	
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%	100	106	99.9	101	102	
13C8-PFOA	----	0.02	%	100	99.9	95.6	98.1	97.9	



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	0229_SW233_230306	0229_SW135_230306	0229_SW128_230306	0229_SW203_230306	0229_QC150_230306
Sampling date / time				06-Mar-2023 15:48	06-Mar-2023 12:00	06-Mar-2023 04:10	06-Mar-2023 16:30	06-Mar-2023 11:23	
Compound	CAS Number	LOR	Unit	ET2301429-011	ET2301429-012	ET2301429-013	ET2301429-014	ET2301429-015	
				Result	Result	Result	Result	Result	
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	0.14	0.21	0.07	0.13	0.06	
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	0.10	0.12	0.03	0.09	0.03	
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	0.81	0.81	0.21	0.75	0.31	
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	0.05	0.03	<0.02	0.05	<0.02	
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	1.12	0.32	0.13	1.05	0.38	
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	0.03	0.06	<0.02	0.03	<0.02	
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	0.20	0.28	0.05	0.16	0.08	
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	0.06	0.06	<0.01	0.04	0.01	
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02	
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02	
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02	
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02	
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02	
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05	
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02	
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05	
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05	



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	0229_SW233_230306	0229_SW135_230306	0229_SW128_230306	0229_SW203_230306	0229_QC150_230306
Sampling date / time				06-Mar-2023 15:48	06-Mar-2023 12:00	06-Mar-2023 04:10	06-Mar-2023 16:30	06-Mar-2023 11:23	
Compound	CAS Number	LOR	Unit	ET2301429-011	ET2301429-012	ET2301429-013	ET2301429-014	ET2301429-015	
				Result	Result	Result	Result	Result	
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05	
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05	
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02	
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02	
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05	
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05	
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05	
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05	
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L	2.53	1.92	0.49	2.30	0.87	
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	1.93	1.13	0.34	1.80	0.69	
Sum of PFAS (WA DER List)	----	0.01	µg/L	2.38	1.77	0.46	2.16	0.84	
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%	101	102	103	104	109	
13C8-PFOA	----	0.02	%	100	103	102	96.2	100	



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	0229_QC350_230306	0229_QC100_230306	0229_QC152_230306	0229_SW129_230306	0229_MW119_230307
Sampling date / time				06-Mar-2023 16:20	06-Mar-2023 15:00	06-Mar-2023 13:30	06-Mar-2023 13:30	07-Mar-2023 16:40	
Compound	CAS Number	LOR	Unit	ET2301429-016	ET2301429-017	ET2301429-018	ET2301429-019	ET2301429-035	
				Result	Result	Result	Result	Result	
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.03	0.10	0.09	0.36	
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	<0.02	0.04	0.04	<0.02	
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	0.04	0.30	0.31	0.06	
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	0.02	0.20	0.20	0.04	
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	0.17	0.17	0.20	
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	<0.02	0.15	0.15	0.19	
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	<0.02	0.05	0.04	0.15	
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	<0.01	0.04	0.04	0.13	
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02	
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02	
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02	
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02	
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02	
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05	
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02	
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05	
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05	



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	0229_QC350_230306	0229_QC100_230306	0229_QC152_230306	0229_SW129_230306	0229_MW119_230307
Sampling date / time				06-Mar-2023 16:20	06-Mar-2023 15:00	06-Mar-2023 13:30	06-Mar-2023 13:30	07-Mar-2023 16:40	
Compound	CAS Number	LOR	Unit	ET2301429-016	ET2301429-017	ET2301429-018	ET2301429-019	ET2301429-035	
				Result	Result	Result	Result	Result	
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05	
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05	
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02	
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02	
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05	
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05	
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05	
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05	
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L	<0.01	0.09	1.15	1.14	1.13	
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	<0.01	0.06	0.50	0.51	0.10	
Sum of PFAS (WA DER List)	----	0.01	µg/L	<0.01	0.09	1.11	1.10	1.13	
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%	104	103	106	109	102	
13C8-PFOA	----	0.02	%	103	102	101	98.7	95.1	



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	0229_SW126_230308	0229_SW134_230308	0229_SW227_230308	0229_SW244_230308	0229_QC301_230307
Sampling date / time				08-Mar-2023 15:48	08-Mar-2023 09:30	08-Mar-2023 12:05	08-Mar-2023 23:15	07-Mar-2023 16:00	
Compound	CAS Number	LOR	Unit	ET2301429-043	ET2301429-047	ET2301429-048	ET2301429-051	ET2301429-057	
				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	
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05	



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	0229_SW126_230308	0229_SW134_230308	0229_SW227_230308	0229_SW244_230308	0229_QC301_230307
Sampling date / time				08-Mar-2023 15:48	08-Mar-2023 09:30	08-Mar-2023 12:05	08-Mar-2023 23:15	07-Mar-2023 16:00	
Compound	CAS Number	LOR	Unit	ET2301429-043	ET2301429-047	ET2301429-048	ET2301429-051	ET2301429-057	
				Result	Result	Result	Result	Result	
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05	
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05	
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02	
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02	
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05	
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05	
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05	
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05	
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L	<0.01	<0.01	<0.01	<0.01	<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	%	102	107	99.8	103	103	
13C8-PFOA	----	0.02	%	102	100	98.2	101	98.8	



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	0229_SW130_230308	0229_SW232_230309	0229_SW205_230309	0229_SW242_230309	0229_SW220_230309
Sampling date / time				08-Mar-2023 21:50	09-Mar-2023 09:50	09-Mar-2023 12:00	09-Mar-2023 09:25	09-Mar-2023 09:00	
Compound	CAS Number	LOR	Unit	ET2301429-059	ET2301429-071	ET2301429-076	ET2301429-079	ET2301429-087	
				Result	Result	Result	Result	Result	
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	0.06	0.04	<0.05	0.05	0.07	
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	0.04	<0.02	<0.05	<0.02	0.04	
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	0.23	0.11	<0.05	0.16	0.36	
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	<0.02	<0.05	<0.02	<0.02	
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	0.08	0.08	0.09	0.25	0.27	
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	<0.02	<0.05	<0.02	<0.02	
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	<0.1	<0.2	<0.1	<0.1	
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	<0.02	<0.05	<0.02	<0.02	
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	0.04	0.02	<0.05	0.03	0.06	
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	<0.02	<0.05	<0.02	<0.02	
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	<0.01	<0.05	<0.01	<0.01	
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	<0.02	<0.05	<0.02	<0.02	
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	<0.02	<0.05	<0.02	<0.02	
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	<0.02	<0.05	<0.02	<0.02	
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	<0.02	<0.05	<0.02	<0.02	
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	<0.02	<0.05	<0.02	<0.02	
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	<0.05	<0.13	<0.05	<0.05	
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	<0.02	<0.05	<0.02	<0.02	
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	<0.05	<0.13	<0.05	<0.05	
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	<0.05	<0.13	<0.05	<0.05	



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	0229_SW130_230308	0229_SW232_230309	0229_SW205_230309	0229_SW242_230309	0229_SW220_230309
Sampling date / time				08-Mar-2023 21:50	09-Mar-2023 09:50	09-Mar-2023 12:00	09-Mar-2023 09:25	09-Mar-2023 09:00	
Compound	CAS Number	LOR	Unit	ET2301429-059	ET2301429-071	ET2301429-076	ET2301429-079	ET2301429-087	
				Result	Result	Result	Result	Result	
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	<0.05	<0.13	<0.05	<0.05	
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	<0.05	<0.13	<0.05	<0.05	
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	<0.02	<0.05	<0.02	<0.02	
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	<0.02	<0.05	<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	0.45	0.25	0.09	0.49	0.80	
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	0.31	0.19	0.09	0.41	0.63	
Sum of PFAS (WA DER List)	----	0.01	µg/L	0.41	0.25	0.09	0.49	0.76	
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%	110	92.1	101	101	102	
13C8-PFOA	----	0.02	%	103	95.3	98.6	101	93.9	



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	0229_SW243_230309	0229_SW113_230310	0229_SW119_230310	0229_SW144_230310	0229_MW116_230310
Sampling date / time				09-Mar-2023 09:30	10-Mar-2023 14:50	10-Mar-2023 13:15	10-Mar-2023 15:20	10-Mar-2023 13:50	
Compound	CAS Number	LOR	Unit	ET2301429-088	ET2301429-098	ET2301429-099	ET2301429-100	ET2301429-101	
				Result	Result	Result	Result	Result	
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.04	0.26	0.02	0.14	
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	<0.02	0.16	<0.02	0.04	
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	0.02	0.15	0.80	0.08	0.11	
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	<0.02	0.04	<0.02	<0.02	
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	0.04	0.09	0.68	0.11	<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	0.06	<0.02	<0.02	
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	0.02	0.34	<0.02	0.04	
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	<0.02	0.04	<0.02	<0.02	
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	<0.01	0.06	<0.01	<0.01	
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02	
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02	
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02	
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02	
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02	
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05	
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02	
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05	
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05	



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	0229_SW243_230309	0229_SW113_230310	0229_SW119_230310	0229_SW144_230310	0229_MW116_230310
Sampling date / time					09-Mar-2023 09:30	10-Mar-2023 14:50	10-Mar-2023 13:15	10-Mar-2023 15:20	10-Mar-2023 13:50
Compound	CAS Number	LOR	Unit	ET2301429-088	ET2301429-098	ET2301429-099	ET2301429-100	ET2301429-101	ET2301429-101
				Result	Result	Result	Result	Result	Result
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	<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	<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	<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	<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	<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	<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	<0.05
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L	0.06	0.30	2.44	0.21	0.33	0.33
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	0.06	0.24	1.48	0.19	0.11	0.11
Sum of PFAS (WA DER List)	----	0.01	µg/L	0.06	0.30	2.24	0.21	0.29	0.29
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%	102	103	99.7	103	99.9	99.9
13C8-PFOA	----	0.02	%	97.9	98.1	98.0	96.6	101	101



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)			Sample ID		0229_SW245_220308	0229_QC300_230308	----	----	----
			Sampling date / time		08-Mar-2023 09:50	08-Mar-2023 17:00	----	----	----
Compound	CAS Number	LOR	Unit	ET2301429-105	ET2301429-109	-----	-----	-----	
				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	----	----	----	
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	<0.05	----	----	----	



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	0229_SW245_220308	0229_QC300_230308	----	----	----
Sampling date / time				08-Mar-2023 09:50	08-Mar-2023 17:00	----	----	----	
Compound	CAS Number	LOR	Unit	ET2301429-105	ET2301429-109	-----	-----	-----	
				Result	Result	----	----	----	
EP231C: Perfluoroalkyl Sulfonamides - Continued									
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	93.4	----	----	----	
13C8-PFOA	----	0.02	%	102	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

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

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

Inter-Laboratory Testing

Analysis conducted by ALS Brisbane, NATA accreditation no. 825, site no. 818 (Chemistry) 18958 (Biology).

(WATER) EP231P: PFAS Sums

(WATER) EP231S: PFAS Surrogate

(WATER) EP231A: Perfluoroalkyl Sulfonic Acids

(WATER) EP231B: Perfluoroalkyl Carboxylic Acids

(WATER) EP231C: Perfluoroalkyl Sulfonamides

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

(SOIL) EP231B: Perfluoroalkyl Carboxylic Acids

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

(SOIL) EP231C: Perfluoroalkyl Sulfonamides

(SOIL) EP231A: Perfluoroalkyl Sulfonic Acids

(SOIL) EP231P: PFAS Sums

(SOIL) EP231S: PFAS Surrogate

(SOIL) EA055: Moisture Content (Dried @ 105-110°C)

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: ET2301429	Page	: 1 of 19
Client	: [REDACTED]	Laboratory	: [REDACTED]
Contact	: [REDACTED]	Telephone	: [REDACTED]
Project	: QLD_0229_PFASOMP_23	Date Samples Received	: 14-Mar-2023
Site	: QLD_0229	Issue Date	: 28-Mar-2023
Sampler	: [REDACTED]	No. of samples received	: 109
Order number	: 60612487 task 3.1	No. of samples analysed	: 107

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							
EP231A: Perfluoroalkyl Sulfonic Acids	ET2301429--082	0229_MW114_230309	Perfluorohexane sulfonic acid (PFHxS)	355-46-4	Not Determined	----	MS recovery not determined, background level greater than or equal to 4x spike level.
EP231B: Perfluoroalkyl Carboxylic Acids	ET2301429--082	0229_MW114_230309	Perfluorohexanoic acid (PFHxA)	307-24-4	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: 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) 0229_SD121_230306, 0229_SD110_230306, 0229_SD133_230306, 0229_SD139_230306, 0229_SD135_230306, 0229_SD217_230306, 0229_QC153_230306, 0229_SD128_230306,	0229_SD136_230306, 0229_SD120_230306, 0229_SD140_230306, 0229_QC151_230306, 0229_SD109_230306, 0229_SD129_230306, 0229_SD132_230306, 0229_QC105_230306	06-Mar-2023	----	----	----	15-Mar-2023	20-Mar-2023	✓
HDPE Soil Jar (EA055) 0229_SD130_230308, 0229_SD227_230308, 0229_SD244_230308, 0229_SD245_230308	0229_SD126_230308, 0229_SD134_230308, 0229_SD203_230308,	08-Mar-2023	----	----	----	15-Mar-2023	22-Mar-2023	✓
HDPE Soil Jar (EA055) 0229_SD232_230309, 0229_SD242_230309, 0229_SD243_230309	0229_SD220_230309, 0229_SD205_230309,	09-Mar-2023	----	----	----	15-Mar-2023	23-Mar-2023	✓
HDPE Soil Jar (EA055) 0229_SD144_230310, 0229_SD119_230310	0229_SD113_230310,	10-Mar-2023	----	----	----	15-Mar-2023	24-Mar-2023	✓



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	
EP231A: Perfluoroalkyl Sulfonic Acids								
HDPE Soil Jar (EP231X) 0229_SD121_230306, 0229_SD110_230306, 0229_SD133_230306, 0229_SD139_230306, 0229_SD135_230306, 0229_SD217_230306, 0229_QC153_230306, 0229_SD128_230306	0229_SD136_230306, 0229_SD120_230306, 0229_SD140_230306, 0229_QC151_230306, 0229_SD109_230306, 0229_SD129_230306, 0229_SD132_230306,	06-Mar-2023	18-Mar-2023	02-Sep-2023	✓	21-Mar-2023	27-Apr-2023	✓
HDPE Soil Jar (EP231X) 0229_QC105_230306		06-Mar-2023	23-Mar-2023	02-Sep-2023	✓	27-Mar-2023	02-May-2023	✓
HDPE Soil Jar (EP231X) 0229_SD130_230308, 0229_SD227_230308	0229_SD126_230308,	08-Mar-2023	18-Mar-2023	04-Sep-2023	✓	21-Mar-2023	27-Apr-2023	✓
HDPE Soil Jar (EP231X) 0229_SD134_230308, 0229_SD203_230308,	0229_SD244_230308, 0229_SD245_230308	08-Mar-2023	23-Mar-2023	04-Sep-2023	✓	27-Mar-2023	02-May-2023	✓
HDPE Soil Jar (EP231X) 0229_SD232_230309, 0229_SD242_230309, 0229_SD243_230309	0229_SD220_230309, 0229_SD205_230309,	09-Mar-2023	23-Mar-2023	05-Sep-2023	✓	27-Mar-2023	02-May-2023	✓
HDPE Soil Jar (EP231X) 0229_SD144_230310, 0229_SD119_230310	0229_SD113_230310,	10-Mar-2023	23-Mar-2023	06-Sep-2023	✓	27-Mar-2023	02-May-2023	✓



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	
EP231B: Perfluoroalkyl Carboxylic Acids								
HDPE Soil Jar (EP231X) 0229_SD121_230306, 0229_SD110_230306, 0229_SD133_230306, 0229_SD139_230306, 0229_SD135_230306, 0229_SD217_230306, 0229_QC153_230306, 0229_SD128_230306	0229_SD136_230306, 0229_SD120_230306, 0229_SD140_230306, 0229_QC151_230306, 0229_SD109_230306, 0229_SD129_230306, 0229_SD132_230306,	06-Mar-2023	18-Mar-2023	02-Sep-2023	✓	21-Mar-2023	27-Apr-2023	✓
HDPE Soil Jar (EP231X) 0229_QC105_230306		06-Mar-2023	23-Mar-2023	02-Sep-2023	✓	27-Mar-2023	02-May-2023	✓
HDPE Soil Jar (EP231X) 0229_SD130_230308, 0229_SD227_230308	0229_SD126_230308,	08-Mar-2023	18-Mar-2023	04-Sep-2023	✓	21-Mar-2023	27-Apr-2023	✓
HDPE Soil Jar (EP231X) 0229_SD134_230308, 0229_SD203_230308,	0229_SD244_230308, 0229_SD245_230308	08-Mar-2023	23-Mar-2023	04-Sep-2023	✓	27-Mar-2023	02-May-2023	✓
HDPE Soil Jar (EP231X) 0229_SD232_230309, 0229_SD242_230309, 0229_SD243_230309	0229_SD220_230309, 0229_SD205_230309,	09-Mar-2023	23-Mar-2023	05-Sep-2023	✓	27-Mar-2023	02-May-2023	✓
HDPE Soil Jar (EP231X) 0229_SD144_230310, 0229_SD119_230310	0229_SD113_230310,	10-Mar-2023	23-Mar-2023	06-Sep-2023	✓	27-Mar-2023	02-May-2023	✓



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) 0229_SD121_230306, 0229_SD110_230306, 0229_SD133_230306, 0229_SD139_230306, 0229_SD135_230306, 0229_SD217_230306, 0229_QC153_230306, 0229_SD128_230306	0229_SD136_230306, 0229_SD120_230306, 0229_SD140_230306, 0229_QC151_230306, 0229_SD109_230306, 0229_SD129_230306, 0229_SD132_230306,	06-Mar-2023	18-Mar-2023	02-Sep-2023	✓	21-Mar-2023	27-Apr-2023	✓
HDPE Soil Jar (EP231X) 0229_QC105_230306		06-Mar-2023	23-Mar-2023	02-Sep-2023	✓	27-Mar-2023	02-May-2023	✓
HDPE Soil Jar (EP231X) 0229_SD130_230308, 0229_SD227_230308	0229_SD126_230308,	08-Mar-2023	18-Mar-2023	04-Sep-2023	✓	21-Mar-2023	27-Apr-2023	✓
HDPE Soil Jar (EP231X) 0229_SD134_230308, 0229_SD203_230308,	0229_SD244_230308, 0229_SD245_230308	08-Mar-2023	23-Mar-2023	04-Sep-2023	✓	27-Mar-2023	02-May-2023	✓
HDPE Soil Jar (EP231X) 0229_SD232_230309, 0229_SD242_230309, 0229_SD243_230309	0229_SD220_230309, 0229_SD205_230309,	09-Mar-2023	23-Mar-2023	05-Sep-2023	✓	27-Mar-2023	02-May-2023	✓
HDPE Soil Jar (EP231X) 0229_SD144_230310, 0229_SD119_230310	0229_SD113_230310,	10-Mar-2023	23-Mar-2023	06-Sep-2023	✓	27-Mar-2023	02-May-2023	✓



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) 0229_SD121_230306, 0229_SD110_230306, 0229_SD133_230306, 0229_SD139_230306, 0229_SD135_230306, 0229_SD217_230306, 0229_QC153_230306, 0229_SD128_230306	0229_SD136_230306, 0229_SD120_230306, 0229_SD140_230306, 0229_QC151_230306, 0229_SD109_230306, 0229_SD129_230306, 0229_SD132_230306,	06-Mar-2023	18-Mar-2023	02-Sep-2023	✓	21-Mar-2023	27-Apr-2023	✓
HDPE Soil Jar (EP231X) 0229_QC105_230306		06-Mar-2023	23-Mar-2023	02-Sep-2023	✓	27-Mar-2023	02-May-2023	✓
HDPE Soil Jar (EP231X) 0229_SD130_230308, 0229_SD227_230308	0229_SD126_230308,	08-Mar-2023	18-Mar-2023	04-Sep-2023	✓	21-Mar-2023	27-Apr-2023	✓
HDPE Soil Jar (EP231X) 0229_SD134_230308, 0229_SD203_230308,	0229_SD244_230308, 0229_SD245_230308	08-Mar-2023	23-Mar-2023	04-Sep-2023	✓	27-Mar-2023	02-May-2023	✓
HDPE Soil Jar (EP231X) 0229_SD232_230309, 0229_SD242_230309, 0229_SD243_230309	0229_SD220_230309, 0229_SD205_230309,	09-Mar-2023	23-Mar-2023	05-Sep-2023	✓	27-Mar-2023	02-May-2023	✓
HDPE Soil Jar (EP231X) 0229_SD144_230310, 0229_SD119_230310	0229_SD113_230310,	10-Mar-2023	23-Mar-2023	06-Sep-2023	✓	27-Mar-2023	02-May-2023	✓



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) 0229_SD121_230306, 0229_SD110_230306, 0229_SD133_230306, 0229_SD139_230306, 0229_SD135_230306, 0229_SD217_230306, 0229_QC153_230306, 0229_SD128_230306	0229_SD136_230306, 0229_SD120_230306, 0229_SD140_230306, 0229_QC151_230306, 0229_SD109_230306, 0229_SD129_230306, 0229_SD132_230306,	06-Mar-2023	18-Mar-2023	02-Sep-2023	✓	21-Mar-2023	27-Apr-2023	✓
HDPE Soil Jar (EP231X) 0229_QC105_230306		06-Mar-2023	23-Mar-2023	02-Sep-2023	✓	27-Mar-2023	02-May-2023	✓
HDPE Soil Jar (EP231X) 0229_SD130_230308, 0229_SD227_230308	0229_SD126_230308,	08-Mar-2023	18-Mar-2023	04-Sep-2023	✓	21-Mar-2023	27-Apr-2023	✓
HDPE Soil Jar (EP231X) 0229_SD134_230308, 0229_SD203_230308,	0229_SD244_230308, 0229_SD245_230308	08-Mar-2023	23-Mar-2023	04-Sep-2023	✓	27-Mar-2023	02-May-2023	✓
HDPE Soil Jar (EP231X) 0229_SD232_230309, 0229_SD242_230309, 0229_SD243_230309	0229_SD220_230309, 0229_SD205_230309,	09-Mar-2023	23-Mar-2023	05-Sep-2023	✓	27-Mar-2023	02-May-2023	✓
HDPE Soil Jar (EP231X) 0229_SD144_230310, 0229_SD119_230310	0229_SD113_230310,	10-Mar-2023	23-Mar-2023	06-Sep-2023	✓	27-Mar-2023	02-May-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



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 - Continued									
0229_SW232_230309, 0229_MW138_230309, 0229_MW105_230309, 0229_QC103_230309, 0229_SW242_230309, 0229_MW114_230309, 0229_MW102_230309, 0229_SW243_230309, 0229_MW018_230309, 0229_MW106_230309, 0229_MW139_230309, 0229_MW135_230309	0229_MW232_230309, 0229_MW118_230309, 0229_SW205_230309, 0229_QC102_230309, 0229_MW101_230309, 0229_MW128_230309, 0229_SW220_230309, 0229_MW131_230309, 0229_MW072_230309, 0229_MW141_230309, 0229_MW074_230309,	09-Mar-2023	23-Mar-2023	05-Sep-2023	✓	27-Mar-2023	05-Sep-2023	✓	
HDPE (no PTFE) (EP231X) 0229_SW113_230310, 0229_SW144_230310,	0229_SW119_230310, 0229_MW116_230310	10-Mar-2023	23-Mar-2023	06-Sep-2023	✓	27-Mar-2023	06-Sep-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		
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
0229_SW232_230309, 0229_MW138_230309, 0229_MW105_230309, 0229_QC103_230309, 0229_SW242_230309, 0229_MW114_230309, 0229_MW102_230309, 0229_SW243_230309, 0229_MW018_230309, 0229_MW106_230309, 0229_MW139_230309, 0229_MW135_230309	0229_MW232_230309, 0229_MW118_230309, 0229_SW205_230309, 0229_QC102_230309, 0229_MW101_230309, 0229_MW128_230309, 0229_SW220_230309, 0229_MW131_230309, 0229_MW072_230309, 0229_MW141_230309, 0229_MW074_230309,	09-Mar-2023	23-Mar-2023	05-Sep-2023	✓	27-Mar-2023	05-Sep-2023	✓	
HDPE (no PTFE) (EP231X) 0229_SW113_230310, 0229_SW144_230310,	0229_SW119_230310, 0229_MW116_230310	10-Mar-2023	23-Mar-2023	06-Sep-2023	✓	27-Mar-2023	06-Sep-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		
EP231C: Perfluoroalkyl Sulfonamides - Continued									
0229_SW232_230309, 0229_MW138_230309, 0229_MW105_230309, 0229_QC103_230309, 0229_SW242_230309, 0229_MW114_230309, 0229_MW102_230309, 0229_SW243_230309, 0229_MW018_230309, 0229_MW106_230309, 0229_MW139_230309, 0229_MW135_230309	0229_MW232_230309, 0229_MW118_230309, 0229_SW205_230309, 0229_QC102_230309, 0229_MW101_230309, 0229_MW128_230309, 0229_SW220_230309, 0229_MW131_230309, 0229_MW072_230309, 0229_MW141_230309, 0229_MW074_230309,	09-Mar-2023	23-Mar-2023	05-Sep-2023	✓	27-Mar-2023	05-Sep-2023	✓	
HDPE (no PTFE) (EP231X) 0229_SW113_230310, 0229_SW144_230310,	0229_SW119_230310, 0229_MW116_230310	10-Mar-2023	23-Mar-2023	06-Sep-2023	✓	27-Mar-2023	06-Sep-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	
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued								
0229_SW232_230309, 0229_MW138_230309, 0229_MW105_230309, 0229_QC103_230309, 0229_SW242_230309, 0229_MW114_230309, 0229_MW102_230309, 0229_SW243_230309, 0229_MW018_230309, 0229_MW106_230309, 0229_MW139_230309, 0229_MW135_230309	0229_MW232_230309, 0229_MW118_230309, 0229_SW205_230309, 0229_QC102_230309, 0229_MW101_230309, 0229_MW128_230309, 0229_SW220_230309, 0229_MW131_230309, 0229_MW072_230309, 0229_MW141_230309, 0229_MW074_230309,	09-Mar-2023	23-Mar-2023	05-Sep-2023	✓	27-Mar-2023	05-Sep-2023	✓
HDPE (no PTFE) (EP231X) 0229_SW113_230310, 0229_SW144_230310,	0229_SW119_230310, 0229_MW116_230310	10-Mar-2023	23-Mar-2023	06-Sep-2023	✓	27-Mar-2023	06-Sep-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		
EP231P: PFAS Sums - Continued									
0229_SW232_230309, 0229_MW138_230309, 0229_MW105_230309, 0229_QC103_230309, 0229_SW242_230309, 0229_MW114_230309, 0229_MW102_230309, 0229_SW243_230309, 0229_MW018_230309, 0229_MW106_230309, 0229_MW139_230309, 0229_MW135_230309	0229_MW232_230309, 0229_MW118_230309, 0229_SW205_230309, 0229_QC102_230309, 0229_MW101_230309, 0229_MW128_230309, 0229_SW220_230309, 0229_MW131_230309, 0229_MW072_230309, 0229_MW141_230309, 0229_MW074_230309,	09-Mar-2023	23-Mar-2023	05-Sep-2023	✓	27-Mar-2023	05-Sep-2023	✓	
HDPE (no PTFE) (EP231X) 0229_SW113_230310, 0229_SW144_230310,	0229_SW119_230310, 0229_MW116_230310	10-Mar-2023	23-Mar-2023	06-Sep-2023	✓	27-Mar-2023	06-Sep-2023	✓	



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	Method	Count		Rate (%)			Quality Control Specification
		QC	Regular	Actual	Expected	Evaluation	
Analytical Methods							
Laboratory Duplicates (DUP)							
Moisture Content	EA055	4	33	12.12	10.00	✔	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	4	33	12.12	10.00	✔	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	33	6.06	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	33	6.06	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	33	6.06	5.00	✔	NEPM 2013 B3 & ALS QC Standard

Matrix: WATER

Evaluation: ✖ = Quality Control frequency not within specification ; ✔ = Quality Control frequency within specification.

Quality Control Sample Type	Method	Count		Rate (%)			Quality Control Specification
		QC	Regular	Actual	Expected	Evaluation	
Analytical Methods							
Laboratory Duplicates (DUP)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	10	93	10.75	10.00	✔	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	5	93	5.38	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	5	93	5.38	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	5	93	5.38	5.00	✔	NEPM 2013 B3 & ALS QC Standard



Brief Method Summaries

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

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

QUALITY CONTROL REPORT

Work Order : ET2301429 Client : ██████████ Contact : ██████████ Address : ██████████ Telephone : ---- Project : QLD_0229_PFASOMP_23 Order number : 60612487 task 3.1 C-O-C number : 49308 Sampler : ██████████ Site : QLD_0229 Quote number : TV/007/21 v2 - Compass No. of samples received : 109 No. of samples analysed : 107	Page : 1 of 32 Laboratory : ██████████ Contact : ██████████ Address : ██████████ Telephone : ██████████ Date Samples Received : 14-Mar-2023 Date Analysis Commenced : 15-Mar-2023 Issue Date : 28-Mar-2023
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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
██████████	Senior Chemist - Organics	Brisbane Organics, Stafford, QLD
██████████	Senior Inorganic Chemist	Brisbane Inorganics, Stafford, QLD
██████████	Senior Chemist - Organics	Brisbane Organics, Stafford, QLD



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: 4931498)									
ET2301427-001	Anonymous	EA055: Moisture Content	----	0.1	%	22.1	25.0	12.5	0% - 20%
ET2301429-028	0229_SD135_230306	EA055: Moisture Content	----	0.1	%	29.0	25.2	14.2	0% - 20%
EA055: Moisture Content (Dried @ 105-110°C) (QC Lot: 4931506)									
ET2301429-065	0229_SD134_230308	EA055: Moisture Content	----	0.1	%	56.6	56.0	1.1	0% - 20%
ET2301429-106	0229_SD203_230308	EA055: Moisture Content	----	0.1	%	36.9	36.8	0.3	0% - 20%
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 4931497)									
ET2301427-001	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	0.0010	0.0009	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
ET2301429-028	0229_SD135_230306	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	0.0012	0.0012	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	0.0014	0.0015	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: 4931505)									
ET2301429-065	0229_SD134_230308	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



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: 4931505) - continued									
ET2301429-065	0229_SD134_230308	EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	0.0012	0.0010	18.4	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
ET2301429-106	0229_SD203_230308	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	0.0012	0.0012	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	0.0084	0.0099	16.1	0% - 20%
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	0.0002	0.0003	0.0	No Limit
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 4931497)									
ET2301427-001	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
		ET2301429-028	0229_SD135_230306	EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	<0.0002
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4			0.0002	mg/kg	0.0003	0.0003	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: 4931505)									
ET2301429-065	0229_SD134_230308	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: 4931505) - continued									
ET2301429-065	0229_SD134_230308	EP231X: Perfluorotridecanoic acid (PFTTrDA)	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
ET2301429-106	0229_SD203_230308	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 (PFTTrDA)	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: 4931497)									
ET2301427-001	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
ET2301429-028	0229_SD135_230306	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



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: 4931505)									
ET2301429-065	0229_SD134_230308	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
ET2301429-106	0229_SD203_230308	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: 4931497)									
ET2301427-001	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
ET2301429-028	0229_SD135_230306	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



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: 4931497) - continued									
ET2301429-028	0229_SD135_230306	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: 4931505)									
ET2301429-065	0229_SD134_230308	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
ET2301429-106	0229_SD203_230308	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: **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: 4934746)									
ET2301429-001	0229_MW220S_230307	EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	0.68	0.70	2.1	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	0.20	0.19	7.7	0% - 50%
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	0.13	0.13	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
ET2301429-011	0229_SW233_230306	EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	0.81	0.84	4.0	0% - 20%
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	1.12	1.14	1.0	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	0.10	0.10	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	0.05	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: 4934747)									
ET2301429-035	0229_MW119_230307	EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	0.06	0.06	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	0.04	0.04	0.0	No Limit
		EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	0.36	0.35	3.5	0% - 50%
		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: 4934747) - continued									
ET2301429-035	0229_MW119_230307	EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
ET2301429-045	0229_MW065_230308	EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	8.87	8.95	0.9	0% - 20%
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	12.9	12.4	4.5	0% - 20%
		EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	0.52	0.52	0.0	0% - 20%
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	0.59	0.59	0.0	0% - 20%
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	0.51	0.51	0.0	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: 4934748)									
ET2301429-055	0229_QC154_230308	EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	0.76	0.69	9.6	0% - 20%
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	1.98	1.85	6.6	0% - 20%
		EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	0.16	0.14	12.8	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	0.11	0.09	16.7	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	0.06	0.06	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
ET2301429-072	0229_MW232_230309	EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	0.12	0.11	0.0	0% - 50%
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	0.13	0.13	0.0	0% - 50%
		EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	0.17	0.16	7.6	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: 4934749)									
ET2301429-081	0229_MW101_230309	EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	0.15	0.15	0.0	0% - 50%
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	0.20	0.22	11.0	0% - 20%
		EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	0.16	0.20	23.3	0% - 50%
		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	<0.02	<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
ET2301429-093	0229_MW106_230309	EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	0.35	0.29	18.6	0% - 20%
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	0.18	0.15	16.9	0% - 50%
		EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	0.14	0.12	11.7	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	0.04	0.03	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 4934751)									
EB2307616-005	Anonymous	EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	0.05	0.05	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	0.08	0.07	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



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: 4934751) - continued									
ET2301427-003	Anonymous	EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	0.05	0.05	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	0.04	0.04	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: 4934746)									
ET2301429-001	0229_MW220S_230307	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
ET2301429-011	0229_SW233_230306	EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	0.06	0.06	0.0	No Limit
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	0.03	0.04	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	0.20	0.20	0.0	0% - 50%
		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
ET2301429-035	0229_MW119_230307	EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	0.13	0.13	0.0	0% - 50%
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	0.20	0.19	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	0.19	0.19	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	0.15	0.15	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
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 4934747)									



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: 4934747) - continued											
ET2301429-035	0229_MW119_230307	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	<0.1	0.0	No Limit		
ET2301429-045	0229_MW065_230308	EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	0.30	0.30	0.0	0% - 20%		
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	0.35	0.37	3.2	0% - 50%		
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	2.13	2.10	1.3	0% - 20%		
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	0.14	0.15	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 (PFTTrDA)	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	0.2	0.2	0.0	No Limit				
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 4934748)											
ET2301429-055	0229_QC154_230308	EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	0.05	0.05	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	0.10	0.08	14.4	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 (PFTTrDA)	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		
		ET2301429-072	0229_MW232_230309	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 (PFTTrDA)	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: 4934749)											
ET2301429-081	0229_MW101_230309	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: 4934749) - continued											
ET2301429-081	0229_MW101_230309	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		
ET2301429-093	0229_MW106_230309	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	0.07	0.06	23.7	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: 4934751)									
		EB2307616-005	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		
ET2301427-003	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		



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: 4934751) - continued									
ET2301427-003	Anonymous	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	<0.1	0.0	No Limit
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 4934746)									
ET2301429-001	0229_MW220S_230307	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
ET2301429-011	0229_SW233_230306	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: 4934747)									
ET2301429-035	0229_MW119_230307	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



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: 4934747) - continued									
ET2301429-035	0229_MW119_230307	EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
ET2301429-045	0229_MW065_230308	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: 4934748)									
ET2301429-055	0229_QC154_230308	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
ET2301429-072	0229_MW232_230309	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



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: 4934748) - continued									
ET2301429-072	0229_MW232_230309	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: 4934749)									
ET2301429-081	0229_MW101_230309	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
ET2301429-093	0229_MW106_230309	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: 4934751)									
EB2307616-005	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



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: 4934751) - continued									
EB2307616-005	Anonymous	EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
ET2301427-003	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: 4934746)									
ET2301429-001	0229_MW220S_230307	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
ET2301429-011	0229_SW233_230306	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: 4934747)									
ET2301429-035	0229_MW119_230307	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: 4934747) - continued									
ET2301429-045	0229_MW065_230308	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: 4934748)									
ET2301429-055	0229_QC154_230308	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
ET2301429-072	0229_MW232_230309	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: 4934749)									
ET2301429-081	0229_MW101_230309	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
ET2301429-093	0229_MW106_230309	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: 4934749) - continued									
ET2301429-093	0229_MW106_230309	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: 4934751)									
EB2307616-005	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
ET2301427-003	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
EP231P: PFAS Sums (QC Lot: 4934746)									
ET2301429-001	0229_MW220S_230307	EP231X: Sum of PFAS	----	0.01	µg/L	1.03	1.04	1.0	0% - 20%
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	0.70	0.72	2.8	0% - 20%
		EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	0.90	0.91	1.1	0% - 20%
ET2301429-011	0229_SW233_230306	EP231X: Sum of PFAS	----	0.01	µg/L	2.53	2.59	2.3	0% - 20%
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	1.93	1.98	2.6	0% - 20%
		EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	2.38	2.44	2.5	0% - 20%
EP231P: PFAS Sums (QC Lot: 4934747)									
ET2301429-035	0229_MW119_230307	EP231X: Sum of PFAS	----	0.01	µg/L	1.13	1.11	1.8	0% - 20%
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	0.10	0.10	0.0	0% - 50%
		EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	1.13	1.11	1.8	0% - 20%
ET2301429-045	0229_MW065_230308	EP231X: Sum of PFAS	----	0.01	µg/L	26.5	26.1	1.6	0% - 20%
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	21.8	21.4	1.9	0% - 20%
		EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	25.4	25.0	1.7	0% - 20%
EP231P: PFAS Sums (QC Lot: 4934748)									
ET2301429-055	0229_QC154_230308	EP231X: Sum of PFAS	----	0.01	µg/L	3.22	2.96	8.4	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 (%)
EP231P: PFAS Sums (QC Lot: 4934748) - continued									
ET2301429-055	0229_QC154_230308	EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	2.74	2.54	7.6	0% - 20%
		EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	3.05	2.81	8.2	0% - 20%
ET2301429-072	0229_MW232_230309	EP231X: Sum of PFAS	----	0.01	µg/L	0.42	0.40	4.9	0% - 20%
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	0.25	0.24	4.1	0% - 20%
		EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	0.42	0.40	4.9	0% - 20%
EP231P: PFAS Sums (QC Lot: 4934749)									
ET2301429-081	0229_MW101_230309	EP231X: Sum of PFAS	----	0.01	µg/L	0.56	0.62	10.2	0% - 20%
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	0.35	0.37	5.6	0% - 20%
		EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	0.53	0.59	10.7	0% - 20%
ET2301429-093	0229_MW106_230309	EP231X: Sum of PFAS	----	0.01	µg/L	0.79	0.65	19.4	0% - 20%
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	0.53	0.44	18.6	0% - 20%
		EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	0.75	0.62	19.0	0% - 20%
EP231P: PFAS Sums (QC Lot: 4934751)									
EB2307616-005	Anonymous	EP231X: Sum of PFAS	----	0.01	µg/L	0.15	0.14	6.9	0% - 50%
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	0.13	0.12	8.0	0% - 50%
		EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	0.15	0.14	6.9	0% - 50%
ET2301427-003	Anonymous	EP231X: Sum of PFAS	----	0.01	µg/L	0.11	0.11	0.0	0% - 50%
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	0.09	0.09	0.0	No Limit
		EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	0.11	0.11	0.0	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: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report				
				Result	Spike Concentration	Spike Recovery (%)		Acceptable Limits (%)	
						LCS	Low	High	
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4931497)									
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	0.0011 mg/kg	104	72.0	128	
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	0.00117 mg/kg	102	73.0	123	
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	0.00118 mg/kg	106	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	100	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	
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4931505)									
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	0.0011 mg/kg	111	72.0	128	
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	0.00117 mg/kg	106	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	114	70.0	132	
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	0.00116 mg/kg	98.3	68.0	136	
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	0.0012 mg/kg	105	59.0	134	
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4931497)									
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	0.00625 mg/kg	94.2	71.0	135	
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	0.00125 mg/kg	88.0	69.0	132	
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	0.00125 mg/kg	92.4	70.0	132	
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	0.00125 mg/kg	89.6	71.0	131	
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	96.8	69.0	133	
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	99.2	72.0	129	
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	0.00125 mg/kg	94.8	69.0	133	
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	94.8	64.0	136	
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	95.6	69.0	135	
EP231X: Perfluorotridecanoic acid (PFTTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	93.2	66.0	139	
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	0.00312 mg/kg	94.4	69.0	133	
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4931505)									
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	0.00625 mg/kg	99.2	71.0	135	
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	0.00125 mg/kg	103	69.0	132	
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	0.00125 mg/kg	102	70.0	132	
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	0.00125 mg/kg	104	71.0	131	
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	106	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	112	69.0	133	
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	104	64.0	136	



Sub-Matrix: **SOIL**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report Result	Laboratory Control Spike (LCS) Report				
					Spike Concentration	Spike Recovery (%)		Acceptable Limits (%)	
						LCS	Low	High	High
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4931505) - continued									
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	100	66.0	139	
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	0.00312 mg/kg	100	69.0	133	
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4931497)									
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	0.00125 mg/kg	88.4	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	111	62.8	140	
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	0.00312 mg/kg	102	61.5	139	
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	0.00312 mg/kg	108	61.9	137	
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	0.00125 mg/kg	98.0	63.0	144	
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	0.00125 mg/kg	93.2	61.0	139	
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4931505)									
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	0.00125 mg/kg	106	67.0	137	
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	0.00312 mg/kg	111	59.6	143	
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	0.00312 mg/kg	97.4	62.8	140	
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	0.00312 mg/kg	115	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	137	
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	0.00125 mg/kg	97.2	63.0	144	
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	0.00125 mg/kg	94.0	61.0	139	
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4931497)									
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	0.00117 mg/kg	104	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	102	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	97.9	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	99.2	54.8	124	
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4931505)									
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	115	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	122	54.8	124	

Sub-Matrix: **WATER**

Method Blank (MB) Report	Laboratory Control Spike (LCS) Report		
	Spike	Spike Recovery (%)	Acceptable Limits (%)



Sub-Matrix: WATER

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report				
				Result	Spike Concentration	Spike Recovery (%)		Acceptable Limits (%)	
						LCS	Low	High	
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4934746)									
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.2218 µg/L	117	72.0	130	
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.2352 µg/L	110	71.0	127	
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	0.2373 µg/L	107	68.0	131	
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.238 µg/L	114	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	103	53.0	142	
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4934747)									
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.2218 µg/L	130	72.0	130	
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.2352 µg/L	116	71.0	127	
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	0.2373 µg/L	108	68.0	131	
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.238 µg/L	123	69.0	134	
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.232 µg/L	114	65.0	140	
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.241 µg/L	110	53.0	142	
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4934748)									
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.2218 µg/L	114	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	102	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	105	65.0	140	
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.241 µg/L	104	53.0	142	
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4934749)									
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.2218 µg/L	109	72.0	130	
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.2352 µg/L	112	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	108	69.0	134	
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.232 µg/L	105	65.0	140	
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.241 µg/L	107	53.0	142	
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4934751)									
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	90.3	71.0	127	
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	0.2373 µg/L	96.3	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	92.4	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: 4934746)									
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	110	72.0	129	
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	0.25 µg/L	109	72.0	129	



Sub-Matrix: WATER

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report				
				Result	Spike	Spike Recovery (%)		Acceptable Limits (%)	
					Concentration	LCS	Low	High	
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4934746) - continued									
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	0.25 µg/L	99.6	72.0	130	
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	0.25 µg/L	103	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	103	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	99.0	72.0	134	
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	0.25 µg/L	98.6	65.0	144	
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	0.625 µg/L	110	71.0	132	
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4934747)									
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	1.25 µg/L	117	73.0	129	
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	0.25 µg/L	112	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	109	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	111	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	107	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	102	65.0	144	
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	0.625 µg/L	119	71.0	132	
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4934748)									
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	115	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	110	72.0	130	
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	0.25 µg/L	101	71.0	133	
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	0.25 µg/L	110	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	105	69.0	133	
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	0.25 µg/L	93.8	72.0	134	
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	0.25 µg/L	89.6	65.0	144	
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	0.625 µg/L	116	71.0	132	
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4934749)									
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	1.25 µg/L	108	73.0	129	
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	0.25 µg/L	113	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	103	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	



Sub-Matrix: WATER

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report Result	Laboratory Control Spike (LCS) Report				
					Spike Concentration	Spike Recovery (%)		Acceptable Limits (%)	
						LCS	Low	High	High
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4934749) - continued									
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	0.25 µg/L	119	69.0	130	
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	0.25 µg/L	96.2	71.0	129	
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	0.25 µg/L	108	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	90.0	65.0	144	
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	0.625 µg/L	110	71.0	132	
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4934751)									
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	1.25 µg/L	114	73.0	129	
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	0.25 µg/L	96.8	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	86.2	72.0	130	
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	0.25 µg/L	88.6	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	91.4	71.0	129	
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	0.25 µg/L	90.6	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	93.0	65.0	144	
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	0.625 µg/L	110	71.0	132	
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4934746)									
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.25 µg/L	109	67.0	137	
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	0.625 µg/L	139	68.0	141	
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	0.625 µg/L	104	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	62.6	138	
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	0.25 µg/L	98.2	65.0	136	
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	0.25 µg/L	92.2	61.0	135	
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4934747)									
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.25 µg/L	112	67.0	137	
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	0.625 µg/L	112	68.0	141	
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	0.625 µg/L	109	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	109	62.6	138	



Sub-Matrix: WATER

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report				
				Result	Spike Concentration	Spike Recovery (%)		Acceptable Limits (%)	
						LCS	Low	High	
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4934747) - continued									
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	111	61.0	135	
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4934748)									
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	116	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	112	68.3	134	
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	0.625 µg/L	84.6	62.6	138	
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	0.25 µg/L	105	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: 4934749)									
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.25 µg/L	99.4	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	85.7	60.5	138	
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	0.625 µg/L	92.0	68.3	134	
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	0.625 µg/L	68.8	62.6	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	
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4934751)									
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.25 µg/L	111	67.0	137	
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	0.625 µg/L	128	68.0	141	
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	0.625 µg/L	109	60.5	138	
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	0.625 µg/L	86.5	68.3	134	
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	0.625 µg/L	99.0	62.6	138	
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	0.25 µg/L	113	65.0	136	



Sub-Matrix: WATER

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report				
				Result	Spike	Spike Recovery (%)		Acceptable Limits (%)	
					Concentration	LCS	Low	High	
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4934751) - continued									
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: 4934746)									
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	125	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	91.9	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	97.3	64.2	133	
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4934747)									
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.2343 µg/L	119	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	125	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	96.7	64.2	133	
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4934748)									
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.2343 µg/L	105	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	122	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	106	64.2	133	
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4934749)									
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	114	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	123	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	126	64.2	133	
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4934751)									
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	114	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	117	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	116	64.2	133	
EP231P: PFAS Sums (QCLot: 4934746)									
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: 4934747)									
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: 4934748)									



Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report Result	Laboratory Control Spike (LCS) Report				
					Spike Concentration	Spike Recovery (%)		Acceptable Limits (%)	
						LCS	Low	High	High
EP231P: PFAS Sums (QCLot: 4934748) - continued									
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: 4934749)									
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: 4934751)									
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: **SOIL**

Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report			
				Spike Concentration	Spike Recovery(%) MS	Acceptable Limits (%)	
						Low	High
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4931497)							
ET2301427-002	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	112	73.0	123
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.00118 mg/kg	117	67.0	130
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.00119 mg/kg	124	70.0	132
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.00116 mg/kg	120	68.0	136
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0012 mg/kg	119	59.0	134
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4931505)							
ET2301429-066	0229_SD244_230308	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0011 mg/kg	122	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	116	67.0	130
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.00119 mg/kg	127	70.0	132
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.00116 mg/kg	110	68.0	136
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0012 mg/kg	92.5	59.0	134
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4931497)							
ET2301427-002	Anonymous	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.00625 mg/kg	109	71.0	135



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: 4931497) - continued							
ET2301427-002	Anonymous	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	97.2	70.0	132
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.00125 mg/kg	99.2	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	104	72.0	129
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.00125 mg/kg	102	69.0	133
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.00125 mg/kg	100	64.0	136
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.00125 mg/kg	107	69.0	135
		EP231X: Perfluorotridecanoic acid (PFTTrDA)	72629-94-8	0.00125 mg/kg	104	66.0	139
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.00312 mg/kg	106	69.0	133
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4931505)							
ET2301429-066	0229_SD244_230308	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.00625 mg/kg	114	71.0	135
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.00125 mg/kg	113	69.0	132
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.00125 mg/kg	114	70.0	132
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.00125 mg/kg	114	71.0	131
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.00125 mg/kg	118	69.0	133
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.00125 mg/kg	129	72.0	129
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.00125 mg/kg	112	69.0	133
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.00125 mg/kg	114	64.0	136
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.00125 mg/kg	115	69.0	135
		EP231X: Perfluorotridecanoic acid (PFTTrDA)	72629-94-8	0.00125 mg/kg	106	66.0	139
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.00312 mg/kg	112	69.0	133
		EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4931497)					
ET2301427-002	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.00125 mg/kg	102	48.0	128
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.00312 mg/kg	106	70.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.00312 mg/kg	128	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.00312 mg/kg	100	70.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.00312 mg/kg	116	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.00125 mg/kg	107	63.0	144
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.00125 mg/kg	117	61.0	139
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4931505)							
ET2301429-066	0229_SD244_230308	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.00125 mg/kg	118	48.0	128
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.00312 mg/kg	121	70.0	130



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: 4931505) - continued							
ET2301429-066	0229_SD244_230308	EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.00312 mg/kg	106	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.00312 mg/kg	118	70.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.00312 mg/kg	123	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.00125 mg/kg	112	63.0	144
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.00125 mg/kg	107	61.0	139
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4931497)							
ET2301427-002	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.00117 mg/kg	103	62.0	145
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.00118 mg/kg	118	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0012 mg/kg	80.8	65.0	137
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0012 mg/kg	87.1	70.0	130
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4931505)							
ET2301429-066	0229_SD244_230308	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.00117 mg/kg	129	62.0	145
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.00118 mg/kg	119	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0012 mg/kg	114	65.0	137
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0012 mg/kg	112	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
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4934746)							
ET2301429-002	0229_MW233_230307	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.2218 µg/L	112	72.0	130
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.235 µg/L	87.7	71.0	127
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.2352 µg/L	94.4	68.0	131
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.238 µg/L	107	69.0	134
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.232 µg/L	95.7	65.0	140
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.241 µg/L	98.3	53.0	142
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4934747)							
ET2301429-036	0229_MW1251_230308	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.2218 µg/L	120	72.0	130
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.235 µg/L	97.8	71.0	127
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.2352 µg/L	96.4	68.0	131
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.238 µg/L	112	69.0	134
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.232 µg/L	103	65.0	140
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.241 µg/L	108	53.0	142
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4934748)							



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: 4934748) - continued							
ET2301429-057	0229_QC301_230307	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.2218 µg/L	109	72.0	130
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.235 µg/L	114	71.0	127
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.2352 µg/L	100.0	68.0	131
		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	101	65.0	140
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.241 µg/L	102	53.0	142
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4934749)							
ET2301429-082	0229_MW114_230309	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.2218 µg/L	107	72.0	130
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.235 µg/L	126	71.0	127
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.2352 µg/L	# Not Determined	68.0	131
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.238 µg/L	123	69.0	134
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.232 µg/L	118	65.0	140
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.241 µg/L	128	53.0	142
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4934751)							
EB2307616-009	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.2218 µg/L	106	72.0	130
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.235 µg/L	97.5	71.0	127
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.2352 µg/L	117	68.0	131
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.238 µg/L	117	69.0	134
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.232 µg/L	123	65.0	140
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.241 µg/L	115	53.0	142
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4934746)							
ET2301429-002	0229_MW233_230307	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	1.25 µg/L	103	73.0	129
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.25 µg/L	103	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	96.7	72.0	130
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.25 µg/L	96.8	71.0	133
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.25 µg/L	92.6	69.0	130
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.25 µg/L	96.2	71.0	129
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.25 µg/L	98.5	69.0	133
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.25 µg/L	92.2	72.0	134
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.25 µg/L	90.5	65.0	144
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.625 µg/L	111	71.0	132
		EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4934747)					
ET2301429-036	0229_MW1251_230308	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	1.25 µg/L	106	73.0	129
		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	105	72.0	129
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.25 µg/L	100	72.0	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: 4934747) - continued									
ET2301429-036	0229_MW1251_230308	EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.25 µg/L	103	71.0	133		
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.25 µg/L	104	69.0	130		
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.25 µg/L	96.6	71.0	129		
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.25 µg/L	104	69.0	133		
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.25 µg/L	89.4	72.0	134		
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.25 µg/L	91.2	65.0	144		
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.625 µg/L	113	71.0	132		
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4934748)									
ET2301429-057	0229_QC301_230307	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	1.25 µg/L	108	73.0	129		
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.25 µg/L	111	72.0	129		
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.25 µg/L	107	72.0	129		
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.25 µg/L	107	72.0	130		
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.25 µg/L	97.6	71.0	133		
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.25 µg/L	112	69.0	130		
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.25 µg/L	95.0	71.0	129		
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.25 µg/L	105	69.0	133		
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.25 µg/L	93.4	72.0	134		
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.25 µg/L	84.2	65.0	144		
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.625 µg/L	111	71.0	132		
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4934749)									
ET2301429-082	0229_MW114_230309	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	1.25 µg/L	126	73.0	129		
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.25 µg/L	116	72.0	129		
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.25 µg/L	# Not Determined	72.0	129		
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.25 µg/L	123	72.0	130		
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.25 µg/L	123	71.0	133		
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.25 µg/L	127	69.0	130		
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.25 µg/L	118	71.0	129		
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.25 µg/L	125	69.0	133		
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.25 µg/L	119	72.0	134		
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.25 µg/L	119	65.0	144		
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.625 µg/L	130	71.0	132		
		EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4934751)							
		EB2307616-009	Anonymous	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	1.25 µg/L	129	73.0	129
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3			0.25 µg/L	116	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	97.4	72.0	130		
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1			0.25 µg/L	97.4	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: 4934751) - continued							
EB2307616-009	Anonymous	EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.25 µg/L	121	69.0	130
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.25 µg/L	106	71.0	129
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.25 µg/L	105	69.0	133
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.25 µg/L	110	72.0	134
		EP231X: Perfluorotridecanoic acid (PFTTrDA)	72629-94-8	0.25 µg/L	102	65.0	144
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.625 µg/L	123	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4934746)							
ET2301429-002	0229_MW233_230307	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.25 µg/L	95.6	59.0	135
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.625 µg/L	123	70.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.625 µg/L	100	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.625 µg/L	92.2	70.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.625 µg/L	101	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	101	61.0	135
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4934747)							
ET2301429-036	0229_MW1251_230308	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.25 µg/L	102	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	100	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.625 µg/L	104	70.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.625 µg/L	99.8	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.25 µg/L	114	65.0	136
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.25 µg/L	108	61.0	135
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4934748)							
ET2301429-057	0229_QC301_230307	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.25 µg/L	104	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	92.5	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.625 µg/L	99.4	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: 4934748) - continued							
ET2301429-057	0229_QC301_230307	EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.625 µg/L	76.6	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.25 µg/L	93.9	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: 4934749)							
ET2301429-082	0229_MW114_230309	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.25 µg/L	122	59.0	135
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.625 µg/L	127	70.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.625 µg/L	120	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.625 µg/L	127	70.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.625 µg/L	73.7	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.25 µg/L	132	65.0	136
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.25 µg/L	126	61.0	135
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4934751)							
EB2307616-009	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.25 µg/L	121	59.0	135
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.625 µg/L	129	70.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.625 µg/L	117	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.625 µg/L	94.2	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	119	65.0	136
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.25 µg/L	120	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4934746)							
ET2301429-002	0229_MW233_230307	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.234 µg/L	95.9	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	95.6	67.0	138
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.2415 µg/L	102	70.0	130
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4934747)							
ET2301429-036	0229_MW1251_230308	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.234 µg/L	98.9	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: 4934747) - continued							
ET2301429-036	0229_MW125I_230308	EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.2378 µg/L	102	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	103	70.0	130
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4934748)							
ET2301429-057	0229_QC301_230307	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.234 µg/L	98.3	63.0	143
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.2378 µg/L	112	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.24 µg/L	115	67.0	138
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.2415 µg/L	109	70.0	130
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4934749)							
ET2301429-082	0229_MW114_230309	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.234 µg/L	127	63.0	143
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.2378 µg/L	127	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.24 µg/L	124	67.0	138
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.2415 µg/L	122	70.0	130
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4934751)							
EB2307616-009	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.234 µg/L	118	63.0	143
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.2378 µg/L	138	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.24 µg/L	118	67.0	138
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.2415 µg/L	116	70.0	130



SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : ET2301429

Client	:	[REDACTED]	Laboratory	:	[REDACTED]
Contact	:	[REDACTED]	Contact	:	[REDACTED]
Address	:	[REDACTED]	Address	:	[REDACTED] QLD Australia 4815
E-mail	:	[REDACTED]	E-mail	:	[REDACTED]
Telephone	:	----	Telephone	:	+61 7 3552 8616
Facsimile	:	----	Facsimile	:	
Project	:	QLD_0229_PFASOMP_23	Page	:	1 of 5
Order number	:	60612487 task 3.1	Quote number	:	ET2021AECOMAU0001 (TV/007/21 v2 - Compass)
C-O-C number	:	49308	QC Level	:	NEPM 2013 B3 & ALS QC Standard
Site	:	QLD_0229			
Sampler	:	[REDACTED]			

Dates

Date Samples Received	:	14-Mar-2023 09:15	Issue Date	:	21-Mar-2023
Client Requested Due Date	:	28-Mar-2023	Scheduled Reporting Date	:	28-Mar-2023

Delivery Details

Mode of Delivery	:	Carrier	Security Seal	:	Intact.
No. of coolers/boxes	:	4	Temperature	:	4.8°C, 3.0°C, 3.2°C, 3.1°C. - Ice present
Receipt Detail	:	MEDIUM ESKY	No. of samples received / analysed	:	109 / 107

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 be advised, Extra PFAS Soil container received labelled "0229_SD233_230306" has been added to this work order (ALS #110). ALS has assigned analysis as per other the other soil samples in this Workorder. If this is incorrect or for more information, please contact Client Services at ALSEnviro.Brisbane@alsglobal.com.**
- *SRN Reissued 21/03/2023: as per the email received from [REDACTED] (17/03/2023), the results for ET2301429-086 & 110 will not be reported on the COA.
- *Samples were originally received by ALS Townsville on 14/03/2023 and have been forwarded to ALS Brisbane for analysis. Temperature on arrival in ALS Brisbane has been noted above.
- **Please be advised that sample "0229_QC104_230309" (ALS # 84) was not received at the laboratory (denoted SNR on the scanned COC). ALS has removed this sample from the workorder. This sample appears to be a duplicate of sample "0229_QC104_230309" (ALS #86).**
- Discounted Package Prices apply only when specific ALS Group Codes ('W', 'S', 'NT' suites) are referenced on COCs.
- Please direct any turn around / technical queries to the laboratory contact designated above.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months ± 1 week) from receipt of samples.
- All analysis will be conducted by ALS Environmental, Brisbane, NATA accreditation no. 825, Site No. 818.
- 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.
- **Please refer to the Proactive Holding Time Report table below which summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory. The laboratory will process these samples unless instructions are received from you indicating you do not wish to proceed. The absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.**



Sample 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.

ET2301429-004 : 06-Mar-2023 15:38 : 0229_SW132_230306 - Surface water

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)
ET2301429-020	06-Mar-2023 11:40	0229_SD121_230306	✓	✓
ET2301429-021	06-Mar-2023 11:23	0229_SD136_230306	✓	✓
ET2301429-022	06-Mar-2023 14:10	0229_SD110_230306	✓	✓
ET2301429-023	06-Mar-2023 12:20	0229_SD120_230306	✓	✓
ET2301429-024	06-Mar-2023 13:15	0229_SD133_230306	✓	✓
ET2301429-025	06-Mar-2023 14:40	0229_SD140_230306	✓	✓
ET2301429-026	06-Mar-2023 14:15	0229_SD139_230306	✓	✓
ET2301429-027	06-Mar-2023 11:23	0229_QC151_230306	✓	✓
ET2301429-028	06-Mar-2023 12:05	0229_SD135_230306	✓	✓
ET2301429-029	06-Mar-2023 13:37	0229_SD109_230306	✓	✓
ET2301429-030	06-Mar-2023 15:00	0229_SD217_230306	✓	✓
ET2301429-031	06-Mar-2023 13:30	0229_SD129_230306	✓	✓
ET2301429-032	06-Mar-2023 13:30	0229_QC153_230306	✓	✓
ET2301429-033	06-Mar-2023 13:15	0229_SD132_230306	✓	✓
ET2301429-034	06-Mar-2023 16:10	0229_SD128_230306	✓	✓
ET2301429-062	08-Mar-2023 09:48	0229_SD130_230308	✓	✓
ET2301429-063	08-Mar-2023 10:05	0229_SD126_230308	✓	✓
ET2301429-064	08-Mar-2023 12:10	0229_SD227_230308	✓	✓
ET2301429-065	08-Mar-2023 09:30	0229_SD134_230308	✓	✓
ET2301429-066	08-Mar-2023 11:10	0229_SD244_230308	✓	✓
ET2301429-067	09-Mar-2023 16:24	0229_SD232_230309	✓	✓
ET2301429-068	09-Mar-2023 09:00	0229_SD220_230309	✓	✓
ET2301429-069	09-Mar-2023 09:30	0229_SD242_230309	✓	✓
ET2301429-070	09-Mar-2023 12:00	0229_SD205_230309	✓	✓
ET2301429-089	09-Mar-2023 10:50	0229_SD243_230309	✓	✓
ET2301429-102	10-Mar-2023 15:20	0229_SD144_230310	✓	✓
ET2301429-103	10-Mar-2023 14:50	0229_SD113_230310	✓	✓
ET2301429-104	10-Mar-2023 13:15	0229_SD119_230310	✓	✓
ET2301429-106	08-Mar-2023 16:50	0229_SD203_230308	✓	✓
ET2301429-107	08-Mar-2023 09:55	0229_SD245_230308	✓	✓
ET2301429-108	06-Mar-2023 15:00	0229_QC105_230306	✓	✓
ET2301429-110	06-Mar-2023 15:50	0229_SD233_230306	✓	✓



Matrix: **WATER**

Laboratory sample ID	Sampling date / time	Sample ID	WATER - EP231X PFAS - Full Suite (28 analytes)
ET2301429-001	07-Mar-2023 13:09	0229_MW220S_230307	✓
ET2301429-002	07-Mar-2023 14:01	0229_MW233_230307	✓
ET2301429-003	07-Mar-2023 14:16	0229_MW212_230307	✓
ET2301429-004	06-Mar-2023 15:38	0229_SW132_230306 S...	✓
ET2301429-005	06-Mar-2023 14:45	0229_SW140_230306	✓
ET2301429-006	06-Mar-2023 13:17	0229_SW133_230306	✓
ET2301429-007	06-Mar-2023 11:23	0229_SW136_230306	✓
ET2301429-008	06-Mar-2023 13:40	0229_SW109_230306	✓
ET2301429-009	06-Mar-2023 14:16	0229_SW139_230306	✓
ET2301429-010	06-Mar-2023 15:00	0229_SW217_230306	✓
ET2301429-011	06-Mar-2023 15:48	0229_SW233_230306	✓
ET2301429-012	06-Mar-2023 12:00	0229_SW135_230306	✓
ET2301429-013	06-Mar-2023 04:10	0229_SW128_230306	✓
ET2301429-014	06-Mar-2023 16:30	0229_SW203_230306	✓
ET2301429-015	06-Mar-2023 11:23	0229_QC150_230306	✓
ET2301429-016	06-Mar-2023 16:20	0229_QC350_230306	✓
ET2301429-017	06-Mar-2023 15:00	0229_QC100_230306	✓
ET2301429-018	06-Mar-2023 13:30	0229_QC152_230306	✓
ET2301429-019	06-Mar-2023 13:30	0229_SW129_230306	✓
ET2301429-035	07-Mar-2023 16:40	0229_MW119_230307	✓
ET2301429-036	08-Mar-2023 23:00	0229_MW125L_230308	✓
ET2301429-037	08-Mar-2023 14:55	0229_MW115_230308	✓
ET2301429-038	08-Mar-2023 15:10	0229_MW205S_230308	✓
ET2301429-039	08-Mar-2023 10:45	0229_MW125S_230308	✓
ET2301429-040	08-Mar-2023 14:34	0229_MW002_230308	✓
ET2301429-041	08-Mar-2023 16:00	0229_MW235S_230308	✓
ET2301429-042	08-Mar-2023 14:30	0229_MW217_230308	✓
ET2301429-043	08-Mar-2023 15:48	0229_SW126_230308	✓
ET2301429-044	08-Mar-2023 12:00	0229_MW003_230308	✓
ET2301429-045	08-Mar-2023 15:00	0229_MW065_230308	✓
ET2301429-046	08-Mar-2023 12:50	0229_MW122_230308	✓
ET2301429-047	08-Mar-2023 09:30	0229_SW134_230308	✓
ET2301429-048	08-Mar-2023 12:05	0229_SW227_230308	✓
ET2301429-049	08-Mar-2023 12:30	0229_MW123S_230308	✓
ET2301429-050	08-Mar-2023 14:11	0229_MW120_230308	✓
ET2301429-051	08-Mar-2023 23:15	0229_SW244_230308	✓
ET2301429-052	08-Mar-2023 11:45	0229_MW124_230308	✓
ET2301429-053	08-Mar-2023 17:00	0229_QC302_230308	✓
ET2301429-054	08-Mar-2023 16:00	0229_QC101_230308	✓
ET2301429-055	08-Mar-2023 14:00	0229_QC154_230308	✓
ET2301429-056	08-Mar-2023 13:40	0229_MW121_230308	✓



				WATER - EP231X PFAS - Full Suite (28 analytes)
ET2301429-057	07-Mar-2023 16:00	0229_QC301_230307	✓	
ET2301429-058	08-Mar-2023 15:50	0229_MW236S_230308	✓	
ET2301429-059	08-Mar-2023 21:50	0229_SW130_230308	✓	
ET2301429-060	08-Mar-2023 17:00	0229_QC303_230308	✓	
ET2301429-061	08-Mar-2023 12:15	0229_MW123I_230308	✓	
ET2301429-071	09-Mar-2023 09:50	0229_SW232_230309	✓	
ET2301429-072	09-Mar-2023 10:05	0229_MW232_230309	✓	
ET2301429-073	09-Mar-2023 09:30	0229_MW138_230309	✓	
ET2301429-074	09-Mar-2023 11:50	0229_MW118_230309	✓	
ET2301429-075	09-Mar-2023 10:56	0229_MW105_230309	✓	
ET2301429-076	09-Mar-2023 12:00	0229_SW205_230309	✓	
ET2301429-077	09-Mar-2023 11:50	0229_QC103_230309	✓	
ET2301429-078	09-Mar-2023 10:30	0229_QC102_230309	✓	
ET2301429-079	09-Mar-2023 09:25	0229_SW242_230309	✓	
ET2301429-080	08-Mar-2023 17:10	0229_QC353_230308	✓	
ET2301429-081	09-Mar-2023 09:49	0229_MW101_230309	✓	
ET2301429-082	09-Mar-2023 11:30	0229_MW114_230309	✓	
ET2301429-083	09-Mar-2023 10:28	0229_MW128_230309	✓	
ET2301429-085	09-Mar-2023 10:00	0229_MW102_230309	✓	
ET2301429-086	09-Mar-2023 10:30	0229_QC104_230309	✓	
ET2301429-087	09-Mar-2023 09:00	0229_SW220_230309	✓	
ET2301429-088	09-Mar-2023 09:30	0229_SW243_230309	✓	
ET2301429-090	09-Mar-2023 14:10	0229_MW131_230309	✓	
ET2301429-091	09-Mar-2023 13:10	0229_MW018_230309	✓	
ET2301429-092	09-Mar-2023 14:20	0229_MW072_230309	✓	
ET2301429-093	09-Mar-2023 13:45	0229_MW106_230309	✓	
ET2301429-094	09-Mar-2023 15:00	0229_MW141_230309	✓	
ET2301429-095	09-Mar-2023 15:45	0229_MW139_230309	✓	
ET2301429-096	09-Mar-2023 14:45	0229_MW074_230309	✓	
ET2301429-097	09-Mar-2023 13:30	0229_MW135_230309	✓	
ET2301429-098	10-Mar-2023 14:50	0229_SW113_230310	✓	
ET2301429-099	10-Mar-2023 13:15	0229_SW119_230310	✓	
ET2301429-100	10-Mar-2023 15:20	0229_SW144_230310	✓	
ET2301429-101	10-Mar-2023 13:50	0229_MW116_230310	✓	
ET2301429-105	08-Mar-2023 09:50	0229_SW245_220308	✓	
ET2301429-109	08-Mar-2023 17:00	0229_QC300_230308	✓	

Proactive Holding Time Report

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



Requested Deliverables

ACCOUNTS PAYABLE

- A4 - AU Tax Invoice (INV)

Email

AP_CustomerService.ANZ@aecom.com

[REDACTED]

- *AU Certificate of Analysis - NATA (COA)
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)
- A4 - AU Tax Invoice (INV)
- Chain of Custody (CoC) (COC)
- EDI Format - ENMRG (ENMRG)
- EDI Format - ESDAT (ESDAT)

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[REDACTED]

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

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DERP ESDAT REPORTS

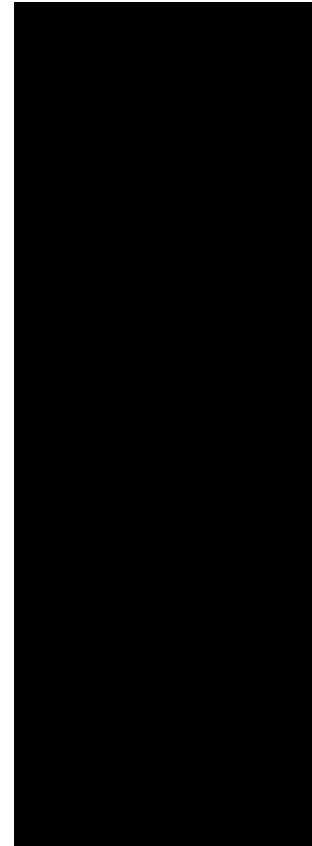
- EDI Format - ESDAT (ESDAT)

Email

[REDACTED]

- *AU Certificate of Analysis - NATA (COA)
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)
- Chain of Custody (CoC) (COC)
- EDI Format - EQUIS V5 AECOM (EQUIS_V5_AECOM)
- EDI Format - ESDAT (ESDAT)

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CERTIFICATE OF ANALYSIS

Work Order : **ET2301455**
Client : [REDACTED]
Contact : [REDACTED]
Address : [REDACTED]

Telephone : [REDACTED]
Project : QLD_0229_PFASOMP_23
Order number : 60612487 task 3.1
C-O-C number : 49674
Sampler : [REDACTED]
Site : QLD_0229
Quote number : TV/007/21 v2 - Compass
No. of samples received : 7
No. of samples analysed : 7

Page : 1 of 7
Laboratory : [REDACTED]
Contact : [REDACTED]
Address : [REDACTED]

Telephone : + [REDACTED]
Date Samples Received : 16-Mar-2023 12:52
Date Analysis Commenced : 17-Mar-2023
Issue Date : 27-Mar-2023 12:12



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.

<i>Signatories</i>	<i>Position</i>	<i>Accreditation Category</i>
[REDACTED]	Senior Inorganic Chemist	Brisbane Inorganics, Stafford, QLD
[REDACTED]	Senior Chemist - Organics	Brisbane Organics, Stafford, QLD



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.
- \$\$ conducted by ALS Townsville, NATA accreditation no. 825, (Site no. 23472 for Chemical Testing and Site no. 23313 for Biological Testing)
- All remaining analysis will be conducted by ALS Environmental, Brisbane, NATA accreditation no. 825, Site No. 818.
- EP231X PFAS: Whole bottle extraction was not possible for samples "0229_SW110_230315" & "0229_QC106_230315". Samples required dilution prior to extraction due to the presence of high level contaminants. LOR values have been adjusted accordingly. The LOR of PFNA for sample "0229_SW110_230315" has been further raised due to matrix interference.
- 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.
- 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, PFTTrDA 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: SOIL (Matrix: SOIL)		Sample ID		0229_SD233_230315	0229_QC107_230315	----	----	----
		Sampling date / time		15-Mar-2023 10:53	15-Mar-2023 10:56	----	----	----
Compound	CAS Number	LOR	Unit	ET2301455-003	ET2301455-007	-----	-----	-----
				Result	Result	----	----	----
EA055: Moisture Content (Dried @ 105-110°C)								
Moisture Content	----	0.1	%	13.0	12.8	----	----	----
EP231A: Perfluoroalkyl Sulfonic Acids								
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	0.0003	0.0006	----	----	----
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	0.0002	0.0004	----	----	----
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	0.0022	0.0028	----	----	----
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	0.0084	0.0074	----	----	----
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	----	----	----
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	<0.0005	----	----	----



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	0229_SD233_230315	0229_QC107_230315	----	----	----
Sampling date / time				15-Mar-2023 10:53	15-Mar-2023 10:56	----	----	----	
Compound	CAS Number	LOR	Unit	ET2301455-003	ET2301455-007	-----	-----	-----	
				Result	Result	----	----	----	
EP231C: Perfluoroalkyl Sulfonamides - Continued									
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	0.0111	0.0112	----	----	----	
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg	0.0106	0.0102	----	----	----	
Sum of PFAS (WA DER List)	----	0.0002	mg/kg	0.0109	0.0108	----	----	----	
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.0002	%	82.5	110	----	----	----	
13C8-PFOA	----	0.0002	%	102	95.0	----	----	----	



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	0229_SW110_230315	0229_QC106_230315	0229_QC360_230315	0229_QC351_230307	0229_QC352_230308
Sampling date / time				15-Mar-2023 10:03	15-Mar-2023 10:04	15-Mar-2023 10:53	07-Mar-2023 18:00	08-Mar-2023 18:00	
Compound	CAS Number	LOR	Unit	ET2301455-001	ET2301455-002	ET2301455-004	ET2301455-005	ET2301455-006	
				Result	Result	Result	Result	Result	
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	4.68	4.43	<0.02	<0.02	<0.02	
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	4.93	4.43	<0.02	<0.02	<0.02	
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	33.3	30.9	<0.01	<0.01	<0.01	
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	2.40	2.14	<0.02	<0.02	<0.02	
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	36.9	37.1	<0.01	<0.01	<0.01	
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.09	<0.10	<0.02	<0.02	<0.02	
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	0.7	0.6	<0.1	<0.1	<0.1	
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	1.91	1.98	<0.02	<0.02	<0.02	
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	9.79	9.77	<0.02	<0.02	<0.02	
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	1.16	1.12	<0.02	<0.02	<0.02	
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	2.67	2.73	<0.01	<0.01	<0.01	
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.12	<0.10	<0.02	<0.02	<0.02	
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.09	<0.10	<0.02	<0.02	<0.02	
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.09	<0.10	<0.02	<0.02	<0.02	
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.09	<0.10	<0.02	<0.02	<0.02	
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.09	<0.10	<0.02	<0.02	<0.02	
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.23	<0.25	<0.05	<0.05	<0.05	
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.09	<0.10	<0.02	<0.02	<0.02	
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.23	<0.25	<0.05	<0.05	<0.05	
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.23	<0.25	<0.05	<0.05	<0.05	



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	0229_SW110_230315	0229_QC106_230315	0229_QC360_230315	0229_QC351_230307	0229_QC352_230308
Sampling date / time				15-Mar-2023 10:03	15-Mar-2023 10:04	15-Mar-2023 10:53	07-Mar-2023 18:00	08-Mar-2023 18:00	
Compound	CAS Number	LOR	Unit	ET2301455-001	ET2301455-002	ET2301455-004	ET2301455-005	ET2301455-006	
				Result	Result	Result	Result	Result	
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.23	<0.25	<0.05	<0.05	<0.05	
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.23	<0.25	<0.05	<0.05	<0.05	
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.09	<0.10	<0.02	<0.02	<0.02	
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.09	<0.10	<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	<0.09	<0.10	<0.05	<0.05	<0.05	
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.09	<0.10	<0.05	<0.05	<0.05	
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.09	<0.10	<0.05	<0.05	<0.05	
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.09	<0.10	<0.05	<0.05	<0.05	
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L	98.4	95.2	<0.01	<0.01	<0.01	
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	70.2	68.0	<0.01	<0.01	<0.01	
Sum of PFAS (WA DER List)	----	0.01	µg/L	91.1	88.6	<0.01	<0.01	<0.01	
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%	92.6	102	96.5	103	99.2	
13C8-PFOA	----	0.02	%	95.1	98.0	97.1	104	99.5	



Surrogate Control Limits

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

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

Inter-Laboratory Testing

Analysis conducted by ALS Brisbane, NATA accreditation no. 825, site no. 818 (Chemistry) 18958 (Biology).

- (WATER) EP231A: Perfluoroalkyl Sulfonic Acids
- (WATER) EP231B: Perfluoroalkyl Carboxylic Acids
- (WATER) EP231C: Perfluoroalkyl Sulfonamides
- (WATER) EP231D: (n:2) Fluorotelomer Sulfonic Acids
- (WATER) EP231P: PFAS Sums
- (WATER) EP231S: PFAS Surrogate
- (SOIL) EP231B: Perfluoroalkyl Carboxylic Acids
- (SOIL) EP231D: (n:2) Fluorotelomer Sulfonic Acids
- (SOIL) EP231C: Perfluoroalkyl Sulfonamides
- (SOIL) EP231A: Perfluoroalkyl Sulfonic Acids
- (SOIL) EP231P: PFAS Sums
- (SOIL) EP231S: PFAS Surrogate
- (SOIL) EA055: Moisture Content (Dried @ 105-110°C)

QUALITY CONTROL REPORT

Work Order : ET2301455
Page : 1 of 12
Client : [REDACTED]
Contact : [REDACTED]
Address : [REDACTED]

Laboratory : [REDACTED]
Contact : [REDACTED]
Address : [REDACTED]

Telephone : ----
Project : QLD_0229_PFASOMP_23
Order number : 60612487 task 3.1
C-O-C number : 49674
Sampler : [REDACTED]
Site : QLD_0229
Quote number : TV/007/21 v2 - Compass
No. of samples received : 7
No. of samples analysed : 7

Telephone : [REDACTED]
Date Samples Received : 16-Mar-2023
Date Analysis Commenced : 17-Mar-2023
Issue Date : 27-Mar-2023


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 Inorganic Chemist	Brisbane Inorganics, Stafford, QLD
[REDACTED]	Senior Chemist - Organics	Brisbane Organics, Stafford, QLD



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: 4940317)									
EB2307970-017	Anonymous	EA055: Moisture Content	----	0.1	%	8.7	8.9	2.7	No Limit
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 4940314)									
EB2307486-001	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	0.0006	0.0007	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	0.0079	0.0088	11.2	0% - 20%
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
EB2308073-086	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	0.0029	0.0026	12.1	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: 4940314)									
EB2307486-001	Anonymous	EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	0.0008	0.0008	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	0.0005	0.0005	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	0.0004	0.0004	0.0	No Limit
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	0.0009	0.0009	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	0.0006	0.0007	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	0.0003	0.0003	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	0.0005	0.0005	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 (PFTTrDA)	72629-94-8	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: 4940314) - continued									
EB2307486-001	Anonymous	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
EB2308073-086	Anonymous	EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	0.0003	0.0003	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: 4940314)									
EB2307486-001	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
EB2308073-086	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: 4940314)									



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: 4940314) - continued									
EB2307486-001	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	0.0017	0.0015	11.8	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	0.0028	0.0029	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	0.0010	0.0012	10.1	No Limit
EB2308073-086	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: **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: 4938087)									
ET2301455-001	0229_SW110_230315	EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	33.3	36.5	9.3	0% - 20%
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	36.9	42.8	14.8	0% - 20%
		EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	4.68	4.88	4.2	0% - 20%
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	4.93	4.68	5.3	0% - 20%
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	2.40	2.33	3.0	0% - 20%
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.09	<0.09	0.0	No Limit
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 4938088)									
EB2307921-001	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: 4938087)									
ET2301455-001	0229_SW110_230315	EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	2.67	2.86	7.2	0% - 20%
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	1.91	2.09	8.8	0% - 20%
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	9.79	10.5	6.9	0% - 20%
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	1.16	1.08	6.2	0% - 50%
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.12	<0.12	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.09	<0.09	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.09	<0.09	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: 4938087) - continued									
ET2301455-001	0229_SW110_230315	EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.09	<0.09	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.09	<0.09	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.23	<0.23	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	0.7	0.8	0.0	No Limit
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 4938088)									
EB2307921-001	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: 4938087)									
ET2301455-001	0229_SW110_230315	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.09	<0.09	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.09	<0.09	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.09	<0.09	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.23	<0.23	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.23	<0.23	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.23	<0.23	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.23	<0.23	0.0	No Limit
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 4938088)									
EB2307921-001	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



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: 4938088) - continued									
EB2307921-001	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: 4938087)									
ET2301455-001	0229_SW110_230315	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.09	<0.09	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.09	<0.09	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.09	<0.09	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.09	<0.09	0.0	No Limit
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 4938088)									
EB2307921-001	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: 4938087)									
ET2301455-001	0229_SW110_230315	EP231X: Sum of PFAS	----	0.01	µg/L	98.4	108	9.7	0% - 20%
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	70.2	79.3	12.2	0% - 20%
		EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	91.1	102	10.8	0% - 20%
EP231P: PFAS Sums (QC Lot: 4938088)									
EB2307921-001	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: SOIL

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report				
				Result	Spike Concentration	Spike Recovery (%)		Acceptable Limits (%)	
						LCS	Low	High	
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4940314)									
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	0.0011 mg/kg	114	72.0	128	
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	0.00117 mg/kg	109	73.0	123	
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	0.00118 mg/kg	110	67.0	130	
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	0.00119 mg/kg	116	70.0	132	
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	0.00116 mg/kg	108	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: 4940314)									
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	0.00625 mg/kg	106	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	105	70.0	132	
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	0.00125 mg/kg	105	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	95.2	72.0	129	
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	0.00125 mg/kg	111	69.0	133	
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	116	64.0	136	
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	110	69.0	135	
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	109	66.0	139	
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	0.00312 mg/kg	101	69.0	133	
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4940314)									
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	0.00125 mg/kg	114	67.0	137	
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	0.00312 mg/kg	108	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	99.8	61.5	139	
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	0.00312 mg/kg	105	61.9	137	
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	0.00125 mg/kg	108	63.0	144	
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	0.00125 mg/kg	98.4	61.0	139	
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4940314)									
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	0.00117 mg/kg	99.6	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	116	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	101	65.0	137	



Sub-Matrix: **SOIL**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report Result	Laboratory Control Spike (LCS) Report				
					Spike Concentration	Spike Recovery (%)		Acceptable Limits (%)	
						LCS	Low	High	
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4940314) - continued									
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	0.0012 mg/kg	111	54.8	124	

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report Result	Laboratory Control Spike (LCS) Report				
					Spike Concentration	Spike Recovery (%)		Acceptable Limits (%)	
						LCS	Low	High	
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4938087)									
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	80.8	71.0	127	
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	0.2373 µg/L	84.9	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	94.8	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: 4938088)									
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.2218 µg/L	125	72.0	130	
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.2352 µg/L	120	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	107	69.0	134	
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.232 µg/L	109	65.0	140	
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.241 µg/L	111	53.0	142	
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4938087)									
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	1.25 µg/L	93.5	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	81.8	72.0	129	
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	0.25 µg/L	81.6	72.0	130	
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	0.25 µg/L	80.4	71.0	133	
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	0.25 µg/L	89.4	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	76.8	69.0	133	
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	0.25 µg/L	90.4	72.0	134	
EP231X: Perfluorotridecanoic acid (PFTTrDA)	72629-94-8	0.02	µg/L	<0.02	0.25 µg/L	85.2	65.0	144	
EP231X: Perfluorotetradecanoic acid (PFTTeDA)	376-06-7	0.05	µg/L	<0.05	0.625 µg/L	96.4	71.0	132	
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4938088)									
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	101	72.0	129	
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	0.25 µg/L	109	72.0	129	
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	0.25 µg/L	108	72.0	130	
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	0.25 µg/L	103	71.0	133	
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	0.25 µg/L	113	69.0	130	
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	0.25 µg/L	103	71.0	129	



Sub-Matrix: WATER

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report				
				Result	Spike	Spike Recovery (%)		Acceptable Limits (%)	
					Concentration	LCS	Low	High	
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4938088) - continued									
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	105	72.0	134	
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	0.25 µg/L	99.0	65.0	144	
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	0.625 µg/L	117	71.0	132	
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4938087)									
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.25 µg/L	80.8	67.0	137	
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	0.625 µg/L	72.2	68.0	141	
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	0.625 µg/L	72.3	60.5	138	
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	0.625 µg/L	81.0	68.3	134	
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	0.625 µg/L	86.3	62.6	138	
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	0.25 µg/L	93.2	65.0	136	
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	0.25 µg/L	83.6	61.0	135	
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4938088)									
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.25 µg/L	102	67.0	137	
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	0.625 µg/L	120	68.0	141	
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	0.625 µg/L	131	60.5	138	
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	0.625 µg/L	126	68.3	134	
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	0.625 µg/L	98.3	62.6	138	
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	0.25 µg/L	132	65.0	136	
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	0.25 µg/L	116	61.0	135	
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4938087)									
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	99.4	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	92.5	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	88.8	64.2	133	
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4938088)									
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	126	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	84.4	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	91.9	64.2	133	
EP231P: PFAS Sums (QCLot: 4938087)									



Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report Result	Laboratory Control Spike (LCS) Report			
					Spike Concentration	Spike Recovery (%)	Acceptable Limits (%)	
						LCS	Low	High
EP231P: PFAS Sums (QCLot: 4938087) - continued								
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: 4938088)								
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: **SOIL**

Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report			
				Spike Concentration	Spike Recovery (%) MS	Acceptable Limits (%)	
				Low	High		
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4940314)							
EB2307486-004	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.00117 mg/kg	126	72.0	128
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.00117 mg/kg	115	73.0	123
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.00118 mg/kg	103	67.0	130
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.00119 mg/kg	97.0	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	121	59.0	134
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4940314)							
EB2307486-004	Anonymous	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.00625 mg/kg	126	71.0	135
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.00125 mg/kg	132	69.0	132
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.00125 mg/kg	128	70.0	132
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.00125 mg/kg	107	71.0	131
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.00125 mg/kg	122	69.0	133
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.00125 mg/kg	126	72.0	129
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.00125 mg/kg	124	69.0	133
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.00125 mg/kg	122	64.0	136
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.00125 mg/kg	113	69.0	135
		EP231X: Perfluorotridecanoic acid (PFTeDA)	72629-94-8	0.00125 mg/kg	114	66.0	139
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.00312 mg/kg	114	69.0	133
		EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4940314)					



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: 4940314) - continued							
EB2307486-004	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.00125 mg/kg	107	48.0	128
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.00312 mg/kg	119	70.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.00312 mg/kg	117	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.00312 mg/kg	87.8	70.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.00312 mg/kg	102	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.00125 mg/kg	102	63.0	144
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.00125 mg/kg	96.8	61.0	139
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4940314)							
EB2307486-004	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.00117 mg/kg	101	62.0	145
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.00118 mg/kg	140	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0012 mg/kg	136	65.0	137
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0012 mg/kg	101	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
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4938088)							
EB2307921-002	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.2218 µg/L	105	72.0	130
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.235 µg/L	95.7	71.0	127
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.2352 µg/L	95.4	68.0	131
		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	92.6	65.0	140
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.241 µg/L	107	53.0	142
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4938088)							
EB2307921-002	Anonymous	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	1.25 µg/L	80.4	73.0	129
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.25 µg/L	91.1	72.0	129
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.25 µg/L	97.9	72.0	129
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.25 µg/L	89.1	72.0	130
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.25 µg/L	88.6	71.0	133
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.25 µg/L	95.0	69.0	130
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.25 µg/L	99.5	71.0	129
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.25 µg/L	96.0	69.0	133
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.25 µg/L	89.4	72.0	134
		EP231X: Perfluorotridecanoic acid (PFTTrDA)	72629-94-8	0.25 µg/L	75.2	65.0	144



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: 4938088) - continued							
EB2307921-002	Anonymous	EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.625 µg/L	102	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4938088)							
EB2307921-002	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.25 µg/L	106	59.0	135
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.625 µg/L	116	70.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.625 µg/L	109	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	99.0	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.25 µg/L	95.6	65.0	136
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.25 µg/L	112	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4938088)							
EB2307921-002	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.234 µg/L	83.6	63.0	143
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.2378 µg/L	127	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	92.1	70.0	130

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: ET2301455	Page	: 1 of 6
Client	: [REDACTED]	Laboratory	: [REDACTED]
Contact	: [REDACTED]	Telephone	: [REDACTED]
Project	: QLD_0229_PFASOMP_23	Date Samples Received	: 16-Mar-2023
Site	: QLD_0229	Issue Date	: 27-Mar-2023
Sampler	: [REDACTED]	No. of samples received	: 7
Order number	: 60612487 task 3.1	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: **SOIL**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
Matrix Spike (MS) Recoveries							
EP231A: Perfluoroalkyl Sulfonic Acids	EB2307486--004	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
	QC	Regular	Actual	Expected	
Laboratory Duplicates (DUP)					
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	2	28	7.14	10.00	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)					
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	1	28	3.57	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: **SOIL**

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

Method	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)								
0229_SD233_230315,	0229_QC107_230315	15-Mar-2023	----	----	----	20-Mar-2023	29-Mar-2023	✓
EP231A: Perfluoroalkyl Sulfonic Acids								
HDPE Soil Jar (EP231X)								
0229_SD233_230315,	0229_QC107_230315	15-Mar-2023	21-Mar-2023	11-Sep-2023	✓	23-Mar-2023	30-Apr-2023	✓
EP231B: Perfluoroalkyl Carboxylic Acids								
HDPE Soil Jar (EP231X)								
0229_SD233_230315,	0229_QC107_230315	15-Mar-2023	21-Mar-2023	11-Sep-2023	✓	23-Mar-2023	30-Apr-2023	✓
EP231C: Perfluoroalkyl Sulfonamides								
HDPE Soil Jar (EP231X)								
0229_SD233_230315,	0229_QC107_230315	15-Mar-2023	21-Mar-2023	11-Sep-2023	✓	23-Mar-2023	30-Apr-2023	✓
EP231D: (n:2) Fluorotelomer Sulfonic Acids								
HDPE Soil Jar (EP231X)								
0229_SD233_230315,	0229_QC107_230315	15-Mar-2023	21-Mar-2023	11-Sep-2023	✓	23-Mar-2023	30-Apr-2023	✓



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) 0229_SD233_230315,	0229_QC107_230315	15-Mar-2023	21-Mar-2023	11-Sep-2023	✓	23-Mar-2023	30-Apr-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) 0229_QC351_230307		07-Mar-2023	20-Mar-2023	03-Sep-2023	✓	21-Mar-2023	03-Sep-2023	✓
HDPE (no PTFE) (EP231X) 0229_QC352_230308		08-Mar-2023	20-Mar-2023	04-Sep-2023	✓	21-Mar-2023	04-Sep-2023	✓
HDPE (no PTFE) (EP231X) 0229_SW110_230315, 0229_QC360_230315	0229_QC106_230315,	15-Mar-2023	20-Mar-2023	11-Sep-2023	✓	21-Mar-2023	11-Sep-2023	✓
EP231B: Perfluoroalkyl Carboxylic Acids								
HDPE (no PTFE) (EP231X) 0229_QC351_230307		07-Mar-2023	20-Mar-2023	03-Sep-2023	✓	21-Mar-2023	03-Sep-2023	✓
HDPE (no PTFE) (EP231X) 0229_QC352_230308		08-Mar-2023	20-Mar-2023	04-Sep-2023	✓	21-Mar-2023	04-Sep-2023	✓
HDPE (no PTFE) (EP231X) 0229_SW110_230315, 0229_QC360_230315	0229_QC106_230315,	15-Mar-2023	20-Mar-2023	11-Sep-2023	✓	21-Mar-2023	11-Sep-2023	✓
EP231C: Perfluoroalkyl Sulfonamides								
HDPE (no PTFE) (EP231X) 0229_QC351_230307		07-Mar-2023	20-Mar-2023	03-Sep-2023	✓	21-Mar-2023	03-Sep-2023	✓
HDPE (no PTFE) (EP231X) 0229_QC352_230308		08-Mar-2023	20-Mar-2023	04-Sep-2023	✓	21-Mar-2023	04-Sep-2023	✓
HDPE (no PTFE) (EP231X) 0229_SW110_230315, 0229_QC360_230315	0229_QC106_230315,	15-Mar-2023	20-Mar-2023	11-Sep-2023	✓	21-Mar-2023	11-Sep-2023	✓
EP231D: (n:2) Fluorotelomer Sulfonic Acids								
HDPE (no PTFE) (EP231X) 0229_QC351_230307		07-Mar-2023	20-Mar-2023	03-Sep-2023	✓	21-Mar-2023	03-Sep-2023	✓
HDPE (no PTFE) (EP231X) 0229_QC352_230308		08-Mar-2023	20-Mar-2023	04-Sep-2023	✓	21-Mar-2023	04-Sep-2023	✓
HDPE (no PTFE) (EP231X) 0229_SW110_230315, 0229_QC360_230315	0229_QC106_230315,	15-Mar-2023	20-Mar-2023	11-Sep-2023	✓	21-Mar-2023	11-Sep-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
EP231P: PFAS Sums							
HDPE (no PTFE) (EP231X) 0229_QC351_230307	07-Mar-2023	20-Mar-2023	03-Sep-2023	✓	21-Mar-2023	03-Sep-2023	✓
HDPE (no PTFE) (EP231X) 0229_QC352_230308	08-Mar-2023	20-Mar-2023	04-Sep-2023	✓	21-Mar-2023	04-Sep-2023	✓
HDPE (no PTFE) (EP231X) 0229_SW110_230315, 0229_QC360_230315	15-Mar-2023	20-Mar-2023	11-Sep-2023	✓	21-Mar-2023	11-Sep-2023	✓



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	Method	Count		Rate (%)			Quality Control Specification
		QC	Regular	Actual	Expected	Evaluation	
Analytical Methods							
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	16	12.50	10.00	✔	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	16	6.25	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	16	6.25	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	16	6.25	5.00	✔	NEPM 2013 B3 & ALS QC Standard

Matrix: **WATER** Evaluation: ✘ = Quality Control frequency not within specification ; ✔ = Quality Control frequency within specification.

Quality Control Sample Type	Method	Count		Rate (%)			Quality Control Specification
		QC	Regular	Actual	Expected	Evaluation	
Analytical Methods							
Laboratory Duplicates (DUP)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	28	7.14	10.00	✘	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	28	7.14	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	28	7.14	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	28	3.57	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.
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
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.
Solid Phase Extraction (SPE) for PFAS in water	ORG72	WATER	In-house: Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to the sample container. The entire contents are transferred to a solid phase extraction (SPE) cartridge. The sample container is successively rinsed with aliquots of the elution solvent. The eluted extract is combined with an equal volume of reagent water and a portion is filtered for analysis. Method procedures conform to US DoD QSM 5.3, table B-15 requirements.



SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : ET2301455

Client : [Redacted]
Contact : [Redacted]
Address : [Redacted]

Laboratory : [Redacted]
Contact : [Redacted]
Address : [Redacted]
QLD Australia 4815

E-mail : [Redacted]
Telephone : ---
Facsimile : ---

E-mail : [Redacted]
Telephone : [Redacted]
Facsimile : ---

Project : QLD_0229_PFASOMP_23
Order number : 60612487 task 3.1

Page : 1 of 3
Quote number : ET2021AECOMAU0001 (TV/007/21 v2 - Compass)

C-O-C number : 49674

QC Level : NEPM 2013 B3 & ALS QC Standard

Site : QLD_0229

Sampler : [Redacted]

Dates

Date Samples Received : 16-Mar-2023 12:52
Client Requested Due Date : 27-Mar-2023

Issue Date : 17-Mar-2023
Scheduled Reporting Date : 27-Mar-2023

Delivery Details

Mode of Delivery : Carrier
No. of coolers/boxes : 1
Receipt Detail : MEDIUM ESKY

Security Seal : Intact.
Temperature : 12.1°C - Ice present
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
*Samples were originally received by ALS Townsville on 15/03/2023 and have been forwarded to ALS Brisbane for analysis.
Temperature on arrival in ALS Brisbane has been noted above.
Discounted Package Prices apply only when specific ALS Group Codes ('W', 'S', 'NT' suites) are referenced on COCs.
\$\$ conducted by ALS Townsville, NATA accreditation no. 825, (Site no. 23472 for Chemical Testing and Site no. 23313 for Biological Testing)
Please direct any turn around / technical queries to the laboratory contact designated above.
Sample Disposal - Aqueous (3 weeks), Solid (2 months ± 1 week) from receipt of samples.
All remaining analysis will be conducted by ALS Environmental, Brisbane, NATA accreditation no. 825, Site No. 818.
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.
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.



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)
ET2301455-003	15-Mar-2023 10:53	0229_SD233_230315	✓	✓
ET2301455-007	15-Mar-2023 10:56	0229_QC107_230315	✓	✓

Matrix: **WATER**

Laboratory sample ID	Sampling date / time	Sample ID	WATER - EP231X PFAS - Full Suite (28 analytes)
ET2301455-001	15-Mar-2023 10:03	0229_SW110_230315	✓
ET2301455-002	15-Mar-2023 10:04	0229_QC106_230315	✓
ET2301455-004	15-Mar-2023 10:53	0229_QC360_230315	✓
ET2301455-005	07-Mar-2023 18:00	0229_QC351_230307	✓
ET2301455-006	08-Mar-2023 18:00	0229_QC352_230308	✓

Proactive Holding Time Report

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



Requested Deliverables

ACCOUNTS PAYABLE

- A4 - AU Tax Invoice (INV)

Email AP_CustomerService.ANZ@aecom.com

[REDACTED]

- *AU Certificate of Analysis - NATA (COA)
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)
- A4 - AU Tax Invoice (INV)
- Chain of Custody (CoC) (COC)
- EDI Format - EQUIS V5 AECOM (EQUIS_V5_AECOM)
- EDI Format - ESDAT (ESDAT)

Email
Email
Email
Email
Email
Email
Email
Email

[REDACTED]

[REDACTED]

- *AU Certificate of Analysis - NATA (COA)
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)
- Chain of Custody (CoC) (COC)
- EDI Format - EQUIS V5 AECOM (EQUIS_V5_AECOM)
- EDI Format - ESDAT (ESDAT)

Email
Email
Email
Email
Email
Email
Email

[REDACTED]

DERP ESDAT REPORTS

- *AU Certificate of Analysis - NATA (COA)
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)
- Chain of Custody (CoC) (COC)
- EDI Format - EQUIS V5 AECOM (EQUIS_V5_AECOM)
- EDI Format - ESDAT (ESDAT)

Email
Email
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Email
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Email

[REDACTED]

[REDACTED]

- *AU Certificate of Analysis - NATA (COA)
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)
- Chain of Custody (CoC) (COC)
- EDI Format - EQUIS V5 AECOM (EQUIS_V5_AECOM)
- EDI Format - ESDAT (ESDAT)

Email
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[REDACTED]



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ABN: 91 05 0159 898

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Company Name: AECOM Aust Pty Ltd TSV
Address: Level 5/7-13 Tomlins St
South Townsville
QLD 4810

Project Name: QLD_0229
Project ID: QLD_0229_PFASOMP_23

Order No.: 60612487_3.1
Report #: 972979
Phone: 0428 644 967
Fax:

Received: Mar 17, 2023 2:35 PM
Due: Mar 24, 2023
Priority: 5 Day
Contact Name: [REDACTED]

Eurofins Analytical Services Manager : [REDACTED]

Sample Detail						Moisture Set	Per- and Polyfluoroalkyl Substances (PFASs)
Brisbane Laboratory - NATA # 1261 Site # 20794						X	X
External Laboratory							
No	Sample ID	Sample Date	Sampling Time	Matrix	LAB ID		
1	0229_QC200_230306	Mar 06, 2023	3:00PM	Water	TW23-Ma0042598		X
2	0229_QC201_230308	Mar 08, 2023		Water	TW23-Ma0042599		X
3	0229_QC202_230309	Mar 09, 2023		Water	TW23-Ma0042600		X
4	0229_QC206_230315	Mar 15, 2023	8:40AM	Water	TW23-Ma0042601		X
5	0229_QC205_230306	Mar 06, 2023	3:00PM	Soil	TW23-Ma0042602	X	X
6	0229_QC207_230315	Mar 15, 2023	9:30AM	Soil	TW23-Ma0042603	X	X
7	0229_QC251_230306	Mar 06, 2023	11:23AM	Soil	TW23-Ma0042604	X	X
8	0229_QC253_230306	Mar 06, 2023	3:50PM	Soil	TW23-Ma0042605	X	X



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NATA# 1261 Site# 18217

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NATA# 1261 Site# 25466

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NATA# 1261 Site# 20794

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Company Name:	AECOM Aust Pty Ltd TSV	Order No.:	60612487_3.1	Received:	Mar 17, 2023 2:35 PM
Address:	Level 5/7-13 Tomlins St South Townsville QLD 4810	Report #:	972979	Due:	Mar 24, 2023
Project Name:	QLD_0229	Phone:	0428 644 967	Priority:	5 Day
Project ID:	QLD_0229_PFASOMP_23	Fax:		Contact Name:	[REDACTED]

Eurofins Analytical Services Manager : [REDACTED]

Sample Detail						Moisture Set	Per- and Polyfluoroalkyl Substances (PFASs)
Brisbane Laboratory - NATA # 1261 Site # 20794						X	X
9	0229_QC203_230309	Mar 09, 2023	11:50AM	Water	TW23-Ma0042606		X
10	0229_QC250_230306	Mar 06, 2023	11:23AM	Water	TW23-Ma0042607		X
11	0229_QC252_230306	Mar 06, 2023	1:30PM	Water	TW23-Ma0042608		X
12	0229_QC254_230308	Mar 08, 2023		Water	TW23-Ma0042609		X
Test Counts						4	12

AECOM Aust Pty Ltd TSV
 Level 5/7-13 Tomlins St
 South Townsville
 QLD 4810



NATA Accredited
 Accreditation Number 1261
 Site Number 20794

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:



Report **972979-S**
 Project name [QLD_0229](#)
 Project ID [QLD_0229_PFASOMP_23](#)
 Received Date Mar 17, 2023

Client Sample ID			0229_QC205_2 30306	0229_QC207_2 30315	0229_QC251_2 30306	0229_QC253_2 30306
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			TW23- Ma0042602	TW23- Ma0042603	TW23- Ma0042604	TW23- Ma0042605
Date Sampled			Mar 06, 2023	Mar 15, 2023	Mar 06, 2023	Mar 06, 2023
Test/Reference	LOR	Unit				
Sample Properties						
% Moisture	1	%	38	15	20	20
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 (PFTTrDA) ^{N15}	5	ug/kg	< 5	< 5	< 5	< 5
Perfluorotetradecanoic acid (PFTeDA) ^{N11}	5	ug/kg	< 5	< 5	< 5	< 5
13C4-PFBA (surr.)	1	%	79	80	85	90
13C5-PFPeA (surr.)	1	%	96	97	82	90
13C5-PFHxA (surr.)	1	%	67	67	71	76
13C4-PFHpA (surr.)	1	%	71	67	75	74
13C8-PFOA (surr.)	1	%	77	71	69	72
13C5-PFNA (surr.)	1	%	84	82	78	83
13C6-PFDA (surr.)	1	%	81	78	79	82
13C2-PFUnDA (surr.)	1	%	81	82	81	85
13C2-PFDoDA (surr.)	1	%	79	74	82	87
13C2-PFTeDA (surr.)	1	%	78	80	84	93
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			0229_QC205_2 30306	0229_QC207_2 30315	0229_QC251_2 30306	0229_QC253_2 30306
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			TW23- Ma0042602	TW23- Ma0042603	TW23- Ma0042604	TW23- Ma0042605
Date Sampled			Mar 06, 2023	Mar 15, 2023	Mar 06, 2023	Mar 06, 2023
Test/Reference	LOR	Unit				
Perfluoroalkyl sulfonamido substances						
13C8-FOSA (surr.)	1	%	74	80	88	93
D3-N-MeFOSA (surr.)	1	%	87	72	80	102
D5-N-EtFOSA (surr.)	1	%	82	61	98	104
D7-N-MeFOSE (surr.)	1	%	69	65	87	93
D9-N-EtFOSE (surr.)	1	%	73	59	95	99
D5-N-EtFOSAA (surr.)	1	%	71	89	79	89
D3-N-MeFOSAA (surr.)	1	%	83	90	91	90
Perfluoroalkyl sulfonic acids (PFASs)						
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	5.8	< 5	< 5
Perfluorodecanesulfonic acid (PFDS) ^{N15}	5	ug/kg	< 5	< 5	< 5	< 5
13C3-PFBS (surr.)	1	%	71	67	78	70
18O2-PFHxS (surr.)	1	%	88	94	84	85
13C8-PFOS (surr.)	1	%	81	83	80	86
n:2 Fluorotelomer sulfonic acids (n:2 FTSA)						
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	%	103	117	85	107
13C2-6:2 FTSA (surr.)	1	%	108	127	81	115
13C2-8:2 FTSA (surr.)	1	%	79	91	81	85
13C2-10:2 FTSA (surr.)	1	%	93	106	96	110
PFASs Summations						
Sum (PFHxS + PFOS)*	5	ug/kg	< 5	5.8	< 5	< 5
Sum of US EPA PFAS (PFOS + PFOA)*	5	ug/kg	< 5	5.8	< 5	< 5
Sum of enHealth PFAS (PFHxS + PFOS + PFOA)*	5	ug/kg	< 5	5.8	< 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 - Method: LTM-GEN-7080 Moisture	Brisbane	Mar 17, 2023	14 Days
Per- and Polyfluoroalkyl Substances (PFASs)			
Perfluoroalkyl carboxylic acids (PFCAs) - Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)	Brisbane	Mar 22, 2023	28 Days
Perfluoroalkyl sulfonamido substances - Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)	Brisbane	Mar 22, 2023	28 Days
Perfluoroalkyl sulfonic acids (PFSAs) - Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)	Brisbane	Mar 22, 2023	28 Days
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs) - Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)	Brisbane	Mar 22, 2023	28 Days

ABN: 50 005 085 521

ABN: 91 05 0159 898

NZBN: 9429046024954

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Company Name:	AECOM Aust Pty Ltd TSV	Order No.:	60612487_3.1	Received:	Mar 17, 2023 2:35 PM
Address:	Level 5/7-13 Tomlins St South Townsville QLD 4810	Report #:	972979	Due:	Mar 24, 2023
Project Name:	QLD_0229	Phone:	0428 644 967	Priority:	5 Day
Project ID:	QLD_0229_PFASOMP_23	Fax:		Contact Name:	[REDACTED]
Eurofins Analytical Services Manager : [REDACTED]					

Sample Detail						Moisture Set	Per- and Polyfluoroalkyl Substances (PFASs)
Brisbane Laboratory - NATA # 1261 Site # 20794						X	X
External Laboratory							
No	Sample ID	Sample Date	Sampling Time	Matrix	LAB ID		
1	0229_QC200_230306	Mar 06, 2023	3:00PM	Water	TW23-Ma0042598		X
2	0229_QC201_230308	Mar 08, 2023		Water	TW23-Ma0042599		X
3	0229_QC202_230309	Mar 09, 2023		Water	TW23-Ma0042600		X
4	0229_QC206_230315	Mar 15, 2023	8:40AM	Water	TW23-Ma0042601		X
5	0229_QC205_230306	Mar 06, 2023	3:00PM	Soil	TW23-Ma0042602	X	X
6	0229_QC207_230315	Mar 15, 2023	9:30AM	Soil	TW23-Ma0042603	X	X
7	0229_QC251_230306	Mar 06, 2023	11:23AM	Soil	TW23-Ma0042604	X	X
8	0229_QC253_230306	Mar 06, 2023	3:50PM	Soil	TW23-Ma0042605	X	X

Company Name:	AECOM Aust Pty Ltd TSV	Order No.:	60612487_3.1	Received:	Mar 17, 2023 2:35 PM
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Project Name:	QLD_0229	Phone:	0428 644 967	Priority:	5 Day
Project ID:	QLD_0229_PFASOMP_23	Fax:		Contact Name:	[REDACTED]
Eurofins Analytical Services Manager : [REDACTED]					

Sample Detail						Moisture Set	Per- and Polyfluoroalkyl Substances (PFASs)
Brisbane Laboratory - NATA # 1261 Site # 20794						X	X
9	0229_QC203_230309	Mar 09, 2023	11:50AM	Water	TW23-Ma0042606		X
10	0229_QC250_230306	Mar 06, 2023	11:23AM	Water	TW23-Ma0042607		X
11	0229_QC252_230306	Mar 06, 2023	1:30PM	Water	TW23-Ma0042608		X
12	0229_QC254_230308	Mar 08, 2023		Water	TW23-Ma0042609		X
Test Counts						4	12

Internal Quality Control Review and Glossary

General

- Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples follows guidelines delineated in the National Environment Protection (Assessment of Site Contamination) Measure 1999, as amended May 2013 and are included in this QC report where applicable. Additional QC data may be available on request.
- All soil/sediment/solid results are reported on a dry basis, unless otherwise stated.
- All biota/food results are reported on a wet weight basis on the edible portion, unless otherwise stated.
- Actual LORs are matrix dependant. Quoted LORs may be raised where sample extracts are diluted due to interferences.
- Results are uncorrected for matrix spikes or surrogate recoveries except for PFAS compounds.
- SVOC analysis on waters are performed on homogenised, unfiltered samples, unless noted otherwise.
- Samples were analysed on an 'as received' basis.
- Information identified on this report with blue colour, indicates data provided by customer that may have an impact on the results.
- This report replaces any interim results previously issued.

Holding Times

Please refer to '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 prior to sample receipt deadlines as stated on the SRA.

If the Laboratory did not receive the information in the required timeframe, and regardless of any other integrity issues, suitably qualified results may still be reported.

Holding times apply from the date of sampling, therefore compliance to 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 then the holding time is 14 days.

Units

mg/kg: milligrams per kilogram	mg/L: milligrams per litre	µg/L: micrograms per litre
ppm: parts per million	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		

Terms

APHA	American Public Health Association
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 a moisture has been determined on a solid sample the result is expressed on a dry 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 is representative of 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 like compound to the analyte target and reported as percentage recovery.
TBTO	Tributyltin oxide (<i>bis</i> -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 be used as a guide only 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

PFAS field samples that contain surrogate recoveries in excess of the QC limit designated in QSM 5.4 where no positive PFAS results have been reported have been reviewed and no data was affected.

QC Data General Comments

- Where a result is reported as a 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.
- 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 is not data from your samples.
- 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.
- Recovery Data (Spikes & Surrogates) - where chromatographic interference does not allow the determination of recovery the term "INT" appears against that analyte.
- For Matrix Spikes and LCS results a dash "-" in the report means that the specific analyte was not added to the QC sample.
- 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 (PFTTrDA)	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 (PFASs)						
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 FTSA)						
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)	%	98		50-150	Pass	
Perfluoropentanoic acid (PFPeA)	%	104		50-150	Pass	
Perfluorohexanoic acid (PFHxA)	%	94		50-150	Pass	
Perfluoroheptanoic acid (PFHpA)	%	95		50-150	Pass	
Perfluorooctanoic acid (PFOA)	%	96		50-150	Pass	
Perfluorononanoic acid (PFNA)	%	113		50-150	Pass	
Perfluorodecanoic acid (PFDA)	%	91		50-150	Pass	
Perfluoroundecanoic acid (PFUnDA)	%	112		50-150	Pass	
Perfluorododecanoic acid (PFDoDA)	%	118		50-150	Pass	
Perfluorotridecanoic acid (PFTTrDA)	%	116		50-150	Pass	
Perfluorotetradecanoic acid (PFTeDA)	%	118		50-150	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code	
LCS - % Recovery								
Perfluoroalkyl sulfonamido substances								
Perfluorooctane sulfonamide (FOSA)	%	73			50-150	Pass		
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	%	101			50-150	Pass		
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	%	78			50-150	Pass		
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)	%	91			50-150	Pass		
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)	%	106			50-150	Pass		
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	%	95			50-150	Pass		
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	%	104			50-150	Pass		
LCS - % Recovery								
Perfluoroalkyl sulfonic acids (PFSA's)								
Perfluorobutanesulfonic acid (PFBS)	%	81			50-150	Pass		
Perfluorononanesulfonic acid (PFNS)	%	102			50-150	Pass		
Perfluoropropanesulfonic acid (PFPrS)	%	57			50-150	Pass		
Perfluoropentanesulfonic acid (PFPeS)	%	71			50-150	Pass		
Perfluorohexanesulfonic acid (PFHxS)	%	91			50-150	Pass		
Perfluoroheptanesulfonic acid (PFHpS)	%	79			50-150	Pass		
Perfluorooctanesulfonic acid (PFOS)	%	88			50-150	Pass		
Perfluorodecanesulfonic acid (PFDS)	%	74			50-150	Pass		
LCS - % Recovery								
n:2 Fluorotelomer sulfonic acids (n:2 FTSA's)								
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	%	106			50-150	Pass		
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)	%	97			50-150	Pass		
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	%	95			50-150	Pass		
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	%	113			50-150	Pass		
Test	Lab Sample ID	QA Source	Units	Result 1		Acceptance Limits	Pass Limits	Qualifying Code
Spike - % Recovery								
Perfluoroalkyl carboxylic acids (PFCAs)								
Perfluorobutanoic acid (PFBA)	TW23-Ma0042603	CP	%	97		50-150	Pass	
Perfluoropentanoic acid (PFPeA)	TW23-Ma0042603	CP	%	108		50-150	Pass	
Perfluorohexanoic acid (PFHxA)	TW23-Ma0042603	CP	%	93		50-150	Pass	
Perfluoroheptanoic acid (PFHpA)	TW23-Ma0042603	CP	%	96		50-150	Pass	
Perfluorooctanoic acid (PFOA)	TW23-Ma0042603	CP	%	99		50-150	Pass	
Perfluorononanoic acid (PFNA)	TW23-Ma0042603	CP	%	101		50-150	Pass	
Perfluorodecanoic acid (PFDA)	TW23-Ma0042603	CP	%	91		50-150	Pass	
Perfluoroundecanoic acid (PFUnDA)	TW23-Ma0042603	CP	%	115		50-150	Pass	
Perfluorododecanoic acid (PFDoDA)	TW23-Ma0042603	CP	%	106		50-150	Pass	
Perfluorotridecanoic acid (PFTrDA)	TW23-Ma0042603	CP	%	115		50-150	Pass	
Perfluorotetradecanoic acid (PFTeDA)	TW23-Ma0042603	CP	%	119		50-150	Pass	
Spike - % Recovery								
Perfluoroalkyl sulfonamido substances								
Perfluorooctane sulfonamide (FOSA)	TW23-Ma0042603	CP	%	75		50-150	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	TW23-Ma0042603	CP	%	95		50-150	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	TW23-Ma0042603	CP	%	78			50-150	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)	TW23-Ma0042603	CP	%	100			50-150	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)	TW23-Ma0042603	CP	%	93			50-150	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	TW23-Ma0042603	CP	%	98			50-150	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	TW23-Ma0042603	CP	%	108			50-150	Pass	
Spike - % Recovery									
Perfluoroalkyl sulfonic acids (PFSA's)				Result 1					
Perfluorobutanesulfonic acid (PFBS)	TW23-Ma0042603	CP	%	82			50-150	Pass	
Perfluorononanesulfonic acid (PFNS)	TW23-Ma0042603	CP	%	108			50-150	Pass	
Perfluoropropanesulfonic acid (PFPrS)	TW23-Ma0042603	CP	%	86			50-150	Pass	
Perfluoropentanesulfonic acid (PFPeS)	TW23-Ma0042603	CP	%	89			50-150	Pass	
Perfluorohexanesulfonic acid (PFHxS)	TW23-Ma0042603	CP	%	92			50-150	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	TW23-Ma0042603	CP	%	73			50-150	Pass	
Perfluorooctanesulfonic acid (PFOS)	TW23-Ma0042603	CP	%	99			50-150	Pass	
Perfluorodecanesulfonic acid (PFDS)	TW23-Ma0042603	CP	%	83			50-150	Pass	
Spike - % Recovery									
n:2 Fluorotelomer sulfonic acids (n:2 FTSA's)				Result 1					
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	TW23-Ma0042603	CP	%	102			50-150	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)	TW23-Ma0042603	CP	%	74			50-150	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	TW23-Ma0042603	CP	%	108			50-150	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	TW23-Ma0042603	CP	%	107			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	TW23-Ma0042602	CP	%	38	38	2.1	30%	Pass	
Duplicate									
Perfluoroalkyl carboxylic acids (PFCAs)				Result 1	Result 2	RPD			
Perfluorobutanoic acid (PFBA)	TW23-Ma0042602	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluoropentanoic acid (PFPeA)	TW23-Ma0042602	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorohexanoic acid (PFHxA)	TW23-Ma0042602	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluoroheptanoic acid (PFHpA)	TW23-Ma0042602	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorooctanoic acid (PFOA)	TW23-Ma0042602	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorononanoic acid (PFNA)	TW23-Ma0042602	CP	ug/kg	< 5	< 5	<1	30%	Pass	

Duplicate								
Perfluoroalkyl carboxylic acids (PFCAs)				Result 1	Result 2	RPD		
Perfluorodecanoic acid (PFDA)	TW23-Ma0042602	CP	ug/kg	< 5	< 5	<1	30%	Pass
Perfluoroundecanoic acid (PFUnDA)	TW23-Ma0042602	CP	ug/kg	< 5	< 5	<1	30%	Pass
Perfluorododecanoic acid (PFDoDA)	TW23-Ma0042602	CP	ug/kg	< 5	< 5	<1	30%	Pass
Perfluorotridecanoic acid (PFTrDA)	TW23-Ma0042602	CP	ug/kg	< 5	< 5	<1	30%	Pass
Perfluorotetradecanoic acid (PFTeDA)	TW23-Ma0042602	CP	ug/kg	< 5	< 5	<1	30%	Pass
Duplicate								
Perfluoroalkyl sulfonamido substances				Result 1	Result 2	RPD		
Perfluorooctane sulfonamide (FOSA)	TW23-Ma0042602	CP	ug/kg	< 5	< 5	<1	30%	Pass
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	TW23-Ma0042602	CP	ug/kg	< 5	< 5	<1	30%	Pass
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	TW23-Ma0042602	CP	ug/kg	< 5	< 5	<1	30%	Pass
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)	TW23-Ma0042602	CP	ug/kg	< 5	< 5	<1	30%	Pass
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)	TW23-Ma0042602	CP	ug/kg	< 5	< 5	<1	30%	Pass
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	TW23-Ma0042602	CP	ug/kg	< 10	< 10	<1	30%	Pass
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	TW23-Ma0042602	CP	ug/kg	< 10	< 10	<1	30%	Pass
Duplicate								
Perfluoroalkyl sulfonic acids (PFSA's)				Result 1	Result 2	RPD		
Perfluorobutanesulfonic acid (PFBS)	TW23-Ma0042602	CP	ug/kg	< 5	< 5	<1	30%	Pass
Perfluorononanesulfonic acid (PFNS)	TW23-Ma0042602	CP	ug/kg	< 5	< 5	<1	30%	Pass
Perfluoropropanesulfonic acid (PFPrS)	TW23-Ma0042602	CP	ug/kg	< 5	< 5	<1	30%	Pass
Perfluoropentanesulfonic acid (PFPeS)	TW23-Ma0042602	CP	ug/kg	< 5	< 5	<1	30%	Pass
Perfluorohexanesulfonic acid (PFHxS)	TW23-Ma0042602	CP	ug/kg	< 5	< 5	<1	30%	Pass
Perfluoroheptanesulfonic acid (PFHpS)	TW23-Ma0042602	CP	ug/kg	< 5	< 5	<1	30%	Pass
Perfluorooctanesulfonic acid (PFOS)	TW23-Ma0042602	CP	ug/kg	< 5	< 5	<1	30%	Pass
Perfluorodecanesulfonic acid (PFDS)	TW23-Ma0042602	CP	ug/kg	< 5	< 5	<1	30%	Pass
Duplicate								
n:2 Fluorotelomer sulfonic acids (n:2 FTSA's)				Result 1	Result 2	RPD		
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	TW23-Ma0042602	CP	ug/kg	< 5	< 5	<1	30%	Pass
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)	TW23-Ma0042602	CP	ug/kg	< 10	< 10	<1	30%	Pass
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	TW23-Ma0042602	CP	ug/kg	< 5	< 5	<1	30%	Pass
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	TW23-Ma0042602	CP	ug/kg	< 5	< 5	<1	30%	Pass




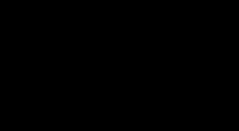
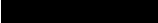
Comments**Sample Integrity**

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:

Analytical Services Manager
Senior Analyst-PFAS
Senior Analyst-Sample Properties

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 or please [click here](#).

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AECOM Aust Pty Ltd TSV
 Level 5/7-13 Tomlins St
 South Townsville
 QLD 4810



NATA Accredited
 Accreditation Number 1261
 Site Number 20794

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 **972979-W**
 Project name [QLD_0229](#)
 Project ID [QLD_0229_PFASOMP_23](#)
 Received Date Mar 17, 2023

Client Sample ID			0229_QC200_2 30306	0229_QC201_2 30308	0229_QC202_2 30309	0229_QC206_2 30315
Sample Matrix			Water	Water	Water	Water
Eurofins Sample No.			TW23- Ma0042598	TW23- Ma0042599	TW23- Ma0042600	TW23- Ma0042601
Date Sampled			Mar 06, 2023	Mar 08, 2023	Mar 09, 2023	Mar 15, 2023
Test/Reference	LOR	Unit				
Perfluoroalkyl carboxylic acids (PFCAs)						
Perfluorobutanoic acid (PFBA) ^{N11}	0.05	ug/L	< 0.05	< 0.05	0.07	0.99
Perfluoropentanoic acid (PFPeA) ^{N11}	0.01	ug/L	< 0.01	< 0.01	< 0.01	1.5
Perfluorohexanoic acid (PFHxA) ^{N11}	0.01	ug/L	0.02	< 0.01	< 0.01	7.5
Perfluoroheptanoic acid (PFHpA) ^{N11}	0.01	ug/L	< 0.01	< 0.01	< 0.01	^{N09} 1.3
Perfluorooctanoic acid (PFOA) ^{N11}	0.01	ug/L	< 0.01	< 0.01	< 0.01	^{N09} 2.7
Perfluorononanoic acid (PFNA) ^{N11}	0.01	ug/L	< 0.01	< 0.01	< 0.01	^{N09} 0.11
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 (PFTTrDA) ^{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	%	101	128	88	66
13C5-PFPeA (surr.)	1	%	103	138	119	67
13C5-PFHxA (surr.)	1	%	129	119	119	⁰⁰⁹ 168
13C4-PFHpA (surr.)	1	%	81	62	118	79
13C8-PFOA (surr.)	1	%	128	67	98	134
13C5-PFNA (surr.)	1	%	119	64	121	95
13C6-PFDA (surr.)	1	%	133	98	106	47
13C2-PFUnDA (surr.)	1	%	133	77	86	77
13C2-PFDoDA (surr.)	1	%	115	74	59	58
13C2-PFTeDA (surr.)	1	%	100	54	52	58
Perfluoroalkyl sulfonamido substances						
Perfluorooctane sulfonamide (FOSA) ^{N11}	0.05	ug/L	< 0.05	< 0.05	< 0.05	^{N09} 0.07
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	%	109	75	95	101
D3-N-MeFOSA (surr.)	1	%	118	88	77	105

Client Sample ID			0229_QC200_2 30306	0229_QC201_2 30308	0229_QC202_2 30309	0229_QC206_2 30315
Sample Matrix			Water	Water	Water	Water
Eurofins Sample No.			TW23- Ma0042598	TW23- Ma0042599	TW23- Ma0042600	TW23- Ma0042601
Date Sampled			Mar 06, 2023	Mar 08, 2023	Mar 09, 2023	Mar 15, 2023
Test/Reference	LOR	Unit				
Perfluoroalkyl sulfonamido substances						
D5-N-EtFOSA (surr.)	1	%	126	77	68	98
D7-N-MeFOSE (surr.)	1	%	53	107	96	106
D9-N-EtFOSE (surr.)	1	%	66	126	94	101
D5-N-EtFOSAA (surr.)	1	%	107	85	102	104
D3-N-MeFOSAA (surr.)	1	%	137	74	84	83
Perfluoroalkyl sulfonic acids (PFASs)						
Perfluorobutanesulfonic acid (PFBS) ^{N11}	0.01	ug/L	0.01	0.02	0.07	^{N09} 2.8
Perfluorononanesulfonic acid (PFNS) ^{N15}	0.01	ug/L	< 0.01	< 0.01	< 0.01	^{N09} 0.06
Perfluoropropanesulfonic acid (PFPrS) ^{N15}	0.01	ug/L	< 0.01	< 0.01	< 0.01	1.4
Perfluoropentanesulfonic acid (PFPeS) ^{N15}	0.01	ug/L	< 0.01	< 0.01	< 0.01	^{N09} 2.5
Perfluorohexanesulfonic acid (PFHxS) ^{N11}	0.01	ug/L	0.04	^{N09} 0.01	^{N09} 0.10	^{N09} 29
Perfluoroheptanesulfonic acid (PFHpS) ^{N15}	0.01	ug/L	< 0.01	< 0.01	< 0.01	^{N09} 1.9
Perfluorooctanesulfonic acid (PFOS) ^{N11}	0.01	ug/L	< 0.01	< 0.01	^{N09} 0.10	^{N09} 32
Perfluorodecanesulfonic acid (PFDS) ^{N15}	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
13C3-PFBS (surr.)	1	%	119	110	99	138
18O2-PFHxS (surr.)	1	%	100	61	99	109
13C8-PFOS (surr.)	1	%	116	111	92	134
n:2 Fluorotelomer sulfonic acids (n:2 FTSA)						
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	0.10
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA) ^{N11}	0.01	ug/L	< 0.01	< 0.01	< 0.01	0.02
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	%	72	73	144	108
13C2-6:2 FTSA (surr.)	1	%	90	83	75	^{Q09} 31
13C2-8:2 FTSA (surr.)	1	%	96	93	149	67
13C2-10:2 FTSA (surr.)	1	%	88	64	137	124
PFASs Summations						
Sum (PFHxS + PFOS)*	0.01	ug/L	0.04	0.01	0.2	61
Sum of US EPA PFAS (PFOS + PFOA)*	0.01	ug/L	< 0.01	< 0.01	0.1	34.7
Sum of enHealth PFAS (PFHxS + PFOS + PFOA)*	0.01	ug/L	0.04	0.01	0.2	63.7
Sum of WA DWER PFAS (n=10)*	0.05	ug/L	0.07	< 0.05	0.34	77.91
Sum of PFASs (n=30)*	0.1	ug/L	< 0.1	< 0.1	0.34	83.95

Client Sample ID			0229_QC203_2 30309	0229_QC250_2 30306	0229_QC252_2 30306	0229_QC254_2 30308
Sample Matrix			Water	Water	Water	Water
Eurofins Sample No.			TW23- Ma0042606	TW23- Ma0042607	TW23- Ma0042608	TW23- Ma0042609
Date Sampled			Mar 09, 2023	Mar 06, 2023	Mar 06, 2023	Mar 08, 2023
Test/Reference	LOR	Unit				
Perfluoroalkyl carboxylic acids (PFCAs)						
Perfluorobutanoic acid (PFBA) ^{N11}	0.05	ug/L	< 0.05	< 0.05	0.10	0.08
Perfluoropentanoic acid (PFPeA) ^{N11}	0.01	ug/L	< 0.01	< 0.01	0.11	0.02
Perfluorohexanoic acid (PFHxA) ^{N11}	0.01	ug/L	< 0.01	0.05	0.09	0.09
Perfluoroheptanoic acid (PFHpA) ^{N11}	0.01	ug/L	< 0.01	< 0.01	^{N09} 0.04	^{N09} 0.02
Perfluorooctanoic acid (PFOA) ^{N11}	0.01	ug/L	< 0.01	< 0.01	^{N09} 0.03	^{N09} 0.05
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 (PFTTrDA) ^{N15}	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorotetradecanoic acid (PFTTeDA) ^{N11}	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
13C4-PFBA (surr.)	1	%	101	96	91	103
13C5-PFPeA (surr.)	1	%	128	123	119	129
13C5-PFHxA (surr.)	1	%	121	121	117	114
13C4-PFHpA (surr.)	1	%	135	119	120	118
13C8-PFOA (surr.)	1	%	102	92	81	90
13C5-PFNA (surr.)	1	%	129	124	130	124
13C6-PFDA (surr.)	1	%	119	101	110	97
13C2-PFUnDA (surr.)	1	%	97	88	88	83
13C2-PFDoDA (surr.)	1	%	73	64	61	59
13C2-PFTTeDA (surr.)	1	%	61	53	60	54
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	%	110	108	114	100
D3-N-MeFOSA (surr.)	1	%	113	110	124	91
D5-N-EtFOSA (surr.)	1	%	90	102	105	84
D7-N-MeFOSE (surr.)	1	%	94	94	92	107
D9-N-EtFOSE (surr.)	1	%	88	93	90	98
D5-N-EtFOSAA (surr.)	1	%	129	112	123	114
D3-N-MeFOSAA (surr.)	1	%	107	96	103	93
Perfluoroalkyl sulfonic acids (PFSAs)						
Perfluorobutanesulfonic acid (PFBS) ^{N11}	0.01	ug/L	0.04	^{N09} 0.03	0.05	^{N09} 0.08
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	0.03
Perfluoropentanesulfonic acid (PFPeS) ^{N15}	0.01	ug/L	< 0.01	^{N09} 0.02	^{N09} 0.02	^{N09} 0.07
Perfluorohexanesulfonic acid (PFHxS) ^{N11}	0.01	ug/L	^{N09} 0.03	^{N09} 0.25	^{N09} 0.23	^{N09} 0.74
Perfluoroheptanesulfonic acid (PFHpS) ^{N15}	0.01	ug/L	< 0.01	< 0.01	< 0.01	^{N09} 0.06
Perfluorooctanesulfonic acid (PFOS) ^{N11}	0.01	ug/L	< 0.01	^{N09} 0.33	^{N09} 0.16	^{N09} 2.3
Perfluorodecanesulfonic acid (PFDS) ^{N15}	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01

Client Sample ID			0229_QC203_2 30309	0229_QC250_2 30306	0229_QC252_2 30306	0229_QC254_2 30308
Sample Matrix			Water	Water	Water	Water
Eurofins Sample No.			TW23- Ma0042606	TW23- Ma0042607	TW23- Ma0042608	TW23- Ma0042609
Date Sampled			Mar 09, 2023	Mar 06, 2023	Mar 06, 2023	Mar 08, 2023
Test/Reference	LOR	Unit				
Perfluoroalkyl sulfonic acids (PFSA)						
13C3-PFBS (surr.)	1	%	104	93	92	94
18O2-PFHxS (surr.)	1	%	101	94	96	86
13C8-PFOS (surr.)	1	%	102	91	98	70
n:2 Fluorotelomer sulfonic acids (n:2 FTSA)						
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	%	151	155	150	119
13C2-6:2 FTSA (surr.)	1	%	63	69	68	42
13C2-8:2 FTSA (surr.)	1	%	142	141	146	90
13C2-10:2 FTSA (surr.)	1	%	169	141	142	135
PFASs Summations						
Sum (PFHxS + PFOS)*	0.01	ug/L	0.03	0.58	0.39	3.04
Sum of US EPA PFAS (PFOS + PFOA)*	0.01	ug/L	< 0.01	0.33	0.19	2.35
Sum of enHealth PFAS (PFHxS + PFOS + PFOA)*	0.01	ug/L	0.03	0.58	0.42	3.09
Sum of WA DWER PFAS (n=10)*	0.05	ug/L	0.07	0.66	0.81	3.38
Sum of PFASs (n=30)*	0.1	ug/L	< 0.1	0.68	0.84	3.54

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)	Brisbane	Mar 21, 2023	28 Days
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			
Perfluoroalkyl sulfonamido substances	Brisbane	Mar 21, 2023	28 Days
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			
Perfluoroalkyl sulfonic acids (PFASs)	Brisbane	Mar 21, 2023	28 Days
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)	Brisbane	Mar 21, 2023	28 Days
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			

ABN: 50 005 085 521

ABN: 91 05 0159 898

NZBN: 9429046024954

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Site# 25079 & 25289

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Company Name: AECOM Aust Pty Ltd TSV
Address: Level 5/7-13 Tomlins St
South Townsville
QLD 4810

Project Name: QLD_0229
Project ID: QLD_0229_PFASOMP_23

Order No.: 60612487_3.1
Report #: 972979
Phone: 0428 644 967
Fax:

Received: Mar 17, 2023 2:35 PM
Due: Mar 24, 2023
Priority: 5 Day
Contact Name: [REDACTED]

Eurofins Analytical Services Manager : [REDACTED]

Sample Detail						Moisture Set	Per- and Polyfluoroalkyl Substances (PFASs)
Brisbane Laboratory - NATA # 1261 Site # 20794						X	X
External Laboratory							
No	Sample ID	Sample Date	Sampling Time	Matrix	LAB ID		
1	0229_QC200_230306	Mar 06, 2023	3:00PM	Water	TW23-Ma0042598		X
2	0229_QC201_230308	Mar 08, 2023		Water	TW23-Ma0042599		X
3	0229_QC202_230309	Mar 09, 2023		Water	TW23-Ma0042600		X
4	0229_QC206_230315	Mar 15, 2023	8:40AM	Water	TW23-Ma0042601		X
5	0229_QC205_230306	Mar 06, 2023	3:00PM	Soil	TW23-Ma0042602	X	X
6	0229_QC207_230315	Mar 15, 2023	9:30AM	Soil	TW23-Ma0042603	X	X
7	0229_QC251_230306	Mar 06, 2023	11:23AM	Soil	TW23-Ma0042604	X	X
8	0229_QC253_230306	Mar 06, 2023	3:50PM	Soil	TW23-Ma0042605	X	X

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NATA# 1261 Site# 18217

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NATA# 1261 Site# 25466

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NATA# 1261 Site# 20794

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Company Name:	AECOM Aust Pty Ltd TSV	Order No.:	60612487_3.1	Received:	Mar 17, 2023 2:35 PM
Address:	Level 5/7-13 Tomlins St South Townsville QLD 4810	Report #:	972979	Due:	Mar 24, 2023
Project Name:	QLD_0229	Phone:	0428 644 967	Priority:	5 Day
Project ID:	QLD_0229_PFASOMP_23	Fax:		Contact Name:	[REDACTED]
Eurofins Analytical Services Manager : [REDACTED]					

Sample Detail						Moisture Set	Per- and Polyfluoroalkyl Substances (PFASs)
Brisbane Laboratory - NATA # 1261 Site # 20794						X	X
9	0229_QC203_230309	Mar 09, 2023	11:50AM	Water	TW23-Ma0042606		X
10	0229_QC250_230306	Mar 06, 2023	11:23AM	Water	TW23-Ma0042607		X
11	0229_QC252_230306	Mar 06, 2023	1:30PM	Water	TW23-Ma0042608		X
12	0229_QC254_230308	Mar 08, 2023		Water	TW23-Ma0042609		X
Test Counts						4	12

Internal Quality Control Review and Glossary
General

- Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples follows guidelines delineated in the National Environment Protection (Assessment of Site Contamination) Measure 1999, as amended May 2013 and are included in this QC report where applicable. Additional QC data may be available on request.
- All soil/sediment/solid results are reported on a dry basis, unless otherwise stated.
- All biota/food results are reported on a wet weight basis on the edible portion, unless otherwise stated.
- Actual LORs are matrix dependant. Quoted LORs may be raised where sample extracts are diluted due to interferences.
- Results are uncorrected for matrix spikes or surrogate recoveries except for PFAS compounds.
- SVOC analysis on waters are performed on homogenised, unfiltered samples, unless noted otherwise.
- Samples were analysed on an 'as received' basis.
- Information identified on this report with blue colour, indicates data provided by customer that may have an impact on the results.
- This report replaces any interim results previously issued.

Holding Times

Please refer to '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 prior to sample receipt deadlines as stated on the SRA.

If the Laboratory did not receive the information in the required timeframe, and regardless of any other integrity issues, suitably qualified results may still be reported.

Holding times apply from the date of sampling, therefore compliance to 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 then the holding time is 14 days.

Units

mg/kg: milligrams per kilogram

mg/L: milligrams per litre

µg/L: micrograms per litre

ppm: parts per million

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

Terms

APHA	American Public Health Association
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 a moisture has been determined on a solid sample the result is expressed on a dry 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 is representative of 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 like compound to the analyte target and reported as percentage recovery.
TBTO	Tributyltin oxide (<i>bis</i> -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 be used as a guide only 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

PFAS field samples that contain surrogate recoveries in excess of the QC limit designated in QSM 5.4 where no positive PFAS results have been reported have been reviewed and no data was affected.

QC Data General Comments

- Where a result is reported as a 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.
- 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 is not data from your samples.
- 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.
- Recovery Data (Spikes & Surrogates) - where chromatographic interference does not allow the determination of recovery the term "INT" appears against that analyte.
- For Matrix Spikes and LCS results a dash "-" in the report means that the specific analyte was not added to the QC sample.
- 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 (PFTTrDA)	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 (PFASs)						
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 FTSA)						
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)	%	96		50-150	Pass	
Perfluoropentanoic acid (PFPeA)	%	93		50-150	Pass	
Perfluorohexanoic acid (PFHxA)	%	89		50-150	Pass	
Perfluoroheptanoic acid (PFHpA)	%	79		50-150	Pass	
Perfluorooctanoic acid (PFOA)	%	75		50-150	Pass	
Perfluorononanoic acid (PFNA)	%	82		50-150	Pass	
Perfluorodecanoic acid (PFDA)	%	85		50-150	Pass	
Perfluoroundecanoic acid (PFUnDA)	%	86		50-150	Pass	
Perfluorododecanoic acid (PFDoDA)	%	83		50-150	Pass	
Perfluorotridecanoic acid (PFTTrDA)	%	98		50-150	Pass	
Perfluorotetradecanoic acid (PFTeDA)	%	82		50-150	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code	
LCS - % Recovery								
Perfluoroalkyl sulfonamido substances								
Perfluorooctane sulfonamide (FOSA)	%	85			50-150	Pass		
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	%	61			50-150	Pass		
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	%	66			50-150	Pass		
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)	%	80			50-150	Pass		
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)	%	79			50-150	Pass		
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	%	89			50-150	Pass		
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	%	95			50-150	Pass		
LCS - % Recovery								
Perfluoroalkyl sulfonic acids (PFSA's)								
Perfluorobutanesulfonic acid (PFBS)	%	80			50-150	Pass		
Perfluorononanesulfonic acid (PFNS)	%	98			50-150	Pass		
Perfluoropropanesulfonic acid (PFPrS)	%	106			50-150	Pass		
Perfluoropentanesulfonic acid (PFPeS)	%	53			50-150	Pass		
Perfluorohexanesulfonic acid (PFHxS)	%	97			50-150	Pass		
Perfluoroheptanesulfonic acid (PFHpS)	%	92			50-150	Pass		
Perfluorooctanesulfonic acid (PFOS)	%	102			50-150	Pass		
Perfluorodecanesulfonic acid (PFDS)	%	74			50-150	Pass		
LCS - % Recovery								
n:2 Fluorotelomer sulfonic acids (n:2 FTSA's)								
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	%	145			50-150	Pass		
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)	%	86			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)	%	67			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)	TW23-Ma0042598	CP	%	97		50-150	Pass	
Perfluoropentanoic acid (PFPeA)	TW23-Ma0042598	CP	%	115		50-150	Pass	
Perfluorohexanoic acid (PFHxA)	TW23-Ma0042598	CP	%	90		50-150	Pass	
Perfluoroheptanoic acid (PFHpA)	TW23-Ma0042598	CP	%	82		50-150	Pass	
Perfluorooctanoic acid (PFOA)	TW23-Ma0042598	CP	%	73		50-150	Pass	
Perfluorononanoic acid (PFNA)	TW23-Ma0042598	CP	%	78		50-150	Pass	
Perfluorodecanoic acid (PFDA)	TW23-Ma0042598	CP	%	90		50-150	Pass	
Perfluoroundecanoic acid (PFUnDA)	TW23-Ma0042598	CP	%	92		50-150	Pass	
Perfluorododecanoic acid (PFDoDA)	TW23-Ma0042598	CP	%	94		50-150	Pass	
Perfluorotridecanoic acid (PFTrDA)	TW23-Ma0042598	CP	%	85		50-150	Pass	
Perfluorotetradecanoic acid (PFTeDA)	TW23-Ma0042598	CP	%	103		50-150	Pass	
Spike - % Recovery								
Perfluoroalkyl sulfonamido substances								
				Result 1				
Perfluorooctane sulfonamide (FOSA)	TW23-Ma0042598	CP	%	96		50-150	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	TW23-Ma0042598	CP	%	73		50-150	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1		Acceptance Limits	Pass Limits	Qualifying Code
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	TW23-Ma0042598	CP	%	72		50-150	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)	TW23-Ma0042598	CP	%	110		50-150	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)	TW23-Ma0042598	CP	%	109		50-150	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	TW23-Ma0042598	CP	%	83		50-150	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	TW23-Ma0042598	CP	%	103		50-150	Pass	
Spike - % Recovery								
Perfluoroalkyl sulfonic acids (PFSA's)				Result 1				
Perfluorobutanesulfonic acid (PFBS)	TW23-Ma0042598	CP	%	81		50-150	Pass	
Perfluorononanesulfonic acid (PFNS)	TW23-Ma0042598	CP	%	86		50-150	Pass	
Perfluoropropanesulfonic acid (PFPrS)	TW23-Ma0042598	CP	%	103		50-150	Pass	
Perfluoropentanesulfonic acid (PFPeS)	TW23-Ma0042598	CP	%	57		50-150	Pass	
Perfluorohexanesulfonic acid (PFHxS)	TW23-Ma0042598	CP	%	86		50-150	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	TW23-Ma0042598	CP	%	97		50-150	Pass	
Perfluorooctanesulfonic acid (PFOS)	TW23-Ma0042598	CP	%	88		50-150	Pass	
Perfluorodecanesulfonic acid (PFDS)	TW23-Ma0042598	CP	%	74		50-150	Pass	
Spike - % Recovery								
n:2 Fluorotelomer sulfonic acids (n:2 FTSA's)				Result 1				
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	TW23-Ma0042598	CP	%	143		50-150	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)	TW23-Ma0042598	CP	%	85		50-150	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	TW23-Ma0042598	CP	%	99		50-150	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	TW23-Ma0042598	CP	%	70		50-150	Pass	
Spike - % Recovery								
Perfluoroalkyl carboxylic acids (PFCAs)				Result 1				
Perfluorobutanoic acid (PFBA)	TW23-Ma0042599	CP	%	90		50-150	Pass	
Perfluoropentanoic acid (PFPeA)	TW23-Ma0042599	CP	%	105		50-150	Pass	
Perfluorohexanoic acid (PFHxA)	TW23-Ma0042599	CP	%	98		50-150	Pass	
Perfluoroheptanoic acid (PFHpA)	TW23-Ma0042599	CP	%	102		50-150	Pass	
Perfluorooctanoic acid (PFOA)	TW23-Ma0042599	CP	%	103		50-150	Pass	
Perfluorononanoic acid (PFNA)	TW23-Ma0042599	CP	%	100		50-150	Pass	
Perfluorodecanoic acid (PFDA)	TW23-Ma0042599	CP	%	94		50-150	Pass	
Perfluoroundecanoic acid (PFUnDA)	TW23-Ma0042599	CP	%	94		50-150	Pass	
Perfluorododecanoic acid (PFDoDA)	TW23-Ma0042599	CP	%	101		50-150	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Perfluorotridecanoic acid (PFTrDA)	TW23-Ma0042599	CP	%	104			50-150	Pass	
Perfluorotetradecanoic acid (PFTeDA)	TW23-Ma0042599	CP	%	83			50-150	Pass	
Spike - % Recovery									
Perfluoroalkyl sulfonamido substances				Result 1					
Perfluorooctane sulfonamide (FOSA)	TW23-Ma0042599	CP	%	80			50-150	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	TW23-Ma0042599	CP	%	81			50-150	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	TW23-Ma0042599	CP	%	86			50-150	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)	TW23-Ma0042599	CP	%	107			50-150	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)	TW23-Ma0042599	CP	%	90			50-150	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	TW23-Ma0042599	CP	%	83			50-150	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	TW23-Ma0042599	CP	%	86			50-150	Pass	
Spike - % Recovery									
Perfluoroalkyl sulfonic acids (PFSA)				Result 1					
Perfluorobutanesulfonic acid (PFBS)	TW23-Ma0042599	CP	%	74			50-150	Pass	
Perfluorononanesulfonic acid (PFNS)	TW23-Ma0042599	CP	%	81			50-150	Pass	
Perfluoropropanesulfonic acid (PFPrS)	TW23-Ma0042599	CP	%	72			50-150	Pass	
Perfluoropentanesulfonic acid (PFPeS)	TW23-Ma0042599	CP	%	104			50-150	Pass	
Perfluorohexanesulfonic acid (PFHxS)	TW23-Ma0042599	CP	%	107			50-150	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	TW23-Ma0042599	CP	%	72			50-150	Pass	
Perfluorooctanesulfonic acid (PFOS)	TW23-Ma0042599	CP	%	97			50-150	Pass	
Perfluorodecanesulfonic acid (PFDS)	TW23-Ma0042599	CP	%	71			50-150	Pass	
Spike - % Recovery									
n:2 Fluorotelomer sulfonic acids (n:2 FTSA)				Result 1					
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	TW23-Ma0042599	CP	%	137			50-150	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)	TW23-Ma0042599	CP	%	90			50-150	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	TW23-Ma0042599	CP	%	97			50-150	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	TW23-Ma0042599	CP	%	97			50-150	Pass	
Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Duplicate									
Perfluoroalkyl carboxylic acids (PFCA)				Result 1	Result 2	RPD			
Perfluorobutanoic acid (PFBA)	TW23-Ma0042598	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
Perfluoropentanoic acid (PFPeA)	TW23-Ma0042598	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorohexanoic acid (PFHxA)	TW23-Ma0042598	CP	ug/L	0.02	0.02	<1	30%	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1	Result 2	RPD	Acceptance Limits	Pass Limits	Qualifying Code
Duplicate									
Perfluoroalkyl carboxylic acids (PFCAs)				Result 1	Result 2	RPD			
Perfluoroheptanoic acid (PFHpA)	TW23-Ma0042598	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorooctanoic acid (PFOA)	TW23-Ma0042598	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorononanoic acid (PFNA)	TW23-Ma0042598	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorodecanoic acid (PFDA)	TW23-Ma0042598	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluoroundecanoic acid (PFUnDA)	TW23-Ma0042598	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorododecanoic acid (PFDoDA)	TW23-Ma0042598	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorotridecanoic acid (PFTrDA)	TW23-Ma0042598	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorotetradecanoic acid (PFTeDA)	TW23-Ma0042598	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Duplicate									
Perfluoroalkyl sulfonamido substances				Result 1	Result 2	RPD			
Perfluorooctane sulfonamide (FOSA)	TW23-Ma0042598	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	TW23-Ma0042598	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	TW23-Ma0042598	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)	TW23-Ma0042598	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)	TW23-Ma0042598	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	TW23-Ma0042598	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	TW23-Ma0042598	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
Duplicate									
Perfluoroalkyl sulfonic acids (PFSAs)				Result 1	Result 2	RPD			
Perfluorobutanesulfonic acid (PFBS)	TW23-Ma0042598	CP	ug/L	0.01	0.02	6.3	30%	Pass	
Perfluorononanesulfonic acid (PFNS)	TW23-Ma0042598	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluoropropanesulfonic acid (PFPrS)	TW23-Ma0042598	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluoropentanesulfonic acid (PFPeS)	TW23-Ma0042598	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorohexanesulfonic acid (PFHxS)	TW23-Ma0042598	CP	ug/L	0.04	0.04	4.1	30%	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	TW23-Ma0042598	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorooctanesulfonic acid (PFOS)	TW23-Ma0042598	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorodecanesulfonic acid (PFDS)	TW23-Ma0042598	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	

Duplicate								
n:2 Fluorotelomer sulfonic acids (n:2 FTSA)				Result 1	Result 2	RPD		
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	TW23-Ma0042598	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)	TW23-Ma0042598	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	TW23-Ma0042598	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	TW23-Ma0042598	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass
Duplicate								
Perfluoroalkyl carboxylic acids (PFCA)				Result 1	Result 2	RPD		
Perfluorobutanoic acid (PFBA)	TW23-Ma0042599	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass
Perfluoropentanoic acid (PFPeA)	TW23-Ma0042599	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass
Perfluorohexanoic acid (PFHxA)	TW23-Ma0042599	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass
Perfluoroheptanoic acid (PFHpA)	TW23-Ma0042599	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass
Perfluorooctanoic acid (PFOA)	TW23-Ma0042599	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass
Perfluorononanoic acid (PFNA)	TW23-Ma0042599	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass
Perfluorodecanoic acid (PFDA)	TW23-Ma0042599	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass
Perfluoroundecanoic acid (PFUnDA)	TW23-Ma0042599	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass
Perfluorododecanoic acid (PFDoDA)	TW23-Ma0042599	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass
Perfluorotridecanoic acid (PFTrDA)	TW23-Ma0042599	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass
Perfluorotetradecanoic acid (PFTeDA)	TW23-Ma0042599	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass
Duplicate								
Perfluoroalkyl sulfonamido substances				Result 1	Result 2	RPD		
Perfluorooctane sulfonamide (FOSA)	TW23-Ma0042599	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	TW23-Ma0042599	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	TW23-Ma0042599	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)	TW23-Ma0042599	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)	TW23-Ma0042599	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	TW23-Ma0042599	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	TW23-Ma0042599	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass
Duplicate								
Perfluoroalkyl sulfonic acids (PFSA)				Result 1	Result 2	RPD		
Perfluorobutanesulfonic acid (PFBS)	TW23-Ma0042599	CP	ug/L	0.02	0.02	18	30%	Pass
Perfluorononanesulfonic acid (PFNS)	TW23-Ma0042599	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass
Perfluoropropanesulfonic acid (PFPrS)	TW23-Ma0042599	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass
Perfluoropentanesulfonic acid (PFPeS)	TW23-Ma0042599	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass

Duplicate								
Perfluoroalkyl sulfonic acids (PFSAs)				Result 1	Result 2	RPD		
Perfluorohexanesulfonic acid (PFHxS)	TW23-Ma0042599	CP	ug/L	0.01	0.01	13	30%	Pass
Perfluoroheptanesulfonic acid (PFHpS)	TW23-Ma0042599	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass
Perfluorooctanesulfonic acid (PFOS)	TW23-Ma0042599	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass
Perfluorodecanesulfonic acid (PFDS)	TW23-Ma0042599	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass
Duplicate								
n:2 Fluorotelomer sulfonic acids (n:2 FTSA)				Result 1	Result 2	RPD		
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	TW23-Ma0042599	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)	TW23-Ma0042599	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	TW23-Ma0042599	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	TW23-Ma0042599	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).
Q09	The Surrogate recovery is outside of the recommended acceptance criteria due to matrix interference. Acceptance criteria were met for all other QC

Authorised by:


Analytical Services Manager

Senior Analyst-PFAS

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 or please [click here](#).

Eurofins shall not be liable for loss, cost, damages or expenses incurred by the client, or any other person or company, resulting from the use of any information or interpretation given in this report. In no case shall Eurofins be liable for consequential damages including, but not limited to, lost profits, damages for failure to meet deadlines and lost production arising from this report. This document shall not be reproduced except in full and relates only to the items tested. Unless indicated otherwise, the tests were performed on the samples as received.

Eurofins Environment Testing Australia Pty Ltd

ABN: 50 005 085 521

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Eurofins ARL Pty Ltd

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Sample Receipt Advice

Company name:	[REDACTED]
Contact name:	[REDACTED]
Project name:	QLD_0229
Project ID:	QLD_0229_PFSASOMP_23
Turnaround time:	5 Day
Date/Time received	Mar 17, 2023 2:35 PM
Eurofins reference	972979

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.
- ✗ Split sample sent to requested external lab.
- ✗ Some samples have been subcontracted.
- N/A** Custody Seals intact (if used).

Notes

Sample ID 0229_QC206 as per COC is labelled as 0229_QC205 on sample container.

Contact

If you have any questions with respect to these samples, please contact your Analytical Services Manager:

[REDACTED]

Results will be delivered electronically via [REDACTED]

Note: A copy of these results will also be delivered to the general [REDACTED]

Appendix F

Calibration Certificates

ANZ

FQM - Water Quality Meter Calibration Record

Q4AN(EV)-410-FM1

Project Name:	PFAS OMP	Project Number:	606 12487
Project Location:	LAVALACK TSU	Client:	DEFENCE
PM Name:	[REDACTED]	Fieldwork Staff Name:	[REDACTED]

This calibration record is intended to prompt fieldwork staff to calibrate water quality meter (WQM) daily before the start of fieldwork.

INSTRUMENT DETAILS

Supplier:	AIRMET
Make and Model:	YSI PROFESSIONAL
Serial Number:	18 J104 327

CALIBRATION

CALIBRATE WITH CALIBRATION SOLUTIONS

Date and Time:	06 MAR 23 0742				
Parameter	Acidity		Conductivity	Dissolved Oxygen	
Units	pH 7	pH 4	µS/cm	(MV) ppm ORP	ppm %O
Calibration Standard Concentration:	7	4	2796	240	100
Calibration Reading:	7.22	4.14	2649	241	94.9
Calibration Temperature:	10.1°	10.8°	20.2°	19	21.1

ONGOING CHECKS

BUMP TEST WITH CALIBRATION SOLUTION

Date and Time:					
Parameter	Acidity		Conductivity	Dissolved Oxygen	
Units	pH	pH	µS/cm	ppm	ppm
Calibration Standard Concentration:					
Bump Test Reading:					
Bump Test Temperature:					

COMMENTS

Detail any equipment faults, minor maintenance performed, change of batteries or technical support provided.

Approval and Distribution

Each individual instrument inspected and calibrated daily and bump tested as required by fieldwork staff.

 Staff Signature 06 MAR 23 Date

Distribution: Project Central File

FQM - Water Quality Meter Calibration Record

Q4AN(EV)-410-FM1

Project Name:	PEAS OMP	Project Number:	60612487
Project Location:	LAVALACK TSU	Client:	DEFENCE.
PM Name:	[REDACTED]	Fieldwork Staff Name:	[REDACTED]

This calibration record is intended to prompt fieldwork staff to calibrate water quality meter (WQM) daily before the start of fieldworks.

INSTRUMENT DETAILS

Supplier:	AIRMET
Make and Model:	YSI PROFESSIONAL
Serial Number:	1BK102334

CALIBRATION

CALIBRATE WITH CALIBRATION SOLUTIONS

Date and Time:	06 MAR 23 0742				
Parameter	Acidity		Conductivity	Dissolved Oxygen	
Units	pH 7	pH 4	µS/cm	MV AND ORP	ppm %
Calibration Standard Concentration:	7	4	2500	240	100
Calibration Reading:	7.03	4.10	2987	241.5	99.3
Calibration Temperature:	10.7°	10.8	19.2/1.8	19.2	20.1

NOTE/REMARKS

BUMP TEST WITH CALIBRATION SOLUTION

Date and Time:					
Parameter	Acidity		Conductivity	Dissolved Oxygen	
Units	pH	pH	µS/cm	ppm	ppm
Calibration Standard Concentration:					
Bump Test Reading:					
Bump Test Temperature:					

COMMENTS

Detail any equipment faults, minor maintenance performed, change of batteries or technical support provided.

[Empty space for comments]

Approval and Distribution

Each individual [REDACTED] has been inspected and calibrated daily and bump tested as required by fieldwork staff.

[REDACTED] Staff Signature 06 MAR 23 Date

Distribution: Project Central File

Date

ANZ

FQM - Water Quality Meter Calibration Record

Q4AN(EV)-410-FM1

Project Name:	PFAS OMP - LAVARACK	Project Number:	10612847 3)
Project Location:	ANDAMORAI BAY	Client:	PT. ... NCE
PM Name:	[REDACTED]	Fieldwork Staff Name:	[REDACTED]

This calibration record is intended to prompt fieldwork staff to calibrate water quality meter (WQM) daily before the start of fieldworks.

INSTRUMENT DETAILS

Supplier:	AECOM
Make and Model:	YSI Pro.D55
Serial Number:	15K102334

CALIBRATION

CALIBRATE WITH CALIBRATION SOLUTIONS

Date and Time:	7/3/23 12:50				
Parameter	Acidity		Conductivity	Dissolved Oxygen	
Units	pH	pH	µS/cm	ppm	ppm %
Calibration Standard Concentration:	7.00	4.00	2760	225.7	99.5
Calibration Reading:	7.07	3.97	2888	270.8	100.9
Calibration Temperature:	29.2	29.0	29.1	29.1	30.9

DOING AND CHECKS

BUMP TEST WITH CALIBRATION SOLUTION

Date and Time:					
Parameter	Acidity		Conductivity	Dissolved Oxygen	
Units	pH	pH	µS/cm	ppm	ppm
Calibration Standard Concentration:					
Bump Test Reading:					
Bump Test Temperature:					

Detail any equipment faults, minor maintenance performed, change of batteries or technical support provided.

Approval and Distribution

Each individual instrument is calibrated daily and bump tested as required by fieldwork staff.

 Date: 7/3/23

Distribution: Project Central File

011 - BASE LOW 7/3/23

ANZ

FQM - Water Quality Meter Calibration Record

Q4AN(EV)-410-FM1

Project Name:	RFAS OMP	Project Number:	0612487
Project Location:	Lavaraok	Client:	DoD
PM Name:	[Redacted]	Fieldwork Staff Name:	[Redacted]

This calibration record is intended to prompt fieldwork staff to calibrate water quality meter (WQM) daily before the start of fieldworks.

INSTRUMENT DETAILS

Supplier:	Y81
Make and Model:	PROFESSIONAL PLUS
Serial Number:	182104327

CALIBRATION

CALIBRATE WITH CALIBRATION SOLUTIONS

Date and Time:	8/3/23			
Parameter	Acidity		Conductivity	Dissolved Oxygen
Units	pH	pH	µS/cm	ppm
Calibration Standard Concentration:		4		
Calibration Reading:		7.01		
Calibration Temperature:		26.2		

ONGOING CHECKS

BUMP TEST WITH CALIBRATION SOLUTION

Date and Time:	8/3/23 05:00				
Parameter	Acidity		Conductivity	Dissolved Oxygen	
Units	pH	pH	µS/cm	ppm	%
Calibration Standard Concentration:	7	4	2460	229	100%
Bump Test Reading:	6.93	3.68	2932	229.1	98.6
Bump Test Temperature:	26.1	26.2	25.9	26.3	26.1

NOTES

Detail any equipment faults, minor maintenance performed, change of batteries or technical support provided.

[Empty space for notes]

Approval and Distribution

Each individual instrument has been inspected and calibrated daily and bump tested as required by fieldwork staff.

[Redacted Signature] _____ Date 8/3/23

Distribution: Project Central File

ANZ

FQM - Water Quality Meter Calibration Record

Q4AN(EV)-410-FM1

Project Name:	PFAS OM	Project Number:	60612487
Project Location:	Lavarack	Client:	DOD
PM Name:	[Redacted]	Fieldwork Staff Name:	[Redacted]

This calibration record is intended to prompt fieldwork staff to calibrate water quality meter (WQM) daily before the start of fieldworks.

INSTRUMENT DETAILS

Supplier:	
Make and Model:	YSI Pro OSS
Serial Number:	18K102334

CALIBRATION

CALIBRATE WITH CALIBRATION SOLUTIONS

Date and Time:	8/3/23 0715			
Parameter	Acidity		Conductivity	Dissolved Oxygen
Units	pH	pH	µS/cm	ppm ppm
Calibration Standard Concentration:				
Calibration Reading:				
Calibration Temperature:				

DROPTIME CHECKS

BUMP TEST WITH CALIBRATION SOLUTION

Date and Time:	8/3/23 0715			
Parameter	Acidity		Conductivity	ORP Dissolved Oxygen
Units	pH	pH	µS/cm	mV ppm ppm
Calibration Standard Concentration:	4	7	2760	229
Bump Test Reading:	3.98	7.02	2765	228.9
Bump Test Temperature:	26.5	26.5	26.1	26.2

REMARKS

Detail any equipment faults, minor maintenance performed, change of batteries or technical support provided.

[Large empty area for remarks]

Approval and Distribution

Each individual instrument has been inspected and calibrated daily and bump tested as required by fieldwork staff.

Fieldwork Staff: [Redacted] Date: 8/3/23

Distribution: Project Central File

ANZ

FQM - Water Quality Meter Calibration Record

Q4AN(EV)-410-FM1

Project Name:	PFA OMP	Project Number:	66-12487
Project Location:	Lanewark	Client:	DOO
PM Name:	[Redacted]	Fieldwork Staff Name:	[Redacted]

This calibration record is intended to prompt fieldwork staff to calibrate water quality meter (WQM) daily before the start of fieldwork.

INSTRUMENT DETAILS

Supplier:	YSI
Make and Model:	Professional Plus
Serial Number:	18210432

CALIBRATION

CALIBRATE WITH CALIBRATION SOLUTIONS

Date and Time:	9/3/23				
Parameter	Acidity		Conductivity	Dissolved Oxygen %	
Units	pH	pH	µS/cm	ppm	ppm
Calibration Standard Concentration:	7	4.01	2760	229	100
Calibration Reading:	7.17	4.02	3080	227	97
Calibration Temperature:	26.9	26.9	27.1	27.3	27.0

PENDING CHECKS

BUMP TEST WITH CALIBRATION SOLUTION

Date and Time:					
Parameter	Acidity		Conductivity	Dissolved Oxygen	
Units	pH	pH	µS/cm	ppm	ppm
Calibration Standard Concentration:					
Bump Test Reading:					
Bump Test Temperature:					

REMARKS

Detail any equipment faults, minor maintenance performed, change of batteries or technical support provided.

[Large empty area for handwritten notes]

Approval and Distribution

Each individual instrument has been inspected and calibrated daily and bump tested as required by fieldwork staff.

_____ 9/3/23
 _____ Date

Distribution: Project Central File

ANZ

FQM - Water Quality Meter Calibration Record

Q4AN(EV)-410-FM1

Project Name:	PFAS OMP	Project Number:	60612487
Project Location:	LAV TSV	Client:	DEFENCE
PM Name:	[REDACTED]	Fieldwork Staff Name:	[REDACTED]

This calibration record is intended to prompt fieldwork staff to calibrate water quality meter (WQM) daily before the start of fieldworks.

INSTRUMENT DETAILS

Supplier:	YSI
Make and Model:	DIGITAL PROFESSIONAL SERIES
Serial Number:	18K 102334

CALIBRATION

CALIBRATE WITH CALIBRATION SOLUTIONS

Date and Time:	09/03/23				
Parameter	Acidity		Conductivity	Dissolved Oxygen	
Units	pH 7	pH 4	µS/cm	ORP µmV	ppm %
Calibration Standard Concentration:	7	4 1000	2760	229	100
Calibration Reading:	7.05	3.97	2784	228.2	99.2
Calibration Temperature:	26.8	26.9	26.5	26.2	26.9

PENDING CHECKS

BUMP TEST WITH CALIBRATION SOLUTION

Date and Time:					
Parameter	Acidity		Conductivity	Dissolved Oxygen	
Units	pH	pH	µS/cm	ppm	ppm
Calibration Standard Concentration:					
Bump Test Reading:					
Bump Test Temperature:					

COMMENTS

Detail any equipment faults, minor maintenance performed, change of batteries or technical support provided.

[Empty space for comments]

Approval and Distribution

Each individual instrument has been inspected and calibrated daily and bump tested as required by fieldwork staff.

[REDACTED] Staff Signature

09/03/23 Date

Distribution: Project Central File

ANZ

FQM - Water Quality Meter Calibration Record

Q4AN(EV)-410-FM1

Project Name:	IFA OMP - LA	Project Number:		
Project Location:	WINDY RIVER	Client:		
PM Name:	[REDACTED]	Fieldwork Staff Name:	[REDACTED]	
This calibration record is intended to prompt fieldwork staff to calibrate water quality meter (WQM) daily before the start of fieldworks.				
INSTRUMENT DETAILS				
Supplier:	AECOM			
Make and Model:	I DS			
Serial Number:				
CALIBRATION				
CALIBRATE WITH CALIBRATION SOLUTIONS				
Date and Time:	2018/05/01			
Parameter	Acidity		Conductivity	ORP / Dissolved Oxygen
Units	pH	pH	µS/cm	mV - ppm - ppm %
Calibration Standard Concentration:	7.00	4.01	2760	233.1 100%
Calibration Reading:	6.96	3.93	31.05	220.4 220.4 102.9
Calibration Temperature:	20.1	30.9	2895.2	31 3 1
ONGOING CHECKS				
BUMP TEST WITH CALIBRATION SOLUTION				
Date and Time:				
Parameter	Acidity		Conductivity	Dissolved Oxygen
Units	pH	pH	µS/cm	ppm ppm
Calibration Standard Concentration:				
Bump Test Reading:				
Bump Test Temperature:				
COMMENTS				
Detail any equipment faults, minor maintenance performed, change of batteries or technical support provided.				
Approval and Distribution				
<input checked="" type="checkbox"/> Each individual instrument has been inspected and calibrated daily and bump tested as required by fieldwork staff.				
Fieldwork Staff Signature			Date	
Distribution: Project Central File				

Oil / Water Interface Meter

Instrument **Interface Meter (60M)**
Serial No. **483919**

Air-Met Scientific Pty Ltd
 1300 137 067

Item	Test	Pass	Comments
Battery	Compartment	✓	
	Capacity	✓	
Probe	Cleaned/Decon.	✓	
	Operation	✓	
Connectors	Condition	✓	
		✓	
Tape Check	Cleaned	✓	
	Checked for cuts	✓	
Instrument Test	At surface level	✓	

Certificate of Calibration

This is to certify that the above instrument has been cleaned and tested.

Calibrated by: _____

Calibration date: **17-Feb-23**

Next calibration due: **17/08/2023**

Oil / Water Interface Meter

Instrument **Interface Meter (30M)**
Serial No. **349173**

Air-Met Scientific Pty Ltd
 1300 137 067

Item	Test	Pass	Comments
Battery	Compartment	✓	
	Capacity	✓	
Probe	Cleaned/Decon.	✓	
	Operation	✓	
Connectors	Condition	✓	
Tape Check	Cleaned	✓	
	Checked for cuts	✓	
Instrument Test	At surface level	✓	

Certificate of Calibration

This is to certify that the above instrument has been cleaned and tested.

Calibrated by: _____

Calibration date: **28/02/2023**

Next calibration due: **28/08/2023**

Multi Parameter Water Meter



Instrument **YSI Quatro Pro Plus**
Serial No. **18J104327**

Air-Met Scientific Pty Ltd
1300 137 067

Item	Test	Pass	Comments
Battery	Charge Condition	✓	
	Fuses	✓	
	Capacity	✓	
Switch/keypad	Operation	✓	
	Display		
	Intensity	✓	
	Operation (segments)	✓	
Grill Filter	Condition	✓	
	Seal	✓	
PCB	Condition	✓	
Connectors	Condition	✓	
Sensor	1. pH	✓	
	2. mV	✓	
	3. EC	✓	
	4. D.O	✓	
	5. Temp	✓	
Alarms	Beeper		
	Settings		
Software	Version		
Data logger	Operation		
Download	Operation		
Other tests:			

Certificate of Calibration

This is to certify that the above instrument has been calibrated to the following specifications:

Sensor	Serial no	Standard Solutions	Certified	Solution Bottle Number	Instrument Reading
1. pH 7.00		pH 7.02		393774	pH 7.02
2. pH 4.00		pH 4.00		329384	pH 4.00
3. ORP		237.14mV		385070/387761	237.1mV
4. EC		1413uS		385789	1415uS
5. D.O		0%		Fresh Air	0.00%
6. Temp		21.3		MultiTherm 09000528	21.3

Calibrated by: [REDACTED]

Calibration date: **28-Feb-23**

Next calibration due: **28/08/2023**